YAMAHA

Loopfactory

DX200

DESKTOP CONTROL SYNTHESIZER / FM Synthesis
BOITIER CONTROLEUR DE SYNTHESE

DX200

Owner's Manual
Bedienungsanleitung
Mode d'emploi

Congratulations and thank you for purchasing the Yamaha DX200 Desktop Control Synthesizer!

The DX200 is a combination tone generator and sequencer that puts an enormous amount of sonic power and real-time performance control in an exceptionally compact and easy-to-use "desktop" package. As one of the Loopfactory group of instruments, it's an amazingly high-quality and versatile tool for loop-based music production. Use it on your gigs, as part of your DJ setup — or as your secret weapon in your studio arsenal.

With eighteen knobs and umpteen switches, many of them "dedicated" — meaning that a control does specifically and ONLY what its name indicates — the DX200 is a synthesizer control freak's dream.

Powering the richly textured and dynamic Voices of the DX200 is the FM Synthesis system — the tone generation method behind the enormously popular DX7. On the DX200, we've combined the bright and harmonically complex digital sound of FM, with the warm and powerful sound-shaping controls of analog synthesizers — to give you the best of both worlds.

Play the exceptionally high-quality digital Voices of the DX200 with full 16-note polyphony — from the built-in keyboard or from a MIDI device. Use the built-in 16-step sequencer to create your own synth and rhythm sequences. And power up the full-featured DX200 Editor on your computer — to tap into ALL the amazing sonic power the DX200 has to offer.

There's a lot of important, helpful information in these pages. So read through this manual carefully — and get the most out of your sophisticated new DX200.

● **Packing List**
The following items have been included with your DX200. Check to see that you have everything listed here.
- Owner's Manual
- CD-ROM
- AC Power Adaptor*
  * Power supply recommendation may vary from country to country. Please check with your nearest Yamaha dealer for further details.

* The company names and product names in this Owner's Manual are the trademarks or registered trademarks of their respective companies.

* The screens as illustrated in this owner's manual are for instructional purposes only, and may appear somewhat different from the ones of your instrument.

Contents

How to Use This Manual

How to USE a manual? Sounds a bit obvious, we admit. ("Open it and read it.") But here goes:

1 Go straight to the Quick Start Guide.

This tells you simply and in no uncertain terms how to set up your new DX200 and get sound out of it.

2 Work through the 93 Tips.

These are practical, no-nonsense applications that get you actually USING the machine.

If this is your first tone generator or synthesizer, fire up the DX200, open up the manual to Tip 1, and go from there. Think of it as a game — the more tips you complete, the better you know the machine, and the sooner you can reach your goal of becoming a true synth wizard. Pay particularly close attention to the Power Hints scattered throughout — they're great for further exploration.

If you have years of experience with synthesizers and know all about cutoff frequency, resonance, algorithms, modulators, LFOs, EGs, and MIDI — and you even dream in hexadecimal — skim through the tips anyway. There's bound to be some interesting and helpful stuff here, no matter what your level of expertise. If you need some pertinent info quickly, check the Tech Talk boxes.

3 Refer to the Appendix when necessary.
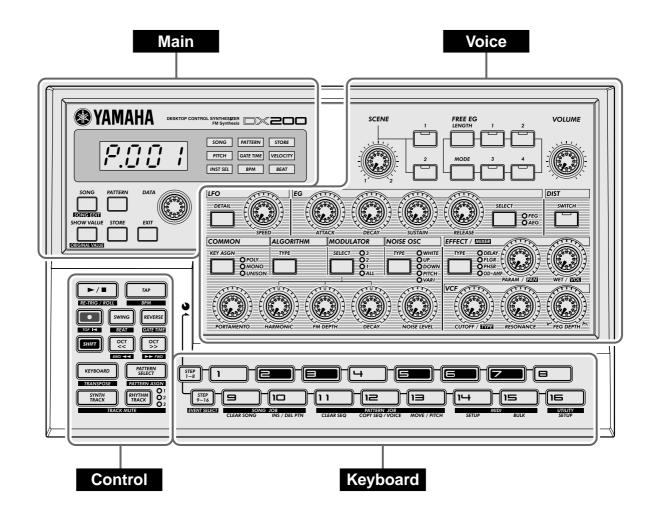
Lots of helpful, convenient information in this section, too. If something doesn't work as expected, go to **Troubleshooting** (page 115). If you want a clear, concise explanation of how the synthesizer of the DX200 works, see **FM Tone Generation** (page 116). If you're not sure where to go for help but you've got a key word in mind, check the **Contents** (page 6) or look through the **Function Index** (page 110).

Have fun!

Panel Controls

Main

Voice

Control

Keyboard

Here's a quick way to get familiar with your DX200! The front (or top) panel of the DX200 can be roughly divided into four sections: Main, Control, Voice, and Keyboard. Look through the controls here, and check out the Tips related to each of them for more information.

> **NOTE** The Tip references by each control are not meant to be comprehensive. They either give the first (or main) Tip in which the control appears, or the group of Tips that are most closely related.

Main

These are the fundamental controls of the DX200 — for changing modes, adjusting values, exiting from functions, and so on.

Display and indicators

Voice

These controls are for editing and changing the sound of the Voices.

Control

For the most part, these buttons are related to the Patterns — especially for controlling record and playback operations.

Keyboard

The Keyboard section has several main uses:
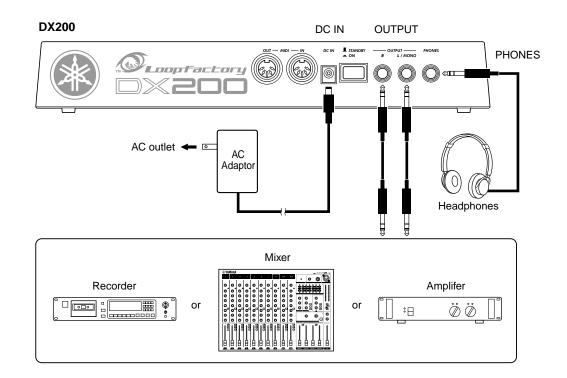
Quick Start Guide

Once that you've got the DX200 out of the box and checked that all included items were indeed included, it's time to set everything up and get playing.

1 Turn the VOLUME control all the way down to the minimum.

2 Connect the OUTPUT jacks (L/MONO and R) to the inputs of your recorder/mixer/amplifier.
If you're using a mono system, use only the L/MONO jack. If you're using headphones, connect them to the PHONES jack.

3 Plug in the included power adaptor – first, one end into the DC IN terminal, then the other into an AC outlet.

4 Turn on the power with the rear panel power switch. Then, turn on the power of your recorder/mixer/amplifier.

> NOTE   The DX200 takes a little time to "warm up" after being turned on – roughly 15 seconds. After the startup routine is finished, your DX200 is ready to play.

5 Press the Start/Stop button on the DX200 to start a Pattern and slowly turn up the VOLUME control until the level is appropriate.
To stop the Pattern, simply press the Start/Stop button again.
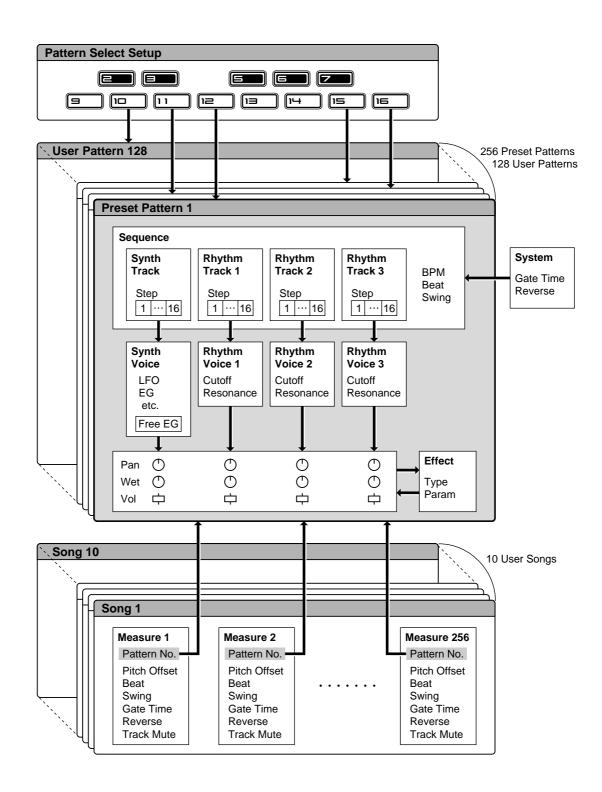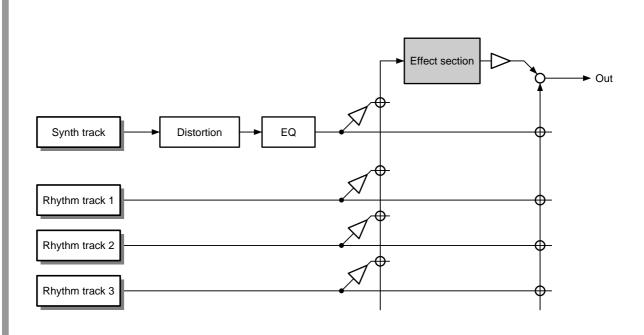
And that's all there is to it. Now go on to the Tips and start playing!

Parameter Structure

This diagram shows the structure and hierarchy of the Songs, Patterns and Voices of the DX200. As you work with the DX200 and explore its various functions and features, refer back to this diagram to see how all the pieces of the puzzle fit together.

| NOTE | The EQ processing is accessible only with the DX200 Editor software. |

This is NOT an owner's manual!

At least not an ordinary one. But, then again, the DX200 is no ordinary instrument. It's packed with exciting, powerful, yet easy-to-use features that give you complete, hands-on sonic control — plus tons of dynamic real-time functions that can bring an extra edge to your live performances!

With all the digital power under this small hood, the DX200 is a stunning new instrument of the future. Yet it also brings you the very best of the old analog world — just look at all those knobs for twisting and tweaking your sound!

We know you don't like reading manuals. But you owe it to yourself to look through this collection of hot tips. They show you how to get the most out of your new DX200 in the shortest time possible.

It's like having an expert programmer take you by the hand and show you the ropes, sharing all the tricks and techniques you need to be a master on the instrument yourself. These tips take you from the bare-bones basics, to advanced power tips that get you pumping out fat sounds and happening tracks — in no time flat!
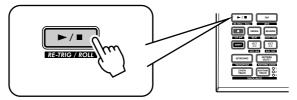
So jump in …

Pattern Basics

Start your synthesizer apprenticeship right here. In this section, you'll learn about playing Patterns, and how to use some of the DX200's powerful tools to change the sound as it's playing.

Tip 1   Playing a Pattern

Here's where all the fun starts — with the pre-programmed Patterns.

Just press the Start/Stop button, and listen to the Pattern play. The Pattern repeats (loops) until you press the button again to stop it.

● What exactly are Patterns?

The Patterns are the basic musical building blocks of the DX200 — they provide an instrument sound (also called a "Voice"), plus a looping phrase using that Voice.

These pre-recorded Patterns give you the rhythmic and melodic foundation you need for laying down tracks — in your own recording or in performance. Keep in mind that you can create your own Patterns as well. (See page 68.)
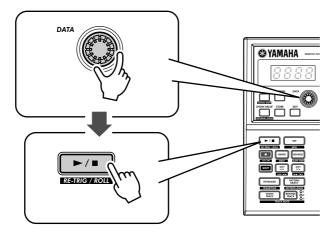
> **Tech talK**
> **Pattern Mode**
>
> Select the Pattern mode by pressing the [PATTERN] button. The letter "P" in the display indicates the Pattern mode.

Tip 2   Exploring other Patterns
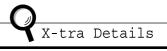
The DX200 features a total of 256 specially pre-programmed Patterns. Try some of these out now.

Use the [DATA] knob to select a different Pattern. Notice how the Pattern number in the display changes. Then press the Start/Stop button to play the Pattern.

You can also change Patterns during playback! Turn the [DATA] knob while the Pattern is playing — the new Pattern starts playing immediately after the previous one is finished.
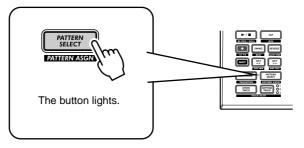
> **X-tra Details**
>
> Keep in mind that you cannot select Voices separate from the Patterns. If you want to hear a certain Voice, select the Pattern containing that Voice. You can copy that Voice to a different Pattern; see Tip 53.

Tip 3   **Switching Patterns on the fly**
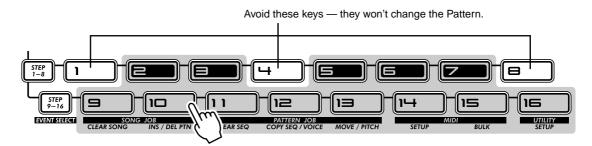
Try mixing it up now. The DX200 lets you change Patterns as easily as pressing a button...

Thanks to the Pattern Select function, you can chain together Patterns in real time from the keyboard — as you perform.

Select a Pattern, then press [PATTERN SELECT].

The button lights.

Start the Pattern. While the Pattern is playing, press one of the keyboard buttons (except 1, 4, and 8).

Avoid these keys — they won't change the Pattern.

Notice how a new Pattern starts playing as soon as the previous one is finished. This is a great way to string together various Patterns in a live performance — and create your own songs on the fly. If you want, you can use the keys to select a Pattern before starting playback as well.

PoWer HintS

- **Repeats**
  Unless you want the same Pattern to repeat several times, don't press a keyboard button more than once. On the other hand, you can quickly program the Pattern sequence for an entire song if you want, without having wait for each Pattern to play back. The DX200 remembers all the buttons you press and how many times you press them, and automatically plays back the Patterns as you programmed — repeats and all.

- **Other octaves, more Patterns**
  Before starting the Pattern, use the [OCT <<]/[OCT >>] buttons to change the octave range of the keys. That'll let you select other Patterns!

- **Assign them yourself**
  The Pattern-to-key assignments have been made for you. However, you can make your own assignments, and put the Patterns you want to use close together for easy access. (See page 40.)
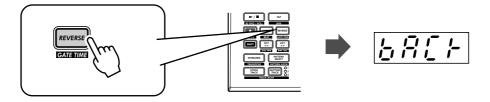
Tip **4** **Playing it backwards**

The Reverse function lets you completely turn the Pattern around, and play all the notes backwards.
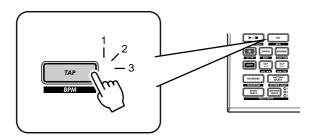
Before you start the Pattern (or during playback, if you want), simply press the [REVERSE] button.

Tip **5** **Changing the bpm**

Now, that you've got a Pattern playing, try changing its speed.   (This is also called "bpm" — beats per minute.) The DX200 gives you two ways to do this — tapping out the speed manually, or using the [DATA] knob to adjust it.

1 Tap the [TAP] button three or four times at the desired speed.

The new bpm is shown in the display. The [TAP] button and BPM lamp flash in time.

2 If you want, adjust the bpm by turning the [DATA] knob.

3 Press the Start/Stop button to start the Pattern at the new bpm.

HINT You can also change the bpm while the Pattern is playing. To do this, simply start the Pattern before step #1 above.

Tech talk

BPM
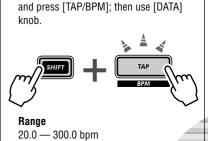
Determines the speed or tempo of a Pattern.

Operation
Use [TAP] button to tap tempo; then adjust with [DATA] knob. Or hold down [SHIFT] and press [TAP/BPM]; then use [DATA] knob.

Range
20.0 — 300.0 bpm
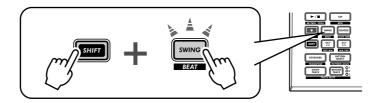
Tip *6*   Messing with the Beat

There's more than one way to mess with the rhythm. Actually, the DX200 gives you a truckload of ways you can disturb and deconstruct your beats. One of these is the (appropriately named) Beat function.

You'll be meeting up with this control again when you record your own Patterns. But let's see how you can use it now to change the feel of a Pattern while it's actually playing...

1 Select a Pattern and start it by pressing the Start/Stop button.

2 While the Pattern is running, hold down [SHIFT] and press [SWING] (BEAT).

Now, you've got Beat called up and ready, so turn the [DATA] knob to change the setting.

You can tell from the lit number buttons how the Pattern is affected. When set to " *16*," all 16 step buttons are lit and all 16 steps play back normally. Change the setting to " *12*," and Steps 13 - 16 drop out. Notice how the Pattern not only slows down but "feels" different, too. Change Beat to "*8*," and you've only got Steps 1 - 8 happening. That's half of the original 16-step Pattern, and naturally, it plays back at half the speed.

Tech talk

Beat
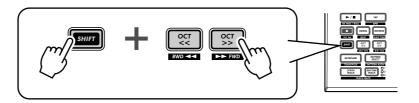
Determines the number of steps in the selected Pattern for playback: 16, 12, or 8. To set, hold [SHIFT] and press [SWING], then use the [DATA] knob.

Range
16, 12, 8 steps

Tip *7*   Double time, half time

Here's a dramatic way to instantly double the speed of a Pattern — or slow it down by one-half.

Simply hold down [SHIFT] and press the [OCT <<] button — just before the beginning of the Pattern — to slow down the bpm by one-half. The first half of the Pattern plays at the new speed, before returning to the original speed.

To double the bpm, hold down [SHIFT] and press the [OCT >>] button just before the top of the Pattern. The Pattern plays back twice at the new speed, then returns to normal.

Song Playback

As we said before, the Patterns are the basic building blocks of the DX200. But what can you build with them?
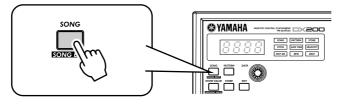
Songs!

Our team of expert programmers has created a few Songs using the various Patterns of the DX200. Check these out and hear just how powerful and versatile the DX200 can be for recording your own material.
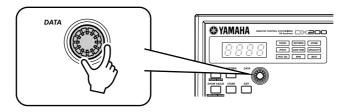
Tip 8 Playing a Song

Let's select a Song now and play it.

1 Press the [SONG] button.
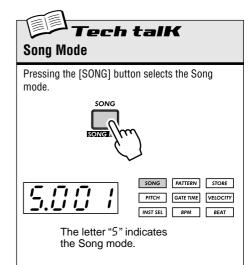
2 Select the desired Song by turning the [DATA] knob.

3 Press the Start/Stop button to play the Song.

For more about Songs and how to create your own, see page 81.

Tech talk

Song Mode

Pressing the [SONG] button selects the Song mode.

The letter "5" indicates the Song mode.

The Keyboard

Small and compact as it is, the DX200 also features a one-octave keyboard for playing and recording the sounds of the instrument.
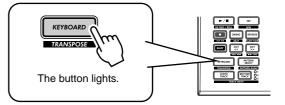
Tip 9 Playing the keyboard
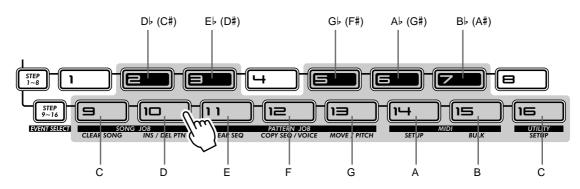
The built-in keyboard is small — just one octave — but it lets you use all the features of the DX200 without having to connect a separate keyboard. Try it out now.

1 Press [KEYBOARD].

The button lights.

2 Play the keyboard.

The buttons give you a full octave, from C to C. Keep in mind that buttons 1, 4, and 8 don't make any sound here — they're not part of the scale.
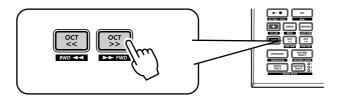
Tip 10 Changing octaves

Naturally, one octave doesn't cover a whole lot of ground. That's why we've included convenient Octave buttons, so you can shift the octave range of the keyboard up or down as needed — quickly and easily.

1 While the [KEYBOARD] button is lit, press [OCT >>].

The display shows "$\mathcal{C}\ \mathcal{4}$," indicating the octave. ("$\mathcal{C}\ \mathcal{3}$" is normal.) Play the keyboard and listen to the sound. Try some other octave settings, pressing [OCT <<] and [OCT >>] as desired to shift the octave.

Tech talk

Octave

Determines the octave range of the built-in keyboard. Press [OCT <<] or [OCT >>] to change. ([DATA] knob can also be used after pressing one of these buttons.) Press both buttons simultaneously to restore normal range. Some notes may not sound for the maximum values.
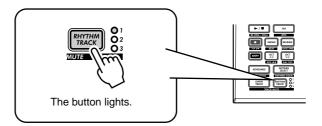
Range
C-2 — C3 (normal) — C8

Tip 11   Playing the Rhythm track

The DX200 also has a special Rhythm track (actually there are three) that let you play and record drum, per-cussion, bass and other sounds — giving you the power to easily create your own ultra-hip beats. Naturally, you can play all these sounds straight from the built-in keyboard...

1 With the [KEYBOARD] button lit, press [RHYTHM TRACK].

The button lights.

Press the button repeatedly to switch among the three Rhythm tracks: 1, 2, and 3.

2 Play the keyboard.
Remember — you can use the [OCT <<]/[OCT >>] buttons to change the range, and call up a whole dif-ferent set of sounds. For more details on how to use the Rhythm tracks, see page 145.
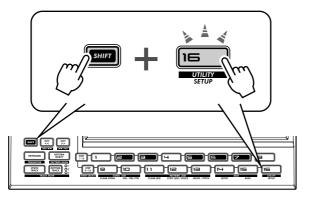
Tip 12   Velocity

All the keys of the built-in keyboard play at a fixed volume — no matter how hard or how soft you play them. However, you can set this fixed volume yourself, and make the sound as soft or as loud as you need it.

This Velocity setting also controls how loud the sounds are, when you record your own Patterns in Real-time recording (page 70).

1 Hold down [SHIFT] and press button [16], repeatedly if necessary, until "ᴸᴱᴸ" appears in the display.

> ### 📖 Tech talk
> **Velocity**
>
> Determines the default Velocity setting for the built-in keyboard of the DX200. This affects the loudness of the Synth and Rhythm track sounds, when played from the keyboard. It also affects the loudness of Real-time recorded tracks, when the built-in keyboard is used to record notes.
>
> Velocity is set in the Utility parameters. Hold down [SHIFT] and press button [16], repeat-edly if necessary, until "ᴸᴱᴸ" appears in the display. Use the [DATA] knob to change the value.
>
> **Range**
> 1 — 127

2 Use the [DATA] knob to change the value.
Make sure the [KEYBOARD] button is lit, and try out different settings.
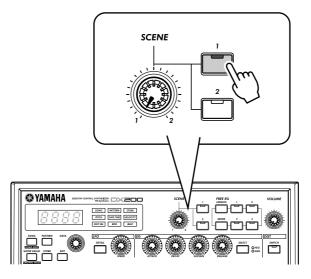
Scene Basics

Scene is one of the most powerful and exciting features of the DX200. It lets you "morph" between two completely different sounds — in real time, as the Pattern is playing.

Tip *13* Switching Scenes

Here we'll switch between Scenes, for instant sound changes.
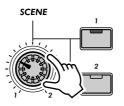
Select a Pattern and start it up. While it's playing, press the SCENE [2] button. Hear how the sound changes? Press SCENE [1] to go back to the first sound. Try to do this on the beat, alternating between the two in rhythm.

Tip *14* Morphing

Let's try something more subtle now. While playing back a Pattern, turn the [SCENE] knob slowly, back and forth.

Notice how the sound gradually "morphs" between 1 and 2 — in real time as you work the knob. Do this in sync with the rhythm and create your own shifting textures.

For more details on Scene, see page 59.

Effects
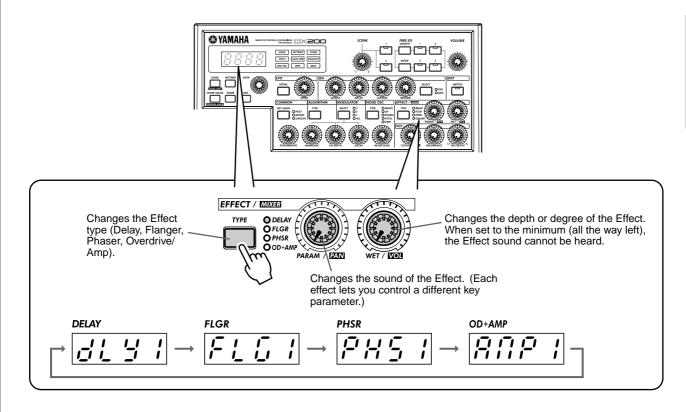
The effects of the DX200 are more than just icing on the cake — they're powerful tools you can use to completely transform the sound, and put your tracks over the top.

Tip 15 What is an Effect?

The Effects are the last element in the sound chain — they are the last bit of processing done to the sound before you hear it.

These real-time Effects — Delay, Flanger, Phaser, Overdrive/Amp — let you mangle the sound in wild and exciting ways. Although it's not in the Effect section, there's also a Distortion effect that lets you add anything from a warm grunge to a full-on metallic assault.

The Effect controls are exceptionally simple and easy to use. Pressing the [TYPE] button changes the Effect type, while the [PARAM] and [WET] knobs let you adjust the sound and depth of the Effect.

Changes the Effect type (Delay, Flanger, Phaser, Overdrive/Amp).

Changes the depth or degree of the Effect. When set to the minimum (all the way left), the Effect sound cannot be heard.

Changes the sound of the Effect. (Each effect lets you control a different key parameter.)

DELAY → FLGR → PHSR → OD+AMP

Tech talk
[WET] knob

Range
0 — 127 (Same for all Effect types.)

Tip **16** **Playing with the Effects**

Let's take a look at each of the Effects, and try applying them to the sound.

Before you begin, set the [WET] knob up to about 2:00 or 3:00.
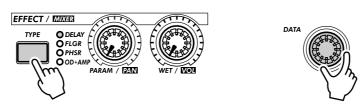
Generally, you should keep the knob at this position. This ensures that you can properly hear the Effect. (Tweak it later as needed to adjust the Effect balance.)

Now, try out each Effect, and use the same procedure:

1 Select the Effect type.
Press the [TYPE] button, then use the [DATA] knob. Thirteen different types are available.

2 Adjust the Effect depth.
Use the [PARAM] knob.

● Delay
(Delay 1 — 3)
Delay is a popular effect that repeats the sound in rhythm. Play a Pattern and select Delay 1 (*dLY1*). Try setting the [PARAM] knob to around 3:00. Hear how the Delay sound pulses with the original sound to create a different, more complex yet "spacier" feel. Try the other Delay types, too.

The key to using Delay effectively (no pun intended) is to keep it in sync with the Pattern. This is a little tricky and may take some practice. Slowly work the [PARAM] knob and listen carefully for changes in the rhythm. Keep in mind, there are no "wrong" or "right" settings here — use your ears to come up with settings that feel good.

● Reverb
Reverb (*rcrb*) is a "hidden" type in the Delay category and it lets you apply an ambient wash of reflections to the sound. Used subtly, it can make your tracks warmer and more natural sounding — as if they were being played in a concert hall. More extreme settings can drench the sound in reverb and produce spacy, other-worldly effects.

Try this out on one of the Patterns. Select the Pattern and play it, then tweak the [PARAM] and [WET] knobs, trying different settings, and hearing how they change the sound. Lower settings result in a shorter reverb time as well as an overall brighter sound. Higher settings produce a longer reverb time and dampen the high frequencies as well for a softer, more muffled sound.

Keep in mind that Reverb — like all the Effects — is applied to all tracks, Synth and Rhythm 1 - 3.

● **Flanger**
(Flanger 1, 2)
This modulation-based Effect produces a "swishing" or "tunneling" sound. Play a Pattern and select Flanger 1 (*FLG 1*).

Take the [PARAM] knob from minimum to maximum, and notice how the sound grows from a subtle sweeping, metallic sound — like a jet airplane taking off — to a virtually pitch-less sonic meltdown.

● **Chorus**
Chorus is another modulation effect ("hidden" in the Flanger category) that adds a subtle warmth and depth to the sound — although you can go for some extreme effects, too.

Try Chorus (*CHor*) out on a Pattern. Play around with the [PARAM] knob, trying different settings — and listen for the changes.

Start out with [PARAM] set to 7:00 (minimum). This is no Chorus modulation at all. Now, bring it up slowly to 8:00, then around 9:00. Hear the modulation working? Doesn't the sound seem more animated? Even fatter?

Try higher settings, as well — going to 12:00, then slowly up to 3:00 and beyond. Notice how the pitch wavers in strange ways — and hear how the sound even brightens up for the highest values.

● **Phaser**
(Phaser 1 - 3)
Another modulation Effect, Phaser is similar to Flanger, but much more subtle. It's perfect for adding some warm animation and movement to the sound.

Play a Pattern and select (*PHS 1*). Set the [PARAM] knob to the minimum (0) and gradually turn it up — and listen to how the modulation enhances the sound. Go on to the other Phaser types as well, for more sonic variations.

● **Overdrive/Amp**
(Amp 1 - 3)
This Effect simulates the overdriven sound of a guitar amp, and lets you apply varying degrees of distortion to the sound. Start a Pattern and try Amp 1 (*AMP 1*), and tweak the [PARAM] knob. Notice how minimum values produce a warm, edgy "bite," while maximum values deliver a full, heavy metal onslaught.

Try all three Overdrive/Amp types — the differences may not be dramatic, but they give you a variety of warm and crunch-laden distortion effects to work with. Some of the Patterns sound especially good with a little grunge...

📖 *Tech talk*

Effect

Effect Type
Allows you to select one of thirteen Effect types for processing the sound of the tracks (Synth and Rhythm 1 - 3). Press the [TYPE] button, then use the [DATA] knob.

Settings
Delay 1 - 3, Reverb, Flanger 1 and 2, Chorus, Phaser 1 - 3, Overdrive/Amp 1 - 3

Parameter (PARAM)
In general, this allows you to control the depth of the Effect. (The actual parameter differs depending on the selected Effect type.) Use the [PARAM] knob to adjust.

Range
0 — 127

Wet
Allows you to control the volume of the Effect — in other words, the wet/dry balance. Use the [WET] knob to adjust.

Range
0 — 127

Tip *17* Distortion

The last tip introduced you to a distortion effect, the Overdrive/Amp types. Here's yet another way to dirty up the sound — Distortion.

Although not strictly part of the Effect section, Distortion is a strong effect in its own right. Compared to the warm Overdrive/Amp Effect types, it has more edge and bite. When applied to many of the DX200's Voices, it is capable of creating very convincing guitar-like distortion effects.

1 Press the DIST [SWITCH] button. (The lamp turns on.)

DIST

SWITCH

2 Adjust the balance with the [DATA] knob.

This lets you mix the "dry" no-Distortion sound with the "wet" Distortion-only sound. Try different settings and hear how they change the sound. Notice how a fully wet "*U63*" results in a very brittle, edgy sound.

📖 *Tech talk*

Distortion

Allows you to apply a distortion effect to the Synth track. (Note that this does not affect any of the Rhythm tracks.) Press the DIST [SWITCH] button to turn Distortion on, then use the [DATA] knob to adjust the dry/wet balance. A value of "*d63*" has only the original, unprocessed sound, while a value of "*U63*" has only the Distortion-processed sound.

Range
d63 (dry) — *d:U* (dry = wet) — *U63* (wet)
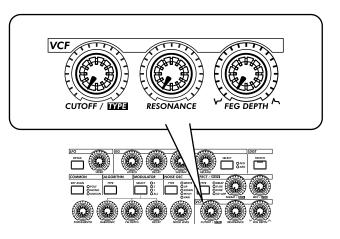
Filter (VCF)

The VCF or Filter section is one of the most powerful and dynamic on the entire instrument. Used in the right way, the VCF controls are capable of transforming sterile, boring sounds into something really dynamic and exciting. Try out the following Tips and see what we mean...
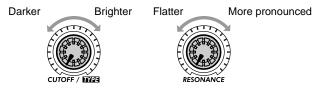
Tip 18 **Cutoff and Resonance**
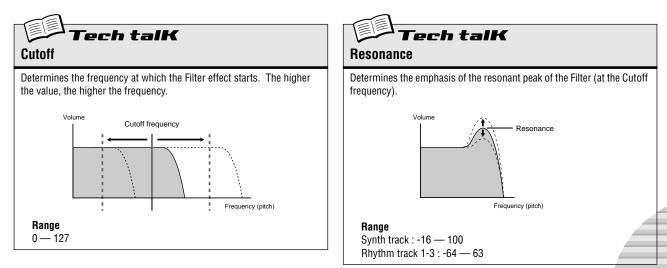
For your Filter explorations, here's the best place to start.

These two Filter controls work interdependently — changing one of them affects the sound of the other.

Turn [CUTOFF] to the left and the sound becomes darker or "muffled." Turn it to the right and the sound becomes brighter. Turn [RESONANCE] to the right and the Filter peak becomes sharper and more pronounced. Turn it to the left and hear how the Filter flattens out.

Also keep in mind that the overall effect of Cutoff and Resonance is controlled by FEG Depth (Tip 20 below). If FEG Depth is set too high or too low, you may hear little or no change in the sound — no matter how furiously you twist the [CUTOFF] and [RESONANCE] knobs.

📖 *Tech talK*

Cutoff

Determines the frequency at which the Filter effect starts. The higher the value, the higher the frequency.

Range
0 — 127

📖 *Tech talK*

Resonance

Determines the emphasis of the resonant peak of the Filter (at the Cutoff frequency).

Range
Synth track : -16 — 100
Rhythm track 1-3 : -64 — 63

27

Tip **19 Wild, wild filter sweeps – VCF Types**

The enormous power and versatility of the Filter section continues with the VCF Types. These hidden varia-
tions put some really heavy-duty sonic fireworks at your fingertips — just what you need to blow the crowd
away.

Try these settings out for size...

**1 Call up a Pattern and press the Start/Stop button. Start out by setting
    both [RESONANCE] and [FEG DEPTH] to around 1:00.**

2 Simultaneously hold down [SHIFT] and turn the [CUTOFF] knob.
Keep your eyes on the display as you do this — the setting will change! For starters, select " *l2db* " —
which should be around 11:00.

In this shifted condition, the [CUTOFF] knob becomes the VCF Type selector. (That's why "TYPE" is
printed in black below the knob.)

**3 Now, take your finger from the [SHIFT] button, and the knob reverts to its
    original identity as the Cutoff control.**
Turn it very slowly — especially between 8:00 and 1:00 — as you listen to the gradual changes in the
sound.

4 Not wild enough for you? Let's move onto another type then...
Hold down [SHIFT] again and turn the [CUTOFF] knob to around 12:00, so that "*bPF*" is called up in the
display.
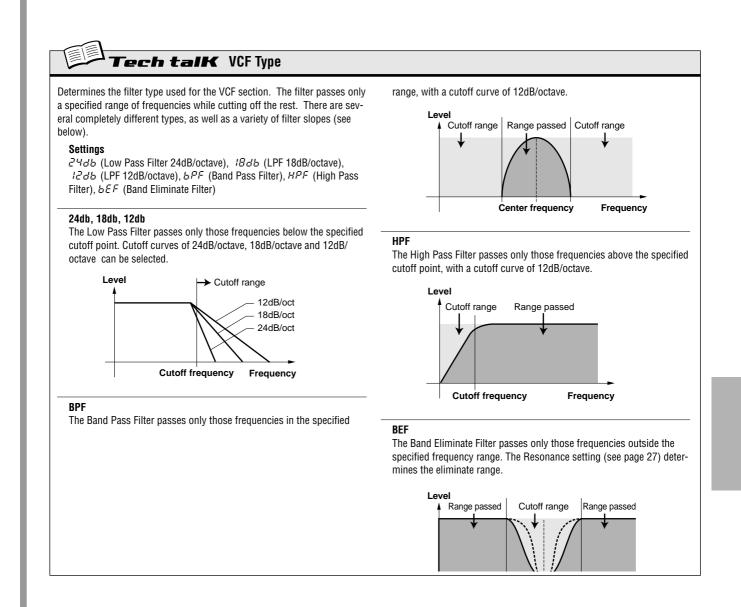
Is that any wilder? Still too tame? Let go of [SHIFT] and try tweaking the [CUTOFF] knob between 8:00
and 2:00.

**5 Let's try one more. Hold [SHIFT] and set the [CUTOFF] knob to around
    2:00, so that the "*HPF*" type is selected.**

Things can get kind of crazy here, too. Tweak the [CUTOFF] knob some more — especially between
12:00 and 3:00 — and hear what kind of madness you can generate.

PoWer HintS
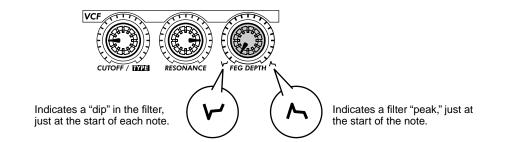
Don't forget the [RESONANCE] and [FEG DEPTH] knobs! Work with them too as you tweak the
[CUTOFF] knob. There's a lot of sonic variation to be had in just these three controls.

Tech talk VCF Type

Determines the filter type used for the VCF section. The filter passes only a specified range of frequencies while cutting off the rest. There are several completely different types, as well as a variety of filter slopes (see below).

Settings
24db (Low Pass Filter 24dB/octave), *18db* (LPF 18dB/octave), *12db* (LPF 12dB/octave), *bPF* (Band Pass Filter), *HPF* (High Pass Filter), *bEF* (Band Eliminate Filter)

24db, 18db, 12db
The Low Pass Filter passes only those frequencies below the specified cutoff point. Cutoff curves of 24dB/octave, 18dB/octave and 12dB/octave can be selected.

BPF
The Band Pass Filter passes only those frequencies in the specified range, with a cutoff curve of 12dB/octave.

HPF
The High Pass Filter passes only those frequencies above the specified cutoff point, with a cutoff curve of 12dB/octave.

BEF
The Band Eliminate Filter passes only those frequencies outside the specified frequency range. The Resonance setting (see page 27) determines the eliminate range.

Tip 20 **FEG Depth**

Technically, the FEG Depth controls how the Filter works over time. This is even shown on the panel for you:

Indicates a "dip" in the filter, just at the start of each note.

Indicates a filter "peak," just at the start of the note.

With the the [CUTOFF] and [RESONANCE] knobs set respectively to 9:00 and 3:00 (see above), slowly turn the [FEG DEPTH] knob.

Depending on the Pattern selected, negative settings (setting the knob left of 12:00) may result in little or no sound. But once you turn the knob past the halfway point (12:00), you'll start to hear the filter "opening up." Turn the knob slowly for gradual filter sweep effects. Also try working the knob in time with the rhythm for dynamic "wah" effects.

Tech talk

FEG Depth

Determines the degree or depth of the filter effect over time. Positive values result in a normal EG; negative values use a "reverse" EG — producing a filter sweep effect that dips and comes back up, rather than one that peaks and goes down.

Range
-64 — 63

Nuts and Bolts

Let's take a break from the fun and games for a moment. Check out the following functions and familiarize yourself with them — they're very useful, convenient tools you'll need as you work with the DX200.

Tip *21*   Show Value

Sometimes you'll want to see what value a knob or button has been set to. Remember that when you call up different Patterns, the knobs won't correspond to the settings, so just looking at the knobs won't help. And if you turn the knob or press the button, you're likely to change the setting. What's a poor knob twister to do?
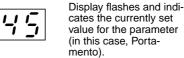
Use the Show Value function. This convenient tool lets you see virtually any of the Voice-related settings — without disturbing or changing them.

1 While you're editing the Voice of a Pattern, press the [SHOW VALUE] button.
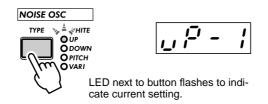
2 Simply turn the knob of the parameter whose value you'd like to see.
For example, to see the Portamento Time value that's been set for the Voice, turn the [PORTAMENTO] knob.

Display flashes and indicates the currently set value for the parameter (in this case, Portamento).
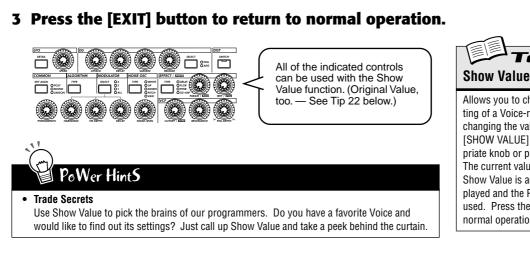
Naturally, Show Value can be used with all Voice-related buttons as well. For example, to see the current setting of the NOISE OSC TYPE, press the NOISE OSC [TYPE] button.

LED next to button flashes to indicate current setting.

For buttons that have multiple parameters (such as LFO [DETAIL] or FREE EG [MODE]), press the button repeatedly to call up the desired parameter.

3 Press the [EXIT] button to return to normal operation.

All of the indicated controls can be used with the Show Value function. (Original Value, too. — See Tip 22 below.)

📖 Tech talk

Show Value

Allows you to check the current value or setting of a Voice-related parameter, without changing the value or setting. Press the [SHOW VALUE] button, then turn the appropriate knob or press the appropriate button. The current value/setting is displayed. While Show Value is active, the Voice cannot be played and the Pattern controls cannot be used. Press the [EXIT] button to return to normal operation.

💡 PoWer HintS

• **Trade Secrets**
Use Show Value to pick the brains of our programmers. Do you have a favorite Voice and would like to find out its settings? Just call up Show Value and take a peek behind the curtain.
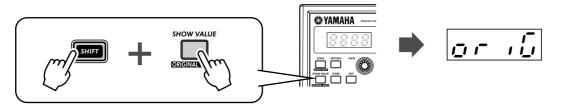
Tip *22* Original Value

If you tweak and turn the knobs on a Voice for any length of time, you're going to come up with a Voice that's VERY different from the one you started out with. And at some point in the editing process, you might wish you could take a peek at the original settings — without erasing your new ones, of course — just to see how far you've strayed.

This is where the Original Value function can help. Similar to Show Value (in Tip 21 above), Original Value lets you view any of the originally programmed Voice-related settings — simply by turning a knob or pressing a button.

1 While you're editing the Voice of a Pattern, hold down [SHIFT] and press the [ORIGINAL VALUE] button.

2 Turn the knob or press the button of the parameter whose value or setting you'd like to see.
For example, to see the original Cutoff value that's been set for the Voice, turn the [CUTOFF] knob.

Display flashes and indicates the originally set value for the parameter (in this case, Cutoff).

Original Value can be used with all the same knobs and buttons as Show Value. For details, see Tip 21 above.

3 Press the [EXIT] button to return to normal operation.

● **What's the difference between Original Value and Show Value?**
   • **Show Value —** Lets you view the CURRENT settings of the Voice.
   • **Original Value —** Lets you view the ORIGINAL PRESET PROGRAMMED settings of the Voice.

If you haven't done any editing to a Voice, both of these will display the same values — those of the currently selected Pattern.

PoWer HintS

• **Closer to home**
  While you're editing a Voice, you may find yourself way off course — somewhere in outer space! You can use Original Value to retrace some of your steps and come back closer to Earth. For example, call up Original Value and check one of the settings — say, FEG DEPTH — then press [EXIT] and adjust the [FEG DEPTH] knob to bring the value closer to the original. Keep doing this with other parameters as well, until you get the sound you want.

• **Current and original values**
  Want to easily see how far your edited values are from the original? Just switch between Show Value and Original Value. To alternate between the two functions, simply press the appropriate button(s): [SHOW VALUE] for Show, [SHIFT] and [ORIGINAL VALUE] for Original. No need to exit beforehand — just toggle between the two, turning the knob each time you switch to check the settings.

Tech talK
Original Value

Allows you to check the originally programmed value or setting of a Voice-related parameter, without changing the value or setting. Hold [SHIFT] and press the [ORIGINAL VALUE] button, then turn the appropriate knob or press the appropriate button. The original value/setting is displayed. While Original Value is active, the Voice cannot be played and the Pattern controls cannot be used. Press the [EXIT] button to return to normal operation.

Tip 23 Panic! (or "Uh-oh...What do I do now?")

As you've undoubtedly discovered by now, the DX200 is a wonderfully deep and extraordinarily versatile synthesizer. Sonically, it can take you places you've never dreamed of.

Unfortunately, that can be part of the problem. While you're tweaking a Voice, you may end up drifting in a synthesized never-never land, or come across nothing but silence or muffled noises, or — maybe worst of all — meet up face to face with a monster sound that can't be tamed.

Until you know exactly how the controls work and how they affect the sound, you'll ocassionally find the DX200 to be an unpredictable, sometimes uncontrollable beast. Before you unplug it and try to stuff it back in its box, try these common-sense workarounds and solutions.

● **Select a different Pattern.**
   Or select the same Pattern again. Yes, this will automatically erase any edits you've made. But at least you can come back to square one and start over.

● **Press the [EXIT] button.**
   This won't always work as you expect. Keep in mind, [EXIT] is mainly used to leave a function or operation. Use it when you find yourself inadvertently doing something you don't really want to do — such as deleting a Pattern from a Song (page 88) or clearing a sequence (page 68). Also use it to get out of situations where there is no sound or many buttons just don't seem to work — such as in Show Value (page 31) or Original Value (page 32).

● **Turn off the power.**
   When all else fails... Actually, we don't recommend doing this, especially if you've got speakers connected. But it IS a quick and sure way to reset everything.

● **Do a Factory Reset operation. (See Tip 24.)**

Use this only if you suspect something is actually wrong with the DX200. (For the most part, many of the confusing things about the instrument may just be things that you don't quite understand yet.) Remember, this will COMPLETELY ERASE any original work you've done or saved — so be careful!

● **Check the Troubleshooting section (page 115).**

We mean it. The next time you find yourself scratching your head (or tearing your hair out), save yourself a whole lot of grief and read through this section. It'll make you feel better.

Tip *24* Factory Reset
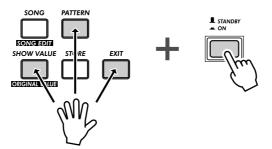
If the DX200 freezes in an operation, crashes, or otherwise behaves erratically, the Factory Reset operation can usually be counted on to bring things back to normal.

Factory Reset is also used to restore all the factory-programmed Pattern and Song data. For example, if you've created your own Pattern and Song data (and saved it, of course) but want to use the original Patterns and Songs of the DX200, just perform a Factory Reset.

⚠ *CAUTION*

This operation automatically erases any and all of your original Patterns and Songs. If possible, make sure to save any important data (page 108) before using Factory Reset.

1 Turn the power off.

2 Simultaneously hold down the [SHOW VALUE], [PATTERN] and [EXIT] buttons, and turn on the power again.

Pattern Playback
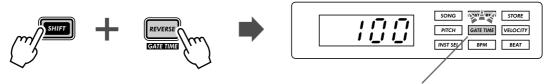
We're going to pick up where we left off in Chapter 1, and give you some more Pattern Tips. These are simple things you can do to change the sound, pitch, rhythmic feel, and other aspects of the Patterns — even the Patterns themselves — in real time.

Tip 25 Adjusting the Gate Time

Try this simple, fast and cool tool — and change the feel of your tracks.

Select and start a Pattern. Any Pattern will do.

While the Pattern is playing, simultaneously hold down [SHIFT] and press [GATE TIME] ([REVERSE]).

This lamp flashes to indicate Gate Time is active.

Turn the [DATA] knob to change the Gate Time. Notice how the length of the notes changes as you work the knob.

When you're done, don't forget to press [EXIT] (or [SHIFT] + [GATE TIME]) to leave the function.

📖 **Tech talk**

Gate Time

Determines the length of each note. The higher the value, the longer the gate time. Shorter values produce a clipped sound, longer ones produce a sustained sound.

Range
1 — 100 (normal) — 200

Tip *26* **Transposing the key**
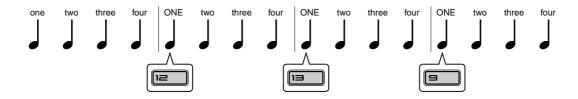
The Transpose function lets you change the pitch or key of the Pattern as it plays back. With this, you can change chords on the fly, and create your own chord progressions — instantly, as you perform.

Let's try it out. Select a Pattern and start it up. Now, hold down [SHIFT] and press [KEYBOARD].

The button flashes.
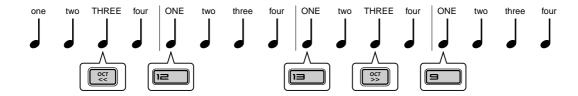
As the Pattern plays, try pressing various keys. For example, press [12] — and hear how the key changes. Press [9], and you're back to the original pitch. (Remember that buttons 1, 4, and 8 don't have any effect here.)

The trick to using this effectively is hitting the pitch changes right on the beat. To get the hang of it, try this simple example — counting "one, two, three, four" with the Pattern — and stay in time with the rhythm.

| one | two | three | four | ONE | two | three | four | ONE | two | three | four | ONE | two | three | four |

[12]   [13]   [9]

Try changing pitch on other beats in the Pattern as well — for example, not just on the "one," but hitting the "one" and "three" both. Or on all four beats, for some unusual, "busy" changes. And did you know that you can use the [OCT <<]/[OCT >>] buttons, too? This next example may take a little practice...

| one | two | THREE | four | ONE | two | three | four | ONE | two | THREE | four | ONE | two | three | four |

[OCT <<] [12]   [13] [OCT >>] [9]

Notice that the octave doesn't actually change until you hit the number button on the keyboard.

Experiment with other Patterns as well. And when you're done, don't forget to press the [EXIT] button to leave the function.

Tech talK

Transpose

Determines the key of Pattern playback. To enable, hold down [SHIFT] and press [KEY-BOARD], then press appropriate buttons on keyboard. Use [OCT <<]/[OCT >>] to change octave. The number of semitones that the pitch has been transposed is indicated in the display.
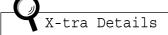
Range
-24 — 24

Tip 27 Swing

Here's an instant way to change the rhythmic feel of a Pattern. Play it straight, or give it some swing.

Call up a Pattern and start it up. While it's playing, press the [SWING] button and turn the [DATA] knob.

Try a setting of about 65 - 70 and notice how the Pattern takes on a "bouncy" feel. Experiment with different settings and different Patterns. Judicious use of Swing can make the Patterns sound less mechanical — and give your tracks a more "human," natural feel.

X-tra Details

• The Swing effect differs depending on the selected Pattern. For certain Patterns with few notes (such as only quarter notes), Swing may have little to no effect.

• When the Beat parameter (page 18) is set to " ¡¿," Swing has no effect on the Pattern.

Tech talk
Swing

Determines the amount of swing or triplet feel in Pattern playback. (Does not change the actual recorded data.) While a Pattern is playing, press the [SWING] button and turn the [DATA] knob to change the value.

Range
50 (straight) — 83 (maximum swing)

Tip 28 Muting tracks

The Patterns of the DX200 contain and play back up to four separate tracks — the Synth track and three Rhythm tracks. The convenient Track Mute feature lets you selectively mute these tracks — even during playback.

Track Mute actually has two main applications: one in recording, the other in live performance. When recording several tracks to a Pattern (page 70), it's often useful to hear only one or two of your previously recorded tracks — and Track Mute is ideal for this.

However, where Track Mute REALLY shines is in live performance. Pro DJs and dance music artists can whip the crowd into a frenzy by dropping parts out and bringing parts in. For example, bringing everything down to the drums is a great dynamic trick that keeps the dancers grooving. From there, you can gradually build things up, adding track by track until you have the whole mix cooking. Or bring everything in all at once, and watch the crowd explode.

1 Call up and start one of the Patterns.

2 Let's start by muting the Synth track. While holding down [SHIFT], press [1] on the keyboard.

Notice how buttons [1], [2], [3], and [4] light while you hold down [SHIFT] — this means all four tracks are on. Button [1] corresponds to the Synth track; when you press this, the Synth track cuts out. To bring the Synth track back in, simply hold down [SHIFT] and press [1] again.

3 Now, do the same with Rhythm tracks 1, 2, and 3 — which are assigned to buttons [2], [3], and [4], respectively.
While the Pattern is playing, try muting and unmuting the tracks in time with the rhythm. The lighted buttons let you see at a glance which tracks are active — a great help when doing this live.

📖 Tech talK

Track Mute

Allows selective muting of the four tracks: Synth and Rhythm 1 - 3. Two methods are available:

Method 1
Holding down [SHIFT] and pressing number buttons [1], [2], [3], and [4].

Method 2
Holding down [SHIFT] and pressing [SYNTH TRACK] or [RHYTHM TRACK].

In Method 2, [RHYTHM TRACK] is an eight-way toggle switch. Each button press (as you hold down [SHIFT]) steps through all Track Mute settings.

For both methods, the LED next to the track number lights to indicate that the track is on.
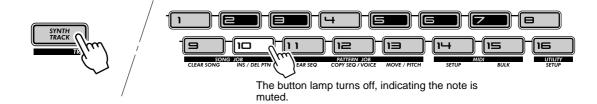
Tip 29 Muting notes during playback

Here's a Tip that's useful both in live performance AND in creating Patterns. It's called Step Mute and it lets you modify an existing Pattern by taking out specific notes — while the Pattern is playing.

Step Mute is another great way to change the rhythmic feel and melodic content of a Pattern — without permanently changing the original data. Let's try it out...

1 Select a Pattern and start it up.

2 Make sure the Synth track is on (press [SYNTH TRACK] if necessary), then press one of the keyboard buttons.

The button lamp turns off, indicating the note is muted.

Hear how the selected note drops out? You can press the same button again to put the note back in. Try pressing some other buttons and listen to how their presence or absence affects the feel of the Pattern.

3 Do the same with the Rhythm Tracks as well.
Press [RHYTHM TRACK] repeatedly to select the desired Rhythm Track: 1, 2, or 3. Then, press the keyboard buttons — just as you did in Step 2 above.

PoWer HintS

- **Adding and subtracting beats**
  Did you notice that you can add sounds, too? This is especially effective in the Rhythm tracks.
  If the selected Rhythm track has some unlit buttons — meaning there are spaces in the track
  — try pressing some of those buttons to add more drum/percussion hits to the track. Or try
  taking some of the lit buttons' sounds out, and hear what kind of rhythm you come up with.

- **Save your edits**
  If you like the new Pattern you've created, store it. (See page 79.) All Step Mute settings are
  saved along with the stored Pattern; yet the original data is not changed.

Tech talK

Step Mute

Allows you to mute and unmute specific
steps in a Pattern during playback. Select
and start a Pattern, then select the track you
wish to control: Synth or Rhythm 1, 2, or 3.
Then, press the desired buttons to mute/
unmute the steps.

Tip 30 Mixer controls – Pan and Volume

Try these bread-and-butter controls out, and change the mix of the Patterns. Pan and Volume only affect the
Synth track — the Rhythm tracks remain unchanged.

1 Select a Pattern and start it.

2 Let's try changing the Pan position first.
Hold down the [SHIFT] button, and turn the [PARAM] (PAN) knob.

Notice how the Synth track sound moves from left to right and back again
as you turn the knob? (We assume you're listening to this with stereo
headphones or on a stereo speaker system...)

Tech talK

Pan

Determines the position of the Synth track
sound in the stereo image. Hold down
[SHIFT], and turn the [PARAM] (PAN) knob
to adjust.

Range
$L 63$ (full left) — $Cntr$ (center) —
$r 63$ (full right)
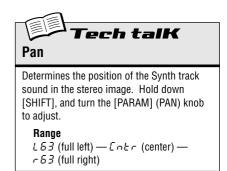
3 Now, work with the Volume.
Hold down the [SHIFT] button, and turn the [WET] (VOL) knob.
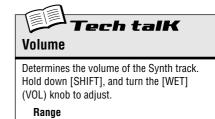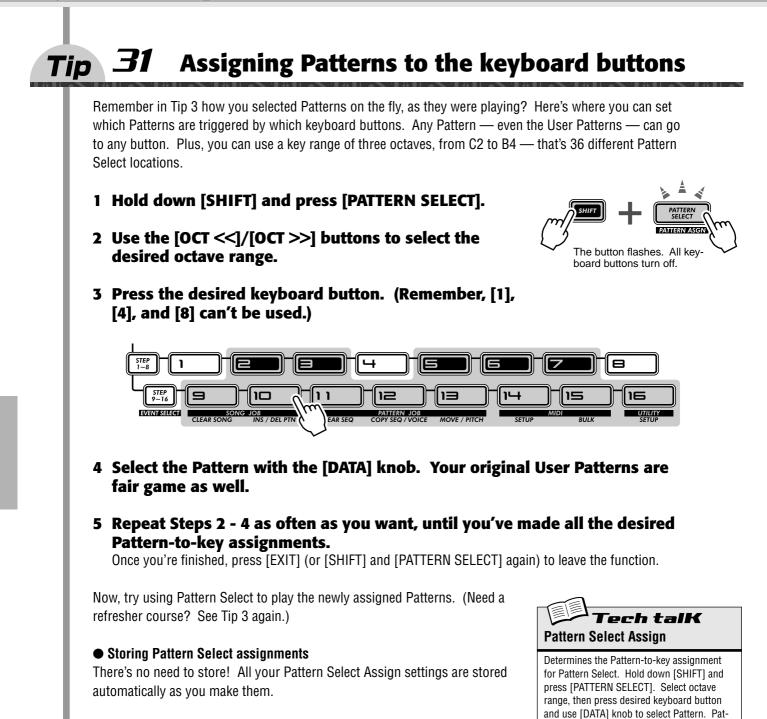
Hear how the Synth sound fades in and out as you tweak the knob?

Remember, this only affects the Synth track — unlike the master [VOLUME]
knob, which controls the overall sound of the DX200.

Tech talK

Volume

Determines the volume of the Synth track.
Hold down [SHIFT], and turn the [WET]
(VOL) knob to adjust.

Range
0 — 127

Tip 31 Assigning Patterns to the keyboard buttons

Remember in Tip 3 how you selected Patterns on the fly, as they were playing? Here's where you can set which Patterns are triggered by which keyboard buttons. Any Pattern — even the User Patterns — can go to any button. Plus, you can use a key range of three octaves, from C2 to B4 — that's 36 different Pattern Select locations.

1 Hold down [SHIFT] and press [PATTERN SELECT].

The button flashes. All keyboard buttons turn off.

2 Use the [OCT <<]/[OCT >>] buttons to select the desired octave range.

3 Press the desired keyboard button. (Remember, [1], [4], and [8] can't be used.)

4 Select the Pattern with the [DATA] knob. Your original User Patterns are fair game as well.

5 Repeat Steps 2 - 4 as often as you want, until you've made all the desired Pattern-to-key assignments.
Once you're finished, press [EXIT] (or [SHIFT] and [PATTERN SELECT] again) to leave the function.

Now, try using Pattern Select to play the newly assigned Patterns. (Need a refresher course? See Tip 3 again.)

● **Storing Pattern Select assignments**
There's no need to store! All your Pattern Select Assign settings are stored automatically as you make them.

📖 **Tech talk**
Pattern Select Assign

Determines the Pattern-to-key assignment for Pattern Select. Hold down [SHIFT] and press [PATTERN SELECT]. Select octave range, then press desired keyboard button and use [DATA] knob to select Pattern. Pattern assignments are stored automatically.

LFO Modulation

*Here's another crucial cornerstone in synthesizer sound — the LFO.
Although LFO modulation can be used to make the sound warmer and more
natural, its strong forte is in creating wild and extreme special effects.
Explore the following Tips and you'll soon build up a huge arsenal of power-
ful tools for mangling the sound in awesome ways.*

Tip 32 Modulating the volume

Get to know your LFO.
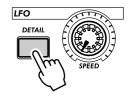
This Tip takes you through the basics in setting up and using the LFO. It also introduces you to one of the
more popular LFO applications — modulating volume. Used with some of the other sound shaping controls
on the DX200, this is responsible for the machine gun effects, helicopter-like sounds and a slew of other
industrial noises you hear in a lot of techno, electronica and dance music today.

1 Call up a Pattern.

**2 Press [DETAIL], several times if necessary, until "* Π∂*"
(Amplitude Modulation Depth) appears briefly in the
display.**

3 Use the [DATA] knob to set the value to "*99*."
This is the Amplitude Modulation Depth setting — "amplitude" meaning
"volume." Setting Amplitude Modulation Depth to 99 puts the LFO in maxi-
mum control over the volume of the sound.

**4 Press [KEYBOARD] to use the keyboard, and hold
down one of the keys.**
Hear how the the sound wavers in and out, in a tremolo effect?

**5 As the note sounds, tweak the LFO [SPEED] knob —
and hear how the modulation alternately speeds up
and slows down.**

Tech talK

Amplitude Modulation Depth

Determines the amplitude (volume) depth for
the LFO. To set, press [DETAIL] repeatedly
(until "*Π∂*" appears), and use [DATA] knob
to set value. (Pressing [DETAIL] repeatedly
steps through the other LFO Detail parame-
ters; see page 42.)

Range
0 — 99

Tech talK

Speed

Determines the speed of the LFO modulation.
Range
Stop (no modulation), 1 — 99

Tip **33 Modulating the Filter**

Now, let's apply the LFO to the Filter — and create some interesting wah-wah effects.

1 Press [DETAIL] until "$F\Pi d$**" (Filter Modulation Depth) appears briefly in the display.**

2 Use the [DATA] knob to set the value to around "50**."**

This is the Filter Modulation Depth setting. Setting Filter Depth to 50 gives the LFO some control over the timbre or tonal quality of the sound.

3 Press [KEYBOARD] to use the keyboard, and hold down one of the keys.

Can you hear the wah-wah sound?

X-tra Details

If you've come to this Tip directly from Tip 32 above, you're hearing the LFO applied to both Amplitude and Filter. To hear the Filter effect all alone by itself, set Amplitude back to normal (0).

Tech talK

Filter Modulation Depth

Determines the Filter modulation depth for the LFO. To set, press [DETAIL] repeatedly (until "$F\Pi d$" appears), and use [DATA] knob.

Range
0 — 99

For more fun:

Try tweaking the VCF controls. Naturally, if the LFO is being applied to the Filter, any changes you make to the Filter section will affect the LFO-modulated sound as well.

Tip *34* Modulating the pitch

Try using the LFO to warp the pitch — and discover some more awesome modulation effects.

1 Press [DETAIL] until "*PΠd*" (Pitch Modulation Depth) appears briefly in the display.
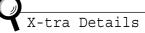
2 Use the [DATA] knob to set the value to "*0*."
This is Pitch Modulation Depth. Start out with this minimum value.

3 Press [KEYBOARD] to use the keyboard, and hold down one of the keys.
As the sound sustains, slowly turn the knob clockwise. Notice how the pitch becomes less and less distinct the further you get from "*0*." For some Voices, the pitch may stay distinct but change radically — over an octave or more!

Try experimenting with different LFO Speed settings, and also try holding down more than one note.

X-tra Details
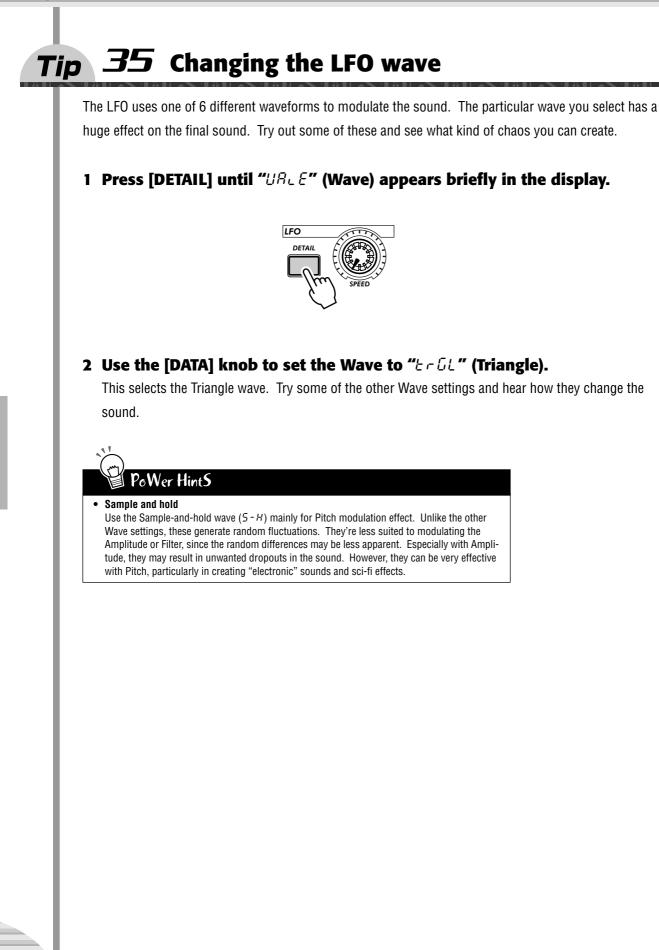
If you've come to this Tip directly from the other LFO Tips above, you may want to hear the Pitch modulation by itself. To do this, set both Amplitude and Filter back to normal (*0*).

Tech talK
Pitch Modulation Depth
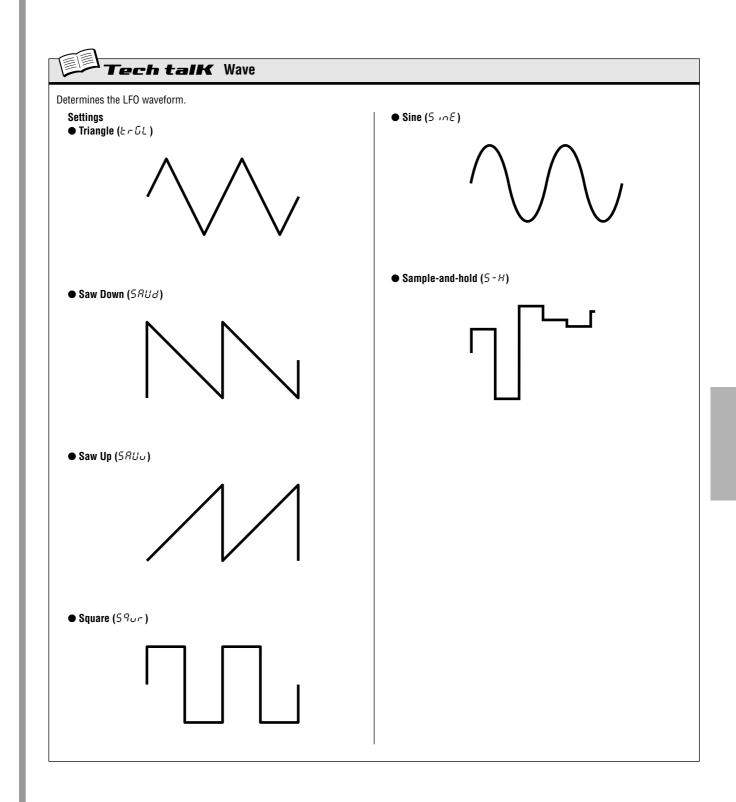
Determines the two Pitch Modulation Depth settings for the LFO. To set, press [DETAIL] (until "*PΠd*" appears), and use [DATA] knob.

Range
0 — 99

Tip *35* **Changing the LFO wave**

The LFO uses one of 6 different waveforms to modulate the sound. The particular wave you select has a huge effect on the final sound. Try out some of these and see what kind of chaos you can create.

1 Press [DETAIL] until "*UAᴸE*" (Wave) appears briefly in the display.

2 Use the [DATA] knob to set the Wave to "*ᴸᵣᴳL*" (Triangle).

This selects the Triangle wave. Try some of the other Wave settings and hear how they change the sound.

PoWer HintS

• **Sample and hold**
Use the Sample-and-hold wave (*5-H*) mainly for Pitch modulation effect. Unlike the other Wave settings, these generate random fluctuations. They're less suited to modulating the Amplitude or Filter, since the random differences may be less apparent. Especially with Amplitude, they may result in unwanted dropouts in the sound. However, they can be very effective with Pitch, particularly in creating "electronic" sounds and sci-fi effects.

Tech talk Wave

Determines the LFO waveform.

Settings
● **Triangle** (*trGL*)

● **Sine** (*SinE*)

● **Saw Down** (*SAUd*)

● **Sample-and-hold** (*S-H*)

● **Saw Up** (*SAUu*)

● **Square** (*Sqor*)

EG Basics

Shape the volume, shape the tone. Use the EG (Envelope Generator) section to control how your sound moves, grows and evolves.

X-tra Details

As you work through the Tips in this chapter, keep in mind that the actual sound and the effects of the suggested tweaking may widely differ depending on the selected Patterns, the LFO settings (see Chapter 9), and the current EG settings. If the sound doesn't change or changes unexpectedly, try selecting a different Pattern.

Tip *36* **Shaping the sound with EG**

One of the most important aspects in analog synthesizer sound is how that sound is controlled over time. The DX200 gives you some very powerful and flexible ways to do this. One of them is the EG section.

EG stands for Envelope Generator — "envelope" here being the control that shapes the sound as it evolves over time. The EG effectively tells the synthesizer when to bring the volume up or down.
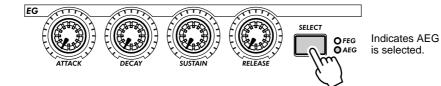
Like most analog synthesizers, the DX200 has four EG controls: Attack, Decay, Sustain, and Release. The DX200 also lets you use the EG to control the filter — to shape the tone in time.

Let's take a look at how these work — and hear them in action.

1 Call up a Pattern, and press [KEYBOARD] to enable the keyboard buttons.

2 Press the [SELECT] button in the EG section so that the AEG lamp lights.

Indicates AEG is selected.

Doing this lets you control only the AEG (Amplitude EG), which affects the volume.

3 As you play the buttons, turn the [ATTACK] knob. Try setting it to around 2:00 and tap the buttons repeatedly.
Notice how the attack of the sound is a little slow? Now, set the knob to its minimum (7:00), and hear how the attack is instantaneous. Next, try setting the knob to around 4:00 or 5:00 and hear how the sound very slowly grows louder as you hold the key.

4 Let's try the [SUSTAIN] knob now.
Keep in mind that Sustain is the ONLY level control in the bunch — the rest of the knobs control time or rate.

Start with [SUSTAIN] set to around 9:00 (a value of 15 - 20). Then play and hold down a note. Do the same with successively higher settings as well — 12:00 (*64*), 2:00 (*95*), and 5:00 (*127*).

Hear how the sustain or "held" sound of the Voice gets louder with each setting above? For the 5:00 setting, the volume reaches maximum and stays there as long as you hold the note.

5 Next, play with the [DECAY] knob and hear how that affects the sound.

Experiment with the [DECAY] knob. Depending on the Voice and the other EG settings, a short Decay value (knob around 9:00) may result in a weak, percussive sound. Try adjusting the knob around 11:00 or 12:00 and then slowly move upwards from that as you repeatedly play the key.
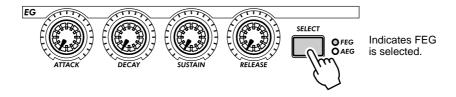
6 Now, on to the [RELEASE] knob.

Start by resetting [ATTACK] to 7:00, [DECAY] to 11:00, and [SUSTAIN] to 1:00. Then experiment with different [RELEASE] knob settings, such as 1:00, 3:00 and 5:00.

Notice that the sound sustains — longer and longer for each setting — after you release the note.

Before you go on to Step 7 below, bring [RELEASE] back to around 1:00, and leave the other knobs unchanged.

7 To make things more interesting, press [SELECT] to turn on the FEG controls, and use the EG knobs to play around with the filter. (We'll do more exploring with the filter in the next tip, too.)

Indicates FEG is selected.
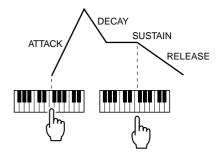
Play around with the four EG knobs and hear what kinds of sonic mayhem you can create.

Work with the VCF section controls (page 27), too — they have a huge effect on the overall sound and behavior of the EG. We'll warn you, though — the results can be complex and unpredicatable. But we guarantee you'll discover a whole truckload of sounds you never thought possible.

● **What is an EG? What does it do?**

To explain by example, let's take a look at an acoustic instrument — the piano. The piano doesn't actually have any EGs inside, but the basic principle is the same.

When you hit a key on the piano, the sound starts sharply (Attack), but goes down soon (Decay) to a softer level (Sustain) as the note is held, and quickly dies out to complete silence (Release) when you lift your finger from the key.

PoWer HintS

- **Tweak them together**
  When you start out tweaking the EG, you may want to set [SELECT] to both FEG and AEG. This eliminates a lot of confusion about which EG is doing what. For example, if you have separate settings and the FEG opens up long after the AEG has already shut down, you'll probably not hear much of the sound. Similarly, if the AEG takes its sweet time to unfold — by which time the FEG has already come and gone — the sound may never come through.

- **Tweak them separately**
  Adjusting both FEG and AEG together (see hint above) is convenient and easy — but it also may result in relatively boring, static Voices. To make really interesting, organic sounds with shifting textures, the trick is to adjust the Filter and Amplitude EGs separately, yet make sure that they coincide with each other often enough to keep the sound from dropping out entirely. There are no diagrams to help you with this — you'll have to use your ears!

Tech talk

EG Select — FEG and AEG

Determines the EG settings for the filter (*FEG*) and amplitude or volume (*AEG*). Press [SELECT] to enable FEG, AEG or both (*ALL*), then use the EG controls (see below) to change the EG settings.

Settings
FEG
AEG
ALL (both FEG and AEG)

Tech talk

EG Controls

Attack
Determines the time it takes for the sound to reach full volume when a note is played.

Decay
Determines the time it takes for the sound volume to reach the Sustain level. This is similar to the natural decay heard in acoustic instruments.

Sustain
Determines the level of the sound for when a note is held. If this is at or near minimum, the sound will die out as the note is held. If this is at or near maximum, Decay will have no effect and the sound will remain at maximum level as long as the note is held.

Release
Determines the time it takes for the sound to reach minimum volume (or silence) after a note is released. If Sustain is set too low, this may have little to no effect on the sound.

Range
0 — 127 (for each knob)

Tip *37* **Using EG to control the Filter (FEG)**
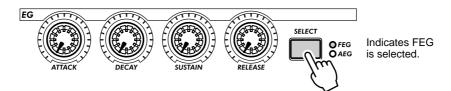
In Tip 36 above, we introduced you to the EG and showed you how it works with volume (Amplitude). Now, let's take a look at what the EG can do with the Filter.

These specific FEG setting examples will get you started, and give you a definite feel for how to use EG to change the tonal quality of the sound. In the process, you'll learn more about how the Filter works, too — and how you can get it to work for you.

Try out these settings, experiment with them, go wild, go mad! There's so much you can do with these controls, so many sonic possibilities — this barely scratches the surface.

1 Select a Pattern, then select FEG.
Press the [SELECT] button repeatedly until FEG is lit.

Indicates FEG is selected.

2 Start by setting a slow Attack on the Filter.
Set [ATTACK] to around 2:00 (value of *95*).

3 Play around with the [CUTOFF] knob as you play the keys.
Tweak the knob slowly in the range of 7:00 - 2:00 (*0 - 95*) as you play single notes in succession. Listen to how the sound changes. Finally, set the knob to around 8:00 or 9:00 (*1 - 15*).

4 Now, experiment with the [SUSTAIN] knob.
Try tweaking this to different settings as you play the keys. Make sure you hold the key or keys down — the sound will change as you hold. Before you go on to the next steps, set this to around 11:00 (*50*).

5 Before we try out the [RELEASE] knob with the Filter, we'll need to stretch out the volume a bit.
Press [SELECT] to call up AEG, then set the AEG's [RELEASE] to about 2:00 (*90 - 95*).

6 Now, go back to the FEG (press [SELECT]), and work with the FEG's [RELEASE] knob.
Play a series of single notes, and tweak the knob between 11:00 and 4:00 (*45* and *120*).

Notice how the FEG Release setting determines how much of the sound is heard after key is released. If the Filter Release is too short, little or none of the sound will come through.

Finally, set this to around 12:00 or 1:00 (*65 - 80*).

7 Just for good measure, play around with the [DECAY] knob a bit.

As with the other controls, tweak this to various settings as you play the keys. Finally, set this to around 1:00 or 2:00 (*80 - 90*).

8 You're on your own now!
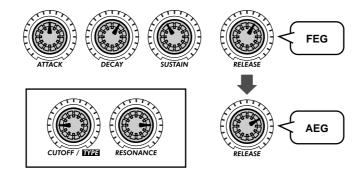
With the above settings as a starting point, go back to each of the EG knobs and play around with them some more. Take a crack at using other controls as well — and hear how they change the sound. And while you're at it, go on to Tip 38 below — for further FEG explorations.

Tip *38* More about FEG Depth

In Tip 37, you learned about the FEG Depth control. Let's take a closer look (and listen) to it in this Tip — and the next.

1 If possible, continue with the sound you've created in Tip 37 above.

Select a Pattern, and tweak the controls to the basic settings shown below.

2 Now, play around with the [FEG DEPTH] knob.

First, set it to around 12:00 and slowly turn it clockwise while you play the keys. Listen for the sound changes — some of them will probably be quite subtle.

Tweak the knob the other way, and hear how the sound drops out for the negative values (7:00 - 12:00). Don't worry about this — we'll see in Tip 39 below how to effectively use the negative settings.

Finally, set the knob to about 2:00 (*50*). Experiment with the [RESONANCE] knob, too. Try out a variety of settings — especially around 1:00 - 4:00 — and hear how they alter the tone.

Tip 39 Going negative – with FEG Depth
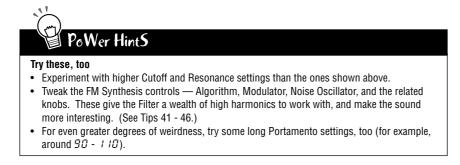
As we promised in the last Tip, here's a sound-creating pointer that takes advantage of the negative values of FEG Depth. Try these settings out — and hear what it's like on the "minus" side of the sound.

1 First, get everything set up with the following settings:

EG [SELECT]........... to "*ALL* " (both FEG and AEG)
[ATTACK] .... to around 2:00 (*90 - 100*)
[DECAY].................. to around 1:00 (*80*)
[SUSTAIN] .... to around 3:00 - 4:00 (*100 - 120*)
[RELEASE].............. to around 1:00 - 2:00 (*80 - 90*)
[CUTOFF] .... to around 2:00 (*100*)
[RESONANCE] .... to around 2:00 (*70*)

2 Finally, set the [FEG DEPTH] knob to 7:00 (- *128*) — the maximum negative value.

3 Now, play several single notes, slightly apart, and listen for the very slow attack and the long sustain. Hear how the filter slowly sweeps and grows with the sound?

A negative FEG Depth setting reverses the FEG operation — producing a filter sweep effect that dips down instead of peaks. This means the sound gets softer and more muffled, until the end — when the filter sweeps back up again.

PoWer HintS

Try these, too
- Experiment with higher Cutoff and Resonance settings than the ones shown above.
- Tweak the FM Synthesis controls — Algorithm, Modulator, Noise Oscillator, and the related knobs. These give the Filter a wealth of high harmonics to work with, and make the sound more interesting. (See Tips 41 - 46.)
- For even greater degrees of weirdness, try some long Portamento settings, too (for example, around *90 - 110*).

Advanced Sound Shaping Controls

By this point, you're well on your way to becoming a master synthesizer programmer. You've learned about the Patterns, the Scenes, Effects, the Filter, LFO, EG, and so on — but your education's not over yet. The DX200 has actually got quite few more sonic tricks up its sleeve. Let's try some of them out now...
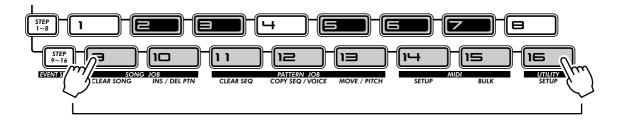
Tip ***40*** **Portamento – the famous gliding pitch effect.**

You've heard the sound before. Although singers and instrumentalists use it to bend up or down to a central pitch, Portamento is one of the defining features of analog synthesizers and electronic music.

Portamento packs enormous power. On the one hand, it lets you add subtle sliding "grace notes." On the other, it can completely subvert the pitch and give you atonal glides. Ultimately, the effect is dependent on what notes you play and how far apart you space them. Try it out and see what madness you can come up with.

1 Call up a Pattern, and set the [PORTAMENTO] knob to about 10:00 (around *30* in the display).

2 Enable the keyboard with [KEYBOARD], then play notes [9] and [16] alternately.

3 Try other settings, too, and hear how the Portamento effect changes.
Bring Portamento up to about 12:00 (*50*), then 2:00 (*70*), and finally the maximum of 5:00 (*99*).

Experiment. Try the effect out on some of your other favorite Voices. Also try tweaking Portamento while the Pattern is playing — and listen to the resulting sonic mayhem.

📖 **Tech talk**

Portamento

Determines the Portamento time, or how long it takes to glide the pitch from one note to the next. Higher values result in a longer pitch glide time.

Range
0 — 99

Tip *41* **Selecting the Algorithm**

Algorithm is one of the fundamental controls behind the FM Synthesis sound of the DX200. It determines how the basic sound-generating elements (operators) of the synthesizer are organized and combined.
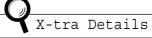
Without getting into too deep of a discussion of FM Synthesis (you can read more about that on page 116), selecting an Algorithm changes how the six operators are configured. Depending on the configuration, you can get a very pure, soft sound, or some extremely harsh metallic noise — and just about everything in between.

1 **Select and start one of the Patterns.**

2 **Press the ALGORITHM [TYPE] button.**

ALGORITHM

TYPE

3 **Change the Algorithm Type.**
Use the [DATA] knob to select different Algorithms. A total of 32 are available. You can also use the [TYPE] button to step through the Algorithms one-by-one.

X-tra Details
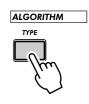
Depending on the selected Algorithm, the Voice may sound muffled or go absolutely silent. If this happens, simply select a different Algorithm.

PoWer HintS

- **Work with Modulator and the others**
  The true power in the Algorithm control is how it affects and is affected by the other FM controls — Modulator, Harmonic, FM Depth and Decay. All of these are interdependent, so tweak them together and listen carefully to hear how they interact. Better yet, explore Tips 42, 43 and 44 to find out more about changing the FM sound.

Tech talK
Algorithm Type

Determines the combination of the six FM operators, and whether a particular operator is used as sound-generating "carrier" or as a sound-shaping "modulator." (For more about Algorithms and FM Synthesis, see page 116.)

To change the press the ALGORITHM [TYPE] button and use the [DATA] knob. Pressing [TYPE] repeatedly advances through the Algorithms.

Range
1 — 32

Tip *42* **Shifting Harmonics**

Now that you've tried out a few different Algorithms (in Tip 41 above), tweak the FM sound some more with the Modulator controls. These give you enormous control over the sound of the DX200 Voices — letting you add a rich spectrum of harmonics to the sound, and/or radically change the basic pitch.

1 Select a Pattern and enable the keyboard for playing the Voice.

2 Press the MODULATOR [SELECT] button to select one of the Modulator settings: "*3*", "*2*", " *1*", or "*ALL*."

3 Now, tweak the [HARMONIC] knob.
Hear how the sound changes? Notice the change in pitch and the added harmonics you get when you twist the knob.

If the sound doesn't seem to change much, try a different Modulator setting (in Step 2 above). Also try selecting a different Algorithm Type (Tip 41), and see what wild sounds you can generate with just these controls.

PoWer HintS

- **Work with FM Depth**
  FM Depth has a huge impact on how the Harmonic control works. For best results, you'll want to tweak both these knobs in turn. Check out Tip 43 and discover the broad spectrum of sound-shaping possibilities they give you.
- **Fine tuning**
  Since the sound and pitch can radically shift with even the slightest knob tweak, you may want to use the [DATA] knob instead. This lets you control Harmonic much more slowly. Make sure you turn [HARMONIC] knob first, so that Harmonic is called up for the [DATA] knob.
- **Bring in the highs**
  When using Modulator and the FM-related knobs to craft a Voice, make sure to adjust the VCF controls to appropriate settings, so that you can hear all of the high harmonics being generated. Remember, you can always back off on the knobs later if the sound is too "edgy."

MODULATOR

SELECT ○ *3*
        ○ *2*
        ○ *1*
        ○ *ALL*

Tech talK
Modulator Select

Determines which group of Modulators in the Algorithm is selected for control by the [HARMONIC], [FM DEPTH], and [DECAY] knobs. The actual effect of this and which Modulators are actually selected depends on the Algorithm setting (page 53). (For more about Modulators and FM Synthesis, also see page 116.)

To select, press the MODULATOR [SELECT] button. There are three groups of Modulators, to which one or more Modulators are arbitrarily assigned. Selecting "*ALL*" gives you control over all three of the Modulator groups, for the greatest amount of harmonic change.

Settings

3
  Selects the third group of Modulators.
2
  Selects the second group of Modulators.
1
  Selects the first group of Modulators.
ALL
  Selects all Modulators.

For a chart showing all 32 algorithms and the Modulator groups, see page 123.

Tech talK
Harmonic

Determines the frequency of the selected Modulators. First, select the desired group of Modulators (in Modulator Select above), then tweak the [HARMONIC] knob.

Range
-64 — 63

Tip *43* **Mellow or metallic – FM Depth**

Depending on the other settings, FM Depth can be very subtle, adding harmonics or changing the pitch — almost imperceptibly at times. Keep in mind that it works interdependently with the other Modulator controls, so you'll need to factor these in as well. (By the way, did you notice the lines on the panel connecting the MODULATOR [SELECT] button with the [HARMONIC], [FM DEPTH], and [DECAY] knobs? All these controls are related.)

FM Depth can also create harsh, metallic, non-pitched sounds — perfect when you want to add some industrial edge or noise percussion to your tracks.

1 Select a Pattern.

2 Press the MODULATOR [SELECT] button to select one of the Modulator settings: *"3", "2", " 1", or "ALL."*
You may want to select *"ALL"* for this, since tweaking all of the Modulators at once makes for more dramtic sound changes.

3 Now, tweak the [FM DEPTH] knob.
Try setting the knob to around 3:00 or 4:00, and hear how the sound gets brighter and more brittle. Turn the knob down towards 8:00 or 9:00, and hear how the sound becomes softer and more pure in pitch. Also, try turning it very slowly as you play the keyboard and hear how the Voice changes. Depending on the other settings, FM Depth changes can be very subtle — or extreme and harsh.

FM DEPTH

If you can't hear much of a change, try a different Modulator setting (in Step 2 above) and/or a different Algorithm Type (Tip 41). These can set you on some very unusual sound-creation paths.

PoWer HintS

- **Work with Harmonic**
  Harmonic (Tip 42 above) and FM Depth are two sides of the same sound-shaping coin. For best results, you should tweak one then the other to hear the effect they have on each other.
- **Work with Decay, too**
  Decay is also an important component in the FM Synthesis sound, and directly affects the FM Depth. Try setting it to different values as you tweak the other two Modulator-related knobs, then go on to Tip 44 below and learn more about the control.
- **Take it slow**
  Since even the slightest knob move can send the sound wildly careening off into space, you may want to slow things down by using the [DATA] knob. Just turn the [FM DEPTH] knob a bit (to select the parameter), then slowly tweak the [DATA] knob.
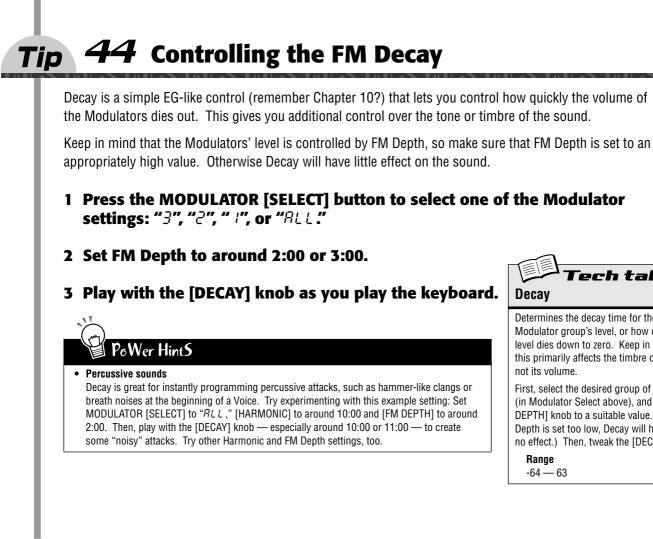
Tech talK
FM Depth

Determines the level or volume of the selected Modulators. First, select the desired group of Modulators (in Modulator Select above), then tweak the [FM DEPTH] knob. Some settings can result in a metallic sound with no discernable pitch; some settings completely change the pitch.

Range
-64 — 63

Tip *44* **Controlling the FM Decay**

Decay is a simple EG-like control (remember Chapter 10?) that lets you control how quickly the volume of the Modulators dies out. This gives you additional control over the tone or timbre of the sound.

Keep in mind that the Modulators' level is controlled by FM Depth, so make sure that FM Depth is set to an appropriately high value. Otherwise Decay will have little effect on the sound.

1 Press the MODULATOR [SELECT] button to select one of the Modulator settings: "*3*", "*2*", "*1*", or "*ALL.*"

2 Set FM Depth to around 2:00 or 3:00.

3 Play with the [DECAY] knob as you play the keyboard.

PoWer HintS

- **Percussive sounds**
  Decay is great for instantly programming percussive attacks, such as hammer-like clangs or breath noises at the beginning of a Voice. Try experimenting with this example setting: Set MODULATOR [SELECT] to "*ALL* ," [HARMONIC] to around 10:00 and [FM DEPTH] to around 2:00. Then, play with the [DECAY] knob — especially around 10:00 or 11:00 — to create some "noisy" attacks. Try other Harmonic and FM Depth settings, too.

Tech talK
Decay

Determines the decay time for the selected Modulator group's level, or how quickly the level dies down to zero. Keep in mind that this primarily affects the timbre of the Voice, not its volume.

First, select the desired group of Modulators (in Modulator Select above), and set the [FM DEPTH] knob to a suitable value. (If FM Depth is set too low, Decay will have little to no effect.) Then, tweak the [DECAY] knob.

Range
-64 — 63

Tip *45* **Noise Level**

Here's another nifty little knob. This one's great for throwing some grunge and bite into the basic wave — letting you dirty up the Voice with some noise.

Why add noise? Why not use the Distortion effect? And what good is "dirt" in the sound, anyway? (We could hear those questions coming...)

Well, besides the obvious Lo-fi and Industrial music applications — such as making noise percussion — noise is great for adding harmonic content all along the frequency spectrum. And that harmonic content added at the beginning of the signal flow makes the sound more interesting when you work with the filter (VCF) section later on. Much more interesting, in fact.

Use it judiciously, however — too much noise can mask the basic pitch and character of the sound.

Try selecting a Pattern with a relatively "pure" and soft Voice. Then, work the [NOISE LEVEL] knob to hear how different degrees of noise affect the sound. And go on to Tip 46 below, to see how you can use different types of noise, too.

Tech talK
Noise Level

Determines the level of the noise signal added to the sounds.

Range
0 — 127

Tip *46* **All kinds of noise**

Maybe you thought that if you've heard one kind of noise, you've heard them all. Not true. The Noise Oscillator on the DX200 gives you quite a choice of noise makers — sixteen in all!

As we pointed out in Tip 45, noise can be very useful in crafting sounds. Try selecting different noise types here and listen for the difference in sound.

1 Press the MODULATOR [SELECT] button, repeatedly if necessary, to select "*ALL.*"

2 Set both FM Depth and Decay to the minimum (*-64*).
Doing this takes all the high harmonics out of the sound, and leaves you with a relatively pure tone.
Also select both the AEG and FEG (with EG [SELECT] button), then set the EG Attack to the maximum. This gives the main sound a very slow ramp up — letting you better hear the noise.

3 Turn the [NOISE LEVEL] knob up to a respectable level, such as 2:00 or 3:00 (around *90 - 110*).
This lets you clearly hear the noise. Turn it up even more if you want.

4 Press the NOISE OSC [TYPE] button repeatedly to select different noise types.
Better yet, press [TYPE] and turn the [DATA] knob. That lets you access ALL sixteen of the noise types — including the "hidden" ones.

📖 ***Tech talK***

Noise Oscillator Type

Determines the type of noise for the noise oscillator. Press the [TYPE] button repeatedly; use [DATA] knob to select "hidden" noise types (indicated by asterisks below).

Settings
(Asterisks (*) indicate "hidden" types, selectable by [DATA] knob.)

The "Up" settings sweep the pitch (frequency) of the noise up at different rates, while the "Down" settings sweep the pitch down at different rates. The "Pitch" settings feature different noise effects that follow the keyboard; in other words, high keys play high pitches and low keys play low pitches. The "Variation" settings feature additional noise effects.

> White (*UHtE*)
> * Pink (*Pink*)
>   Up 1 (*uP-1*)
> * Up 2 (*uP-2*)
> * Up 3 (*uP-3*)
>   Down 1 (*dUn1*)
> * Down 2 (*dUn2*)
> * Down 3 (*dUn3*)
>   Pitch 1 (*PCH1*)
> * Pitch 2 (*PCH2*)
> * Pitch 3 (*PCH3*)
> * Pitch 4 (*PCH4*)
>   Variation 1 (*LAr1*)
> * Variation 2 (*LAr2*)
> * Variation 3 (*LAr3*)
> * Variation 4 (*LAr4*)

Tip 47 Fat, phatter and phattest!

How phat do you want to get?

Key Assign lets you configure the DX200 in either Poly or Mono operation, for full chords or single-note lines. Combined with the Unison setting, this function brings the humongously phat sounds of vintage synthesizers to the digital realm — letting you beef up the FM Voices the old analog way.

1 Call up a Pattern and press [KEYBOARD].
Try to select a Pattern that has a relatively thin, sustained Voice. Let's see where we can take it.

2 Press [KEY ASGN], repeatedly if necessary, to set this to Poly (*PoL 4*).
With the Poly setting, you can play and sustain full chords — up to sixteen notes at the same time.

COMMON

KEY ASGN
○ POLY
○ MONO
○ UNISON

3 Press [KEY ASGN] again to call up Mono (*Mono*).
In the Mono setting, you can't play chords — just one-note lines. But that's just fine, because Mono is ideal for leads and solos as well as bass lines.

Play some notes and listen for the effect. Notice how the notes trade off with each other? This is great for rapid trills, and also for funky bass parts — especially when you add a touch of Portamento (Tip 40).

Also try holding down one note with your left hand while you quickly play a flurry of other notes with your right. Notice how each note changes the pitch without retriggering the attack? That's because Mono keeps the EG consistent throughout all notes, as long as you hold the first one down.

4 Let's give the sound some serious attitude now. Call up one of the Unison settings (*u.PL 4* or *u.Mno*) – using [KEY ASGN] or the [DATA] knob.
The Unison settings let you fatten up the sound, for either Poly or Mono. Unison takes maximum advantage of the DX200's full polyphony by ganging the notes together in one huge, phat layer — four notes in Unison Poly and Unison Mono.

Tech talk
Key Assign

Determines how the Voices respond to the keyboard (or MIDI), and how they use the available sixteen-note polyphony. To set, press [KEY ASGN] and use the [DATA] knob.

Settings
Poly (*PoL 4*)
  Plays Voices with full sixteen-note polyphony.

Mono (*Mono*)
  Plays Voices monophonically, maximum one note at a time. Successively played notes do not retrigger the PEG, FEG, or AEG — resulting in a smooth note-to-note sound.

Unison Poly (*u.PL 4*)
  Plays four polyphonic notes in unison — for chords of up to four notes. This means you can play chords, yet still take advantage of the rich unison sound.

Unison Mono (*u.Mno*)
  Plays four polyphonic notes in unison — in a monophonic, one-note layer. In other words, the response to the keyboard is monophonic, but the number of notes actually sounding is polyphonic.
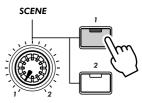
48 Creating your own original Scenes – and saving them

Tip

The exciting and powerful Scene feature lets you create and use two different Voices within a single Pattern. Most importantly, it lets you instantly switch between them or gradually "morph" from one to the other — all in real time.

You tried out some preset Scenes in Tip 23, and heard just how effective, dynamic, and ultimately hip the function can be. Now, it's time for you to create a Scene or two of your own.

1 Press SCENE button [1]. This is the Scene you'll be working on first.

Only button [1] is lit.

2 Work the controls and get the sound you want for Scene 1. Any and all of the Synth knobs can be used.

X-tra Details
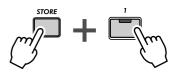
• Only the Voice-related panel knobs can be used for recording to the Scenes; button switch settings (such as LFO Detail and Key Assign) are ignored.

• Octave cannot be changed for the Scenes. In other words, both Scenes will always be kept at the same octave setting.

• Remember that you'll need to store your first Scene before you can create the second Scene. Switching or morphing to a new scene automatically and irrevocably erases any changes you've made.
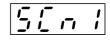
3 While holding down [STORE], press SCENE button [1].
Scene 1 has just been stored. Now let's go on to Scene 2.

X-tra Details

Make sure keep holding [STORE] until you've pressed SCENE button [1] or [2]. Otherwise, the DX200 will switch to the Store Pattern operation (page 79).

Indicates new settings have been stored to Scene 1.

4 Do the same operation for Scene 2 – repeating Steps 1 - 3 above with SCENE button [2] this time.

Tech talk
Scene Recording
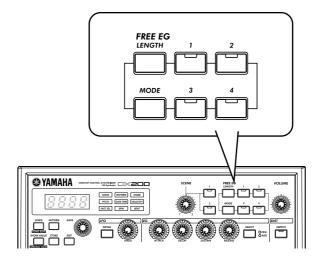
Allows you to program two different synth sounds as Scenes, and use the SCENE controls to switch or crossfade between them.

Press SCENE [1] to select Scene 1, and change the sound as desired. Store Scene 1 by holding down [STORE] and pressing SCENE [1]. Repeat the operation for Scene 2, using SCENE [2]. When finished, store the Pattern (page 79).

Free EG

Here's another ultra-cool power tool for the control freak in you. The DX200 is packed with an endless supply of sonic mayhem and wild, shifting synthesizer textures, but you can keep it all under control — with Free EG.

Tip *49* Free EG
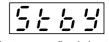
The DX200 has so many real-time control features, it's hard to get a grip on them all. Feel you need an extra pair of hands? Or maybe an extra two? No problem. Just use the amazing Free EG feature. The DX200 is packed with a lot of powerful recording functions — but none are quite as impressive as this.

Free EG gives you up to four tracks for recording your knob moves — letting you incorporate real-time sound changes and knob moves as a part of the Pattern. So every time you play the Pattern, your knob changes play right along with it — just as you recorded them.

We call this "Free EG" because it allows you to create unique, complex, continuous parameter changes that would be impossible to achieve with conventional EGs.

1 Call up the desired Pattern, and press the red Record button.

> 🔍 X-tra Details
>
> You may want to set the Length (Tip 64 below) in this step. Do it BEFORE pressing the Record button, however; Length cannot be set during Free EG recording.

Indicates recording is in standby.

2 Select the Free EG track you want to record.
Press the appropriate FREE EG button, [1] - [4]. The button lights to indicate the track is ready for recording.

Normally, [1] will be lit — so if you want to record to Track 1, you don't have to do anything here. If any track buttons you DON'T want to record to are lit, press them to turn them off.

Remember, you can record to more than one track simultaneously by pressing the appropriate buttons.
(See Power Hints below.)

3 Start the Pattern, and make your moves.

Press the Start/Stop button.

The metronome clicks to lead you into the recording, so you can start your knob moves right with the start of the Pattern.

Remember the rule: One knob, one track. Once you record a certain knob, no other knob can be recorded to the track (unless you start the whole Free EG recording again). Any tweaking of other knobs is ignored.

> X-tra Details
>
> The display number indicates the current measure number. If you've set Length (see Tip 64 below) to "*2*," the Pattern loops two times for recording, and the display changes accordingly.

4 To stop recording, press the Start/Stop button.

If you want to re-record the track or record moves to other tracks, go back to Step 2 above and start all over again.

5 To hear your Free EG recording, make sure that the appropriate track buttons are on, then press the Start/Stop button to play the Pattern.

Remember to save your newly edited Pattern! (See Tip 61.) All your Free EG track recordings will be saved right along with it.

PoWer HintS

- **Recording to more than one track at a time**
  Press the appropriate Free EG Track buttons. During recording, the DX200 automatically assigns each knob you move to the next available track. For example, let's say you're recording to Tracks 1 and 2. You move the CUTOFF knob first, and that's recorded to Track 1. Then, while tweaking Cutoff, you move [FEG DEPTH] — which records to Track 2.

- **Take your time and let the Pattern loop!**
  In a variation of the above hint, you can set all the tracks to record, then tweak each one separately as the Pattern loops. Each of your moves is properly recorded to a separate track, and you can hear the effect of your last knob tweak as you record the next.

- **Use the four tracks to your advantage**
  Record your tweaking of one certain knob to all four tracks, then choose the best "take" from the four. Just make sure to turn off each button after you record to it — so it doesn't play back and disturb your recording of the next button. Listen to each track in turn by turning the appropriate button on.

- **Change the way your Free EG tracks play back**
  The Type parameter (see Tech Talk below) gives you four different ways to loop the Free EG tracks. Try these out when playing your Pattern and hear the interesting things they do to your tracks.

Tech talk
Free EG — Type and Trigger

Type
Determines the type of loop for Free EG playback. Press the [MODE] button repeatedly until "*type*" appears, then use the [DATA] knob to change the setting.

Settings

off
No loop.

FUd (Forward)
Free EG sequence loops from start to end.

FUdH (Forward Half)
Free EG sequence loops from the middle to the end.

ALt (Alternate)
Free EG sequence loops from start to end, then end to start.

ALtH (Alternate Half)
Free EG sequence loops from middle to end, then end to middle.

Trigger ("*trig*")
Determines how playback of the Free EG tracks is triggered. Normally, this should be set to Free ("*FrEE*"), so that the tracks play back when the Pattern is started. Setting this to MIDI ("*nidi*") lets you start Free EG playback from a connected MIDI keyboard or sequencer.

Press the [MODE] button repeatedly until "*trig*" appears, then use the DATA knob to change the setting.

Settings

FrEE (Free)
Triggers playback of the Free EG tracks from a random start point, when a Note On message is received from a connected MIDI device, or when a key on the DX200 is played, or when the Pattern is started.

nidi (MIDI in Notes)
Triggers playback of the Free EG tracks from the start, when a Note On message is received from a connected MIDI device, or when a key on the DX200 is played.

ALL (All Notes)
Triggers playback of the Free EG tracks from the start, when a Note On message is received from a connected MIDI device, or when a key on the DX200 is played, or at the first recorded note of the Pattern (which may or may not be the start of the Pattern).

Strt (Sequencer Start)
Triggers playback of the Free EG tracks from the start, only when the Pattern is started.

Tip *50* **Changing the Length of your Free EG tracks**

The flexible little Length feature works both ways — both in recording and playback. It lets you set how long (in measures) your Free EG moves are recorded for, and it lets you separately set how long it takes for them to play back.

Set Length before recording any Free EG tracks. Specifically, set it BEFORE you press the red Record button (but after you've selected the Pattern) in Step 1 of Tip 49 above.

Press the [LENGTH] button repeatedly to step through the settings. (Or press [LENGTH] and use the [DATA] knob.) The number in the display indicates the Length in measures.

If you want to record your knob moves over two measures (two repeats of the Pattern), set this to "*2*." If you want your tweaking to stretch over eight measures, set it to "*8*."

Once your tracks have been recorded, you can set Length again just before playback. This controls how long all four tracks take to play.

PoWer HintS

- **Take your time**
  Want to make some really slow changes? How about a gradual filter sweep that builds to a climax over several measures? Set a low Length for recording (for example, "*0.5*"), then before you play back the Pattern, set a high Length, such as "*8*."

- **Make it snappy**
  For really fast changes, just do the opposite of the above. Set a high Length for recording and a low Length for playback. Keep in mind that each track can be recorded with a separate Length.

Tech talK
Free EG Length

Determines the time of the Free EG — for both recording and playback. Each track can be set independently for recording; however, the playback setting affects all tracks together. Since Free EG is based in measures, changing the playback bpm (tempo) automatically changes the actual time of the Free EG as well. To set, press [LENGTH] repeatedly.

Settings
0.5, 1, 1.5, 2, 3, 4, 6, 8 (measures)

Pattern Power Tips

It's time to put your DX200 know-how and experience to work — and delve into these Pattern Power Tips.

The first couple of Tips introduce you to some important tools for working with the Patterns, such as copying and erasing data. They're basic nuts-and-bolts stuff, but don't ignore them. You'll need them for the fun things to follow — like creating your own original Patterns!

Tip 51 Hit the top of the Pattern!

Here's an effect that's long been a staple in dance and techno music. The Top function lets you instantly retrigger the entire Pattern from the top — so you can produce all those cool stutter effects and create awesome dynamic hits and accents.

Select and start a Pattern. Then, while the Pattern is playing, hold down [SHIFT] and hit the red Record ([TOP]) button.

SHIFT ✛ **TOP**

Keep holding [SHIFT] while you hit (press and release) the Record button.

Play the button in time with the rhythm, on every beat — like this:

ONE   two   three   four

Watch your timing and keep the beat! Of course, you can get different effects by playing the button way ahead or way behind the beat, if you want. (We'll show you some fancy rhythmic tricks with this in later Tips, too!)

Still, it's best to hit the button right on the downbeats ("one," "two," "three," and "four"), and stay in the groove. When you've got it right, you'll feel it.

📖 Tech talk

Top

Instantly returns to beginning (top) of Pattern during playback. Ideal for creating "stutter" effects, partial measures, hits, and accents.

While Pattern is playing, hold down [SHIFT] and press red Record (TOP) button. Release button and repeat for each time you want Pattern to start from the top.

Tip **52** **Shake, Retrigger, and Roll!**

In Tip 51, you saw how to use the Top function to play your own stutter hits. Here's a nifty variation on that function — it's called Retrigger & Roll.

Retrigger & Roll does just as its name suggests. It retriggers notes of the Synth track, and repeats them — like a drum roll.

Select a Pattern and start it up. As the Pattern's running, hold down [SHIFT] and simultaneously press and hold the Start/Stop button.

Hear the "roll"? And did you notice how the Rhythm tracks keep chugging along, while the Synth track spins its wheels?

Try this function at various points in the Pattern — the top, the end, the middle — and listen to what happens. Just keep holding down [SHIFT], and press/hold the Start/Stop button at different points in playback.
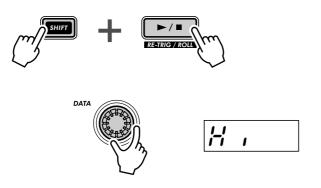
Keep in mind, Retrigger & Roll differs from Top in three important ways:
   1) It only affects the Synth track.
   2) It grabs and hits only a few notes — depending where in the Pattern you
       press the button.
   3) It automatically repeats the hits for you while you hold the button down.

You'll find that Retrigger & Roll is a slick way to break the rhythm up a bit, without losing the flow. It's also great for throwing hip, "what-was-THAT?" glitches and stutters into your tracks.

Retrigger & Roll has three different settings. To change the setting:
   1) Keep the Roll going (simultaneously hold down [SHIFT] and Start/Stop
       button).
   2) Grab the DATA knob. Make sure you keep holding [SHIFT] and Start/
       Stop — and turn the knob to change the setting.

While the Pattern is cycling, hear how the different settings affect the sound. And try changing the settings in time with the Pattern as well. There are a lot of cool rhythmic tricks you can create — just by hitting different settings on the beat.

📖 *Tech talK*
Retrigger & Roll

During Pattern playback, this stops the Synth track at the point of execution and loops one, two, or four notes (depending on the Roll type below). The Rhythm tracks are not affected. While a Pattern is playing, simultaneously hold [SHIFT] and press/hold the Start/Stop button.

Roll Types
Determines how many notes are used for Retrigger & Roll — one, two, or four. The more notes used, the slower the roll effect.

While the Pattern is playing and while holding down both [SHIFT] and the Start/Stop button, use the DATA knob to change the setting.

  Settings
  Lo (Lo)
    One note or step (corresponds to 16th
    notes).
  Mid (Mid)
    Two notes (corresponds to two 16th
    notes, or half of a beat). However, when
    Beat (page 18) is set to "12," this
    becomes three notes.
  Hi (Hi)
    Four notes (corresponds to a full beat in
    a measure).

Roll Types (in Utility)
The default Roll setting can also be changed from the Utility parameters. Hold down [SHIFT] and press button [16], repeatedly if necessary, until "*roLL*" appears in the display. Use the [DATA] knob to change the setting. (Settings are same as above.)

Tip 53 **Selecting a Voice (Copy Voice)**

One important step you can take in creating a Pattern is to select the Voice you'll be using for it.

Keep in mind that each Pattern includes a Voice, and that strictly speaking, Voices CANNOT be selected separate from their Patterns. However, this function lets you select a Voice that you like from one Pattern, and copy it to another Pattern.

1 First, select the source Pattern — the one that has the Voice you like.

2 Simultaneously hold down [SHIFT] and press [12] (COPY SEQ/VOICE).
You may have to press the button more than once to call up the "*CPYc*" display.

3 Next, select the destination Pattern.
This is the Pattern you'll be copying the Voice to. Use the DATA knob.

4 Copy the Voice.
The [12] button should be flashing. Press it once again (the button stops flashing and stays lit). At the "*YIIn*" ("Yes or no?") prompt, press it a third time to actually copy the Voice to the selected Pattern number, or press [EXIT] to cancel.

> 📖 **Tech talK**
> **Copy Voice**
>
> Allows you to copy a Voice from one Pattern to another. Select the source Pattern, then use [SHIFT] and [12] to call up "*CPYc*" (Copy Voice). Select the destination Pattern, and press [12] twice to execute.

Tip 54 **Starting a Pattern on a different note**

Here's an interesting way to change the character of a Pattern — without actually changing any of the notes! The Move Note function simply lets you start playback from any individual step in the Pattern.

For example, in a 16-step Pattern, selecting a value of "*- 4*" moves the Pattern "back" four steps — making Step 5 the starting point of the Pattern.

1 While the Pattern is stopped, simultaneously hold down [SHIFT] and press [13] (MOVE/PITCH).
You may have to press the button more than once to call up the "*NocE*" (Move Note) display.

2 If you want, select the particular track (Synth or Rhythm) you want to move.
Each track can be set independently — just hold down [SHIFT] and press the appropriate number button [1], [2], [3], or [4].

3 Release [SHIFT] and press [13] once again (the button stops flashing and stays lit).
At the "*YIIn*" ("Yes or no?") prompt, press it a third time to actually change the value, or press [EXIT] to cancel.

4 Start the Pattern to hear the changes you've made.

> 🔍 **X-tra Details**
>
> • Keep in mind that any changes you make to the Pattern with this function are cumulative. For example, if you change the setting by -4, then make a second setting of -3, the actual value (compared to the original Pattern) will be -7.
> • This CANNOT be used while the Pattern is playing back.

> 📖 **Tech talK**
> **Move Step**
>
> Determines the starting step of the Pattern, shifting the Pattern back or forward by the specified number of steps. All steps of the Pattern play as normal; only the starting point changes. Use [SHIFT] and [13] to call up "*NocE*" (Move Step). If desired, select the track to be moved; hold down [SHIFT] and press the appropriate number button [1], [2], [3], or [4]. (Skipping this step automatically selects all tracks.) Use the DATA knob to change the value and press [13] twice to execute.
> **Range**
> -15 — 0 — 15 (steps)

Tip *55* **Transposing the pitch of a Pattern**

Try this cool editing tool on your tracks. The Transpose Pattern function lets you change the overall key (pitch) of a Pattern — including the Rhythm tracks. Shift the pitch way up, or bring it way down — there's a lot of range here to work with.

1 While the Pattern is stopped, simultaneously hold down [SHIFT] and press [13] (MOVE/PITCH).

You may have to press the button more than once to call up the "*PtCH*" (Transpose Pattern) display.

2 If you want, select the particular track (Synth or Rhythm) you want to transpose.
Each track can be set independently — just hold down [SHIFT] and press the appropriate number button [1], [2], [3], or [4].

3 Set the pitch change of the tracks by using the [DATA] knob.
The pitch change value is in semitones. (There are 12 semitones in an octave.) For example, if the original Pattern is in the key of C, a setting of "*5*" would change the key to F.

Keep in mind that this changes the pitch of the Rhythm tracks as well as the Synth track.

4 Transpose the Pattern.
Press [13] (the button stops flashing and stays lit). At the "*Y/n*" ("Yes or no?") prompt, press it again to actually change the value, or press [EXIT] to cancel.

5 Start the Pattern to hear the changes you've made.

X-tra Details

• Keep in mind that any changes you make to the Pattern with this function are cumulative. For example, if you change the setting by -4, then make a second setting of -3, the actual value (compared to the original Pattern) will be -7.

• This CANNOT be used while the Pattern is playing back.

Tech talk
Transpose Pattern

Determines the overall key of the Pattern, shifting all notes in all tracks of the Pattern up or down in pitch by the specified number of semitones. Use [SHIFT] and [13] to call up "*PtCH*" (Transpose Pattern). If desired, select the track to be transposed; hold down [SHIFT] and press the appropriate number button [1], [2], [3], or [4]. (Skipping this step automatically selects all tracks.) Use the DATA knob to change the value and press [13] twice to execute.

Range
-24 — 0 — 24 (semitones)

Tip *56* **Copying a Pattern (Sequence)**

Earlier in this section, in Tip 53, you learned how to copy a Voice from one Pattern to another. Here you'll learn how to copy a Sequence (the Pattern's notes) from one Pattern to another.

1 First, select the source Pattern — the one that has the Sequence you like.

X-tra Details

The word "Sequence" is used here to describe the recorded notes or steps of a Pattern. ("Pattern" actually is a blanket term that refers not only to the recorded notes, but the Voice, the Scenes, and the Free EG settings as well.)

2 Simultaneously hold down [SHIFT] and press [12] (COPY SEQ/VOICE).

You may have to press the button more than once to call up the "*CPYS*" (Copy Sequence) display.

3 Next, select the destination Pattern.
This is the Pattern you'll be copying the Sequence to. Use the DATA knob.

4 Copy the Sequence.
The [12] button should be flashing. Press it once again (the button stops flashing and stays lit). At the "*YUn*" ("Yes or no?") prompt, press it a third time to actually copy the Sequence to the selected Pattern number, or press [EXIT] to cancel.

Tech talK

Copy Sequence

Allows you to copy a Sequence from one Pattern to another. Select the source Pattern, then use [SHIFT] and [12] to call up "*CPYS*" (Copy Sequence). Select the destination Pattern, and press [12] twice to execute.

Pattern Recording

By this point, you've built up a lot of experience twisting and tweaking the Voices, and playing around with the Patterns. Now it's time to strike out on your own — and create some Patterns yourself. Let's get started...

Tip *57* Erasing a Pattern – and starting from scratch

The first thing you'll need to do when you make your own Pattern is to make room for it on the DX200. To do that, you'll have to erase or clear one of the factory preset Patterns.

Don't worry, you won't be permanently erasing this Pattern. All this operation does is give you a blank slate on which to create your own Pattern. You can restore the original Pattern by simply re-selecting it (with the [DATA] knob), or by turning the DX200 off and back on again.

1 Select the Pattern to be cleared.

2 Simultaneously hold down [SHIFT] and press [11] (CLEAR SEQ).

The button flashes, and "*CLr*" (Clear) briefly appears in the display.

X-tra Details

We've labeled this function "CLEAR SEQ" (Clear Sequence) on the panel to distinguish it from the DEL PTN (Delete Pattern) function, at button [10].
   Clear Sequence — Deletes the note data from a Pattern.
   Delete Pattern — Deletes the Pattern number from a Song (see Tip 90).

---

3 Release [SHIFT] and press [11] once again.
The button stops flashing and stays lit; the display prompts you by asking "Yes or no?" ("*YIIn*"). Press it a third time to actually clear the Pattern, or press [EXIT] to cancel.

PoWer HintS

• **Tweak an existing Pattern**
Naturally, if there's a preset Pattern you like and simply needs a bit of tweaking to fit your specifications, you don't need to completely clear the Pattern — just edit it, using the tools described in Tip 60, Step Recording.

Tech talK
Clear Sequence (Pattern)

Allows you to clear the note data of a Pattern. Select the Pattern, then use [SHIFT] and [11] to call up "*CLr*" (Clear). Press [12] twice to execute.

Tip *58* Setting the Metronome lead-in

When you record your parts in real time, you'll need a rhythmic guide — a metronome click — to lead you into the recording, and keep you in time. Here, you can set the length of the Metronome lead-in — in other words, how long the Metronome clicks before Real-time recording actually starts.

1 Simultaneously hold down [SHIFT] and press [16] (UTILITY SETUP).

You may have to press the button more than once to call up the "*Ntro*" display.

2 Use the DATA knob to change the setting.

For a one-measure lead-in before recording starts, set this to "*on 1*." For a two-measure lead-in, set this to "*on2*."

You can also turn the Metronome off here, by setting this to "*oFF*" — in which case, recording starts immediately (without a lead-in), as soon as you press the Start/Stop button.

When done, press [EXIT] to return to normal operation.

Tech talk

Metronome

Determines the length of the Metronome lead-in for Real-time recording. To turn the Metronome (and the lead-in) off, set this to "*oFF*." Set this to "*on 1*" for a one-measure lead-in, and "*on2*" for two measures.

Metronome is set in the Utility parameters. Hold down [SHIFT] and press button [16], repeatedly if necessary, until "*Ntro*" appears in the display. Use the [DATA] knob to change the setting.

Settings

oFF
　No lead-in metronome click.

on 1
　A one-measure lead-in before recording.

on2
　A two-measure lead-in before recording.

Tip *59* **Recording a Pattern in real time**

Up until this point, you've been working with the preset Patterns of the DX200. Now, here's your chance to create some Pattern magic yourself — by recording your own original Patterns.

We'll give you the basic procedure to get you started. You supply the creative ideas and talent. And the DX200 will provide the sonic horsepower you need to produce some truly hip and happening tracks.

1 Select a blank Pattern — a clean slate for recording your own notes. (Have you cleared a Pattern for this yet? If not, go back to Tip 57 and do it now.)

2 Make the Beat setting for the new Pattern: 16, 12, or 8.
Hold down [SHIFT] and press [SWING] (BEAT). Then, turn the DATA knob to change the setting.

You should make this setting BEFORE recording, since it determines the number of steps you'll have available in the Pattern.

A setting of " *16*" gives you sixteen steps or spaces you can record notes to; a setting of "*8*" is obviously half that — eight steps. The " *12*" setting gives you twelve steps, of course, but also lets you create a triplet feel — count: "ONE, two, three, TWO, two, three," etc.

3 Select the track for recording — Synth or one of the three Rhythm tracks. Press [SYNTH TRACK] for Synth, or [RHYTHM TRACK] (repeatedly) for Rhythm tracks 1, 2, or 3.

4 Set a comfortable bpm for recording.
Hold [SHIFT] and press the [TAP] button, then use the [DATA] knob.

Keep in mind, you can always change the bpm later. Right now, it's important to set the bpm so that it's fast enough to capture the feel you're after, yet slow enough to let you easily enter the notes. (Make sure to press [EXIT] when you're done.)

5 Press [KEYBOARD] to enable the DX200's keyboard.
Did you know you can use a MIDI keyboard to record the notes? If you've got one, see Tip 87 for info on setting it up.

6 Enable recording — press the red Record button.
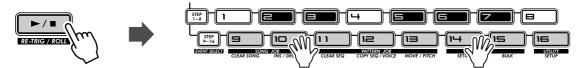
7 Start recording.

Now, let's get down to business. Press the Start/Stop button. While listening to the metronome, play the keys on the keyboard.

The DX200 has a nifty "Loop Recording" feature that immediately and automatically plays each note you record as the Pattern repeats (loops). This lets you hear the Pattern as you're recording — making it much easier to "feel" your way to a great recording.

What's more, the DX200 automatically corrects the timing of the notes you play. This may not always give you the results you expect — but it will ensure that ALL your notes play back in perfect sync with the rhythm.

8 Delete your mistakes or unwanted notes.

We know, you probably didn't make any any mistakes. But just in case you want to know, here's how you can patch up your tracks.

While the Pattern is still recording, simultaneously hold down [SHIFT] and press one of the Step buttons. (Again, avoid Step buttons [1], [4], and [8] — they won't have any effect.) Listen closely to the playback and press the appropriate Step button at the right time — right as the note plays. You can erase more than one note by continuing to hold down [SHIFT] and the Step button — for as long as you want to erase. Since it may be difficult to precisely erase the offending notes, try slowing down the bpm (page 17) during recording.

9 Stop recording.

Press the Start/Stop button.

10 Finally, save your precious work to the DX200's internal memory — with the Store function.

(Actually, you'll have to see page 79 for info on storing Patterns — we're running out of space here... Besides, the Store function deserves it's own Tip.)

PoWer HintS

- **Lay down the drums**
  Generally, it's a good idea to record your Rhythm track first. In fact, you may want to record just a very simple drum pattern to start with, and build up from there. You can later embellish that basic track, or even erase it and come up with an entirely new drum part — once your other tracks start to take shape.

- **Loop Recording**
  Take advantage of the Loop Recording feature and play just one note or sound at a time. For example, when building a Rhythm track, start out with just a kick drum sound (select octave C2 with [OCT <<], and press [9]) — and play it on the "one" and "three" beats. With the kick looping, play button [3] for a snare drum. Then, go back to octave C3 and use buttons [14] and [7] to add a rapid-fire hi-hat pattern.

  Get the idea? Keep building your tracks part by part in this way until you've got just what you want.

- **MIDI keys**
  Have you bought yourself a MIDI keyboard yet? One that's at least five octaves long, has touch sensitive keys, and features Pitch Bend and Modulation wheels? If you haven't, you're missing out on a very easy and powerful way to record! Just hook one up (see Tip 87) — and lay down your best keyboard licks.

Tech talK
Real-time Recording

Allows you to record the notes to a Pattern in real time, as opposed to entering them one-by-one (in Step recording; see page 72).

Select a blank Pattern and set the Beat (below). Select a track with [SYNTH TRACK] and [RHYTHM TRACK], and press [KEYBOARD]. Press red Record button to enable recording, then press Start/Stop button to start, and play the keyboard.

Tech talK
Beat

Determines the number of steps for the Pattern. Hold down [SHIFT] and press [SWING], and use the DATA knob to change.

Settings
16, 12, 8 steps

Tip 60 Step Recording

In Tip 59, you learned how to record a Pattern in real time, by playing the notes on the keyboard as the Pattern was looping. Now, you'll learn a completely different method — Step recording.

Real-time recording is like using a tape recorder — whatever you play is recorded as you play it. Step recording, on the other hand, allows you to enter each note individually — like writing down the notes on a sheet of music paper.

With Step recording, you not only enter the note itself (Pitch), but its length (Gate Time) and its loudness (Velocity) as well.

Step recording is ideal for precision — making the placement, rhythmic value, and velocity of each note exact and consistent. This is great for recording individual drum parts in a rhythm pattern, or single notes in a syncopated synth bass part. Step also gives you precise control in recording fast or complex passages that would be difficult or impossible to record in real time.

Last but not least, use Step Recording to edit Patterns. This is a great way to customize existing Patterns and tweak them to fit your needs — or twist them into completely new tracks.

There's a lot to be learned here, so take a deep breath — and dive in!

■ **Setting Up** •
The first three steps below show you how to set up a Pattern for Step Recording.

1 Select a Pattern and clear it.
Call up a Pattern that has the Voice you want to use for your new, original Pattern. Clear the Pattern by holding down [SHIFT] and pressing [11], then pressing only [11] twice again.

Remember that the Pattern isn't really erased — you can get it back by simply turning the DX200 off and back on again.

2 Make the Beat setting for the new Pattern: 16, 12, or 8.
Hold down [SHIFT] and press [SWING] (BEAT). Then, turn the DATA knob to change the setting.
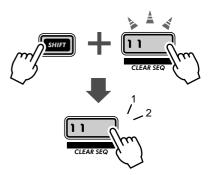
You should make this setting BEFORE recording, since it determines the number of steps you'll have available in the Pattern.

3 Here, you'll be recording the Synth part, so select the Synth track.
Press [SYNTH TRACK] (the button lights).

By the way, you can also step-record the Rhythm tracks — but we'll show you how to do that a little later on.

■ Entering the Notes ••

In this section, you'll be entering the notes (pitches) for each of the sixteen steps. We're going to show you a quick way to do this. The results here may not be very musical — but they'll get you started fast and point you in the right direction.

4 Turn all the Steps on.

In this condition, all the buttons are probably off. (Remember? You cleared the Pattern...) Go down the line, and press each button so that they are all lit.

Why do this? Generally, when you're recording the Synth track, it'll be easier to create a Pattern if all Steps 1 - 16 are on. This will create a busy Pattern, but you can always take out notes later.

5 While holding down [SHIFT], press [STEP 1-8].

Do this repeatedly, if necessary, to select Pitch entry.
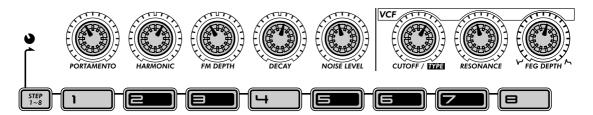
This operation actually accomplishes two things:
     1) It selects Steps 1 - 8 for recording.
     2) It selects the event type (in this case, Pitch).

Also, notice the flashing [1] button. This indicates that Step 1 is ready for recording.

6 Now, with the PITCH indicator selected, use the knobs above the buttons to set the Pitch for each Step, 1 - 8.

Each knob corresponds to the Step directly below it. For example, the PORTAMENTO knob controls entry for Step 1, the HARMONIC knob for Step 2, and so on.

Set the knobs (roughly) to the positions indicated above. No, you don't have to be exact. In fact, you can set these any way you want. We just figured that twiddling them around 11:00 to 1:00 is easy to do. You won't wind up with an earthshakingly memorable melody, but it should at least give you a listenable set of pitches to work with.

Notice that when you tweak a knob, the corresponding Step button flashes.

7 Now, let's work with Steps 9 - 16.

Press button [9].

We just showed you the fast way to select Steps 9 - 16 for editing:
     1) Edit Steps 1 - 8 first, then
     2) Press button [9] to edit the same parameter for Steps 9 -16.
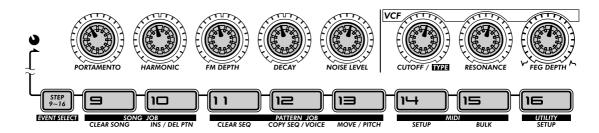
An alternate way is to hold [SHIFT] and press [STEP 9-16], repeatedly if necessary (like you did in instruction Step 5 above).

Enter the notes for these Steps in the same way as you did with Steps 1 - 8 above, but use the setting guide below:
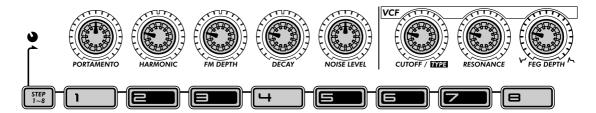
Again, this is ONLY a guide — make your own settings, if you want.

8 Finally, press the Start/Stop button — and hear your new masterpiece.

■ **Gate Time** •

In the next few steps, let's work with Gate Time and lengthen some of the notes.

9 Hold down [SHIFT] and press [STEP 1-8], until the GATE TIME indicator is lit.

10 Set the knobs as shown.

Set knobs [1] and [5] to around 12:00. (The display value should be around 200.)
Set knobs [2], [3], [4], [6], [7], and [8] to around 9:00. (The display value should be around $70 - 75$.)

11 Do the same again for Steps 9 - 16.

Press any one of the bottom row buttons (this automatically selects Steps 9 - 16 for editing the same parameter, Gate Time), then set the knobs to roughly the same positions as shown above.
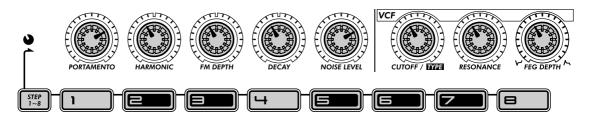
12 Press the Start/Stop button to hear your stunning new arrangement.

■ **Velocity** •

No matter what unnatural, machine-like melody you've programmed above, you can make it sound much better by putting in a few choice accents — with Velocity.

13 Hold down [SHIFT] and press [STEP 1-8], until VELOCITY is selected.

14 Maybe you've noticed that you can change any and all of the events while the Pattern is running. If you HAVEN'T noticed this, press the Start/Stop button to play the Pattern, and make the changes below.

15 Set the knobs as shown.

Set knobs [1] and [5] to around 2:00. (The display value should be around _90 - 100_.)
Set knobs [2], [3], [4], [6], [7], and [8] to around 11:00. (The display value should be around _40 - 50_.)

Or, make your own settings. After all, you've mastered the process now. Plus, since you can hear what you're doing — AS you're doing it — you can come up with some amazing ideas of your own.

■ **Step Mute** •
We've covered this function before (in Tip 29), but let's check it out again. It's a handy editing tool that helps you create great sounding tracks.

16 Is the Pattern still going? If not press the Start/Stop button again.

17 Press some of the Step buttons to mute certain Steps. Try out the examples below, then experiment with your own settings.

Press buttons [5], [7], [11], and [13]. Listen to the sound of the Pattern as these Steps drop out.

Now, turn them all back on and mute these: [6], [7], [12], [14], and [16].

You've got your basic Synth track — now, continue crafting and adding to the Pattern by working on the Rhythm tracks below.

PoWer HintS

- **Fine tuning**
  Here's a smart and easy way to work! Use the "Step" knobs (above each Step button) to select the Step and make a rough, 'round about' setting, then use the DATA knob to tweak and fine-tune the setting.

- **Swing**
  Don't forget to use Swing. It might not be right for all of your Patterns, but it doesn't hurt to try it out. A little Swing may be just what the doctor ordered... Remember, the Swing setting affects all tracks equally. (See page 37.)

- **Other tools**
  Feel like hearing a different Voice? Call up the Copy Voice function (page 65), and dial in a new Voice for your Pattern. Pattern Move (page 65) and Pattern Pitch (page 66) are also useful tools you can apply to your tracks.

- **Copy Pattern**
  If you've crafted a really hip Pattern, and you'd like to make a few more variations — use the Copy Sequence operation (page 67). Once you have some copies of the Pattern, you can tweak them and change them around, until you've got a whole palette of similar beats and riffs to work with — for live performance (page 95), or for Song recording (page 82).

- **Mix your methods**
  Real-time and Step recording are two separate methods — but they can also be used together. Not at the same time, of course, but in tandem. For example, you could record a basic beat to Rhythm Track 1 with Step, then use Real-time to improvise a bass line on the Synth Track. Or you could combine both methods on a single track — recording a basic part with Real-time, then using Step to edit it. Which method you use and how you use it depends partly on the type of music you wish to create and partly on your own personal preference.

Rhythm Tracks
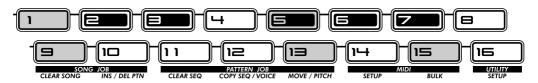
The DX200 is filled to the brim with an enormous variety of drum, percussion, and special effects sounds. Put these to good use with the Step Recording features — and create your own awesome beats and smokin' rhythms.

■ The Basics — Rhythm Track 1 ••••••••••••••••••••••••••••••••••••••

In the next few steps, we'll walk you through the basics — and give you a quick way to edit. Get these steps down, and you'll be whizzing through the tracks in no time.

18 Turn on the Steps you want to record.

Press the buttons shown to turn them on.
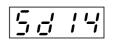
19 Select the Instrument Select parameter.

While holding down [SHIFT], press [STEP 1-8]. Do this repeatedly, if necessary, to call up Instrument Select. (The "INST SEL" indicator lights.)

Instrument Select is only available for the Rhythm tracks. As you may recall from Tip 11, the Rhythm tracks contain a huge variety of bass, drum, percussion and other sounds — each assigned to a different key. Instrument Select is the place you go to choose these sounds for Step recording.

Notice that a cryptic name appears in the display. This indicates the selected sound. For example, the display below indicates that Snare Drum #14 is called up.

$$\boxed{S\,d\ \ 14}$$

For a complete list of the sounds and their display abbreviations, see page 145.

20 Enter a bass drum sound for all the steps.

Press button [1], then hold down [SHIFT] and turn the [PORTAMENTO] knob to select "bd05." All steps 1 - 16 are instantly and automatically set to the same value.

Remember, you can use the [DATA] knob instead for finer control. Just press the appropriate number button, then tweak the [DATA] knob to dial up the desired sound.

Press the Start/Stop button to hear the new track — a bass drum pulse that will be the foundation of this new rhythm.

PoWer HintS In the Fast Lane — Working Smart

Once you get to know your way around the controls, you can Step Record your tracks fairly quickly. The trick is in getting the system down to a routine. So, here's the routine!

1) Select the desired track.
Press [SYNTH TRACK] or [RHYTHM TRACK].
2) Turn on the desired Steps.
Press the appropriate Step buttons, so that they light.
3) Call up the desired parameter.
Hold [SHIFT] and press [STEP 1-8] to call up Instrument Select, Pitch, Gate Time, or Velocity.
4) Press the desired number button and change the value.
Use the knob directly above it, or use the [DATA] knob.
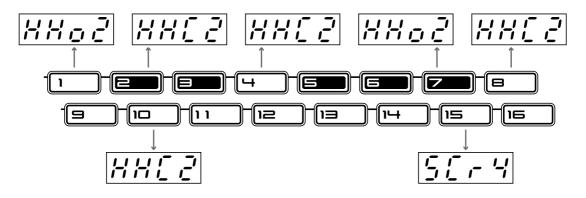
While editing you may want to turn other Steps on or off. To do this quickly and return to editing:
1) Press [EXIT] (to leave the current parameter).
2) Turn the desired Steps on or off.
3) Press [STEP 1-8] or [STEP 9-16] (to return to current parameter).

And remember — at any point in the operation, you can:
• **Select a different track.**
Press [SYNTH TRACK] or [RHYTHM TRACK].
• **Play the Pattern to hear your edits.**
Press the Start/Stop button.
• **Mute or un-mute individual tracks.**
Hold [SHIFT] and press [1], [2], [3], or [4].

■ Overdubbing the Hi-hat — Rhythm Track 2•••••••••••••••••••••••••

Now, let's flesh out the rhythm a bit with some hi-hat parts — and add a turntable scratch at the end.

21 Using the "In the Fast Lane" box above as a guide, go on to Rhythm Track 2, and make the settings as described here.
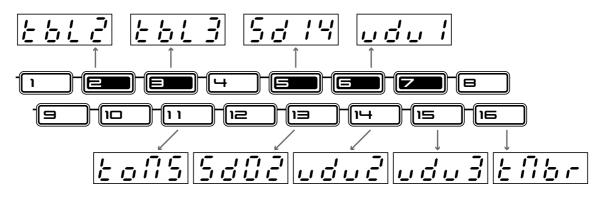
Turn the indicated buttons on and set them to the instruments shown.

HHo2	HHC2	HHC2	HHo2	HHC2

1	2	3	4	5	6	7	8

9	10	11	12	13	14	15	16

HHC2   SCr4

> **HINT** While you're programming the instruments, let the Pattern play. Hearing the sounds as you enter them is a great help in constructing hip tracks.

■ Snare and Ethnic Spice — Rhythm Track 3•••••••••••••••••••••••••••

For the final mix, we'll record a snare backbeat — and throw in some Indian tabla and other percussion for good measure.

22 Have you got the hang of the things by now? Use "In the Fast Lane" above as a cheat sheet if necessary, and program Rhythm Track 3 as shown.

tbL2	tbL3	Sd14	udu1

1	2	3	4	5	6	7	8

9	10	11	12	13	14	15	16

toNS	Sd02	udu2	udu3	tNbr

■ **Fine Tuning Your Tracks — Pitch, Gate Time, and Velocity** • • • • • • • • • • • • • •
Before you run off, remember that the Rhythm Tracks can be edited some more with the Pitch, Gate Time, and Velocity parameters.

23 We won't tell you exactly what to do – you can explore these on your own. However, here are some guidelines and paths to follow:

● **Pitch**
Yes, the drum and percussion sounds can be pitch-changed. So can all the scratches and sound effects. Everything's fair game and nothing's safe. This is your chance to go wild with the rhythm!

● **Gate Time**
Experiment with the length of each note — clipping some here, extending some there. Typical uses include stretching out the sound of a cymbal, so you hear the full decay, or cutting off the sustain of a tom sound, for a short, sharp chop.

● **Velocity**
Accentuate the positive. Bring out certain important instruments in the mix by boosting their velocities. Similarly, turn the velocity down for instruments that seem too loud.

24 Last and certainly not least – save your work.
Now that you have the slamming basic track for your new Grammy-winning, Platinum-selling Techno/Dance hit — you'd better save it. (For information on saving, see Tip 61.)

And that's it! Unless of course you want to go back and re-edit everything to your own exacting specifications. After all, you're the boss.

☼ PoWer HintS Rhythm Tracks

• **Start with the beat**
When you record a Pattern, it's best to start out with the Rhythm tracks. In fact, you might want to record just a temporary rhythm "scratch track" (for example, bass drum and snare) to Rhythm Track 1, and build the rest of the Pattern on top of that — erasing or modifying the scratch track later.

Of course, it's all up to you! Depending on what style of music you record and your own personal preferences, you may want to start with the Synth track instead.

• **Play with Gate Time**
Remember Gate Time can also be a "global" effect. Playing back the rhythm you've just programmed, mute the Synth track and experiment with different Gate Time settings. (Hold [SHIFT] and press [REVERSE]; use [DATA] knob to change.) Try settings of 30, 50, and 200 on all three Rhythm tracks — and hear what happens!

• **Swing**
For an instant hip-hop approach, try changing the Swing! While the Pattern is playing, press [SWING] and use the [DATA] knob to set the value to 65 or 70.

📖 Tech talK
Step Recording

Allows you to enter the notes to a Pattern in one-by-one, as opposed to recording them in real time (in Real-time Recording; see page 70).

1. Clear a Pattern and set the Beat (hold [SHIFT] and press [SWING]).
2. Select a track with [SYNTH TRACK] and [RHYTHM TRACK].
3. Turn all desired Steps on by pressing each Step button.
4. Simultaneously hold [SHIFT] and press [STEP 1-8] to select Steps 1 - 8 for editing; press repeatedly to toggle through event types. (Use [STEP 9-16] in the same way to select and edit Steps 9 - 16. Or simply press button [9] after editing Steps 1 - 8.)
5. With event type selected, use knobs above the Step buttons (and the DATA knob) to adjust value.
6. Turn steps on/off by pressing [EXIT] (to leave editing), then pressing appropriate Step button.
7. Press Start/Stop button to play back. (Can be done at any point in procedure.)

Tech talk Event Parameters — Synth and Rhythm Tracks

Pitch
Determines the pitch of the selected note. For the Synth track, this is expressed as note names; for the Rhythm tracks, it is expressed as number of semitone steps. (The small "o" in the note name display designates accidentals. For example, "G^o" corresponds to G♯.)

Range
C-2 — G8 (-64 — 24 for Rhythm tracks)

Gate Time
Determines the length of the selected note. The higher the value, the longer the note length. For sounds that have a short decay, higher values may have little to no effect.

Range
1 — 1600

Velocity
Determines the volume of the selected note. Use this parameter especially to create accents in the Pattern.

Range
0 — 127

Instrument Select
Determines the instrument sound for the selected note. This parameter is available only for the Rhythm tracks.

Range
(Refer to list on page 145.)

Tip 61 Storing your new Pattern

Now that you've created a new Pattern, you'll want to save it for future recall. The Store function lets you do this quickly and easily. And remember, any and all changes you've made to the accompanying Voice — including your knob and button settings, Free EG moves, and Effect edits — are stored with the Pattern, too.

The DX200 gives you 128 User memory spaces for saving your original Patterns.

⚠ **CAUTION**
Once you've created a Pattern (or Voice) you want to save, DO NOT select another Pattern until you've stored it. Selecting another Pattern (or Song) automatically wipes clean any changes or edits you've made!

■ **Turn Memory Protect Off** ••••••••••••••••••••••••••••••••••••••
Before you store, make sure the Memory Protect function is off. If it is on, you won't be able to store your Pattern.

1 Simultaneously hold down [SHIFT] and press [16] (UTILITY SETUP).
You may have to press the button more than once to call up the "$Prot$" (Memory Protect) display below.

2 If Memory Protect is set to on, use the DATA knob to change it to off ("oFF").
Unless you've changed the setting yourself, Memory Protect will probably be off.

■ **Store the Pattern**••
Storing your original Pattern is as easy as 1-2-3.

1 First, make sure your new Pattern is selected and that Memory Protect is off. Then, press [STORE]. ("P.Str" briefly appears to indicate the Store operation.)

STORE

2 Select the desired User Pattern number (1 - 128) with the DATA knob.

3 Press [STORE] again to actually store the Pattern, or press [EXIT] to cancel.

■ **Selecting User Patterns**•••••••••••••••••••••••••••••••••••••••
Now that your Pattern is properly saved to memory, you can call it up any time you want. Select it the same way you select the preset Patterns — pressing [PATTERN] and using the DATA knob. The User Patterns come after preset Pattern 256.

For a quick way to select User Patterns, hold down [SHIFT] and press the [PATTERN] button. This toggles between the Preset Patterns and the User Patterns.

PATTERN

SHIFT +

PoWer HintS

• **Save your Patterns in bulk**
If you have a sequencer or MIDI data filer, you can use the DX200's Bulk Send function (page 108) to save your valuable Pattern and Voice data in multiple "banks" of 128 Patterns. Load each bank of 128 back to the DX200 when you need it — or share your banks with your DX200-equipped friends and bandmates. Keep in mind too that you can use Bulk Send with the computer-based DX200 Editor (page 106) to further edit your Voices.

• **Make it a habit**
Did we mention that you should save? Save, save, and keep saving! Even if you're still working on a Pattern or Voice and don't consider it finished, save it anyway.

Why? Doing this gives you an archive of the changes you've made along the way — in case you want to call one of them up again. You can always delete those archive Patterns later (page 68) if you need extra memory space. Or, if you're a "pack rat," you can use Bulk Send (see hint above) to save every single thing you've ever created.

Tech talK
Memory Protect

Determines whether you can store Patterns to memory or not. Set this to ON when you want to avoid inadvertently erasing or replacing any previously stored User Patterns. Hold down [SHIFT] and press [16] until "Prot" (Protect) appears briefly in the display. Use the DATA knob to change the setting.

Settings
Off ("oFF"), On ("on")

Tech talK
Store Pattern

Allows you to save Pattern and Voice data to one of 128 User memory locations.

With the new Pattern still active and Memory Protect off, press [STORE]. Select the desired User number with the DATA knob, and press [STORE] again to execute, or press [EXIT] to cancel.

Song Recording

You've got a humongous selection of Patterns at your disposal. It's time now to put them together and make some Songs.

Tip **62** **Erasing a Song – and starting from scratch**

The first thing you'll need to do when you create your own Song is to make room for it on the DX200. To do that, you'll have to erase or clear one of the existing Songs.

1 Make sure the Song mode is selected.
Press the [SONG] button.

SONG

Indicates Song mode is active.
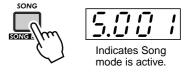
2 Select the Song to be cleared.
Make sure that it's a Song you don't mind getting rid of. Actually, this doesn't really erase the Song right away. The Song data still stays in memory — until you save your new Song to that number.

3 Simultaneously hold down [SHIFT] and press [9] (CLEAR SONG).

SHIFT + 9 CLEAR SONG

4 Clear the Song.
Release [SHIFT] and press [9] once again (the button stops flashing and stays lit). At the "*YI/n*" ("Yes or no?") prompt, press it a third time to actually clear the Song, or press [EXIT] to cancel.

PoWer HintS

- **Don't erase… Edit a Song!**
  Remember, you don't need to put a Song together from scratch. If there's a preset Song you like and simply needs a little customizing to make it your own, just call it up and edit it instead. Take Patterns out, put new Patterns in, and perform a variety of transformations on the Pattern data — the info starts on page 84.

Tech talK
Clear Song

Allows you to clear Pattern assignments and other edits of a Song. (Remember, this does NOT affect the actual data of any Patterns.) Select the Song, then use [SHIFT] and [9] to call up "*CL r*" (Clear). Press [9] twice to execute.

Tip *63* **Creating a Song**

Finally, we come to the culminating feature of the DX200. This is the place where you bring together all the Voices, Scenes, Free EG moves and Patterns you've made — and use them to create your own original Songs.

1 Call up the Song mode and clear a Song.
Give yourself a blank slate for putting together your own Song. (Have you tried clearing a Song yet? If not, go back to Tip 62 and do it now.)

2 Call up the Song Edit mode.
You'll need to enter the Song Edit mode to do any Song recording or editing. To do this, simultaneously hold down [SHIFT] and press the [SONG] button.

The PATTERN indicator should flash. If PATTERN is NOT flashing, press [PATTERN SELECT] to get it flashing and enable Pattern number entry.

3 Select the measure to which you want to record.
Simultaneously hold down [SHIFT] and use the [OCT <<]/[OCT >>] ([BWD]/[FWD]) buttons to move forward or backward in the Song, measure-by-measure.

Also, try this alternate method below — and move more quickly and easily through the measures.
> **1) Hold down [SHIFT] and press either of the [BWD]/[FWD] buttons.**
> **2) Then, release the buttons, and use the [DATA] knob.**

In this condition, turning the [DATA] knob steps through the measures. For even speedier selection, hold down [SHIFT] while turning the [DATA] knob — and jump through the Song ten measures at a click.
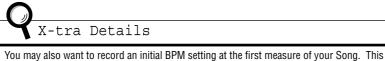
4 Press the Start/Stop button.
Doing this loops the currently selected Pattern at the currently selected measure. This allows you to hear your Song edits in the steps below — in real time.

If you want, you can stop playback by pressing the Start/Stop button before going on to Step 5 below. Or keep it going and continue editing while the Pattern loops.

5 Select the Pattern number to be assigned (to the measure selected above).
Use the DATA knob. Any of the Patterns can be selected — Preset or User. Remember that you can easily switch between the Preset Patterns and the User Patterns by holding down [SHIFT] and pressing the [PATTERN] button. (See page 80.)

X-tra Details

You may also want to record an initial BPM setting at the first measure of your Song. This determines the basic tempo for the entire Song. For more information, see Tip 64.)

6 Keep assigning Patterns in this way, repeating Steps 3 - 5 above, until you've created a new Song.

In most cases, you'll want to repeat a Pattern over several measures, rather than having a different Pattern every measure. To do this, first set the Pattern you want to repeat. Then, in the following measures, turn the DATA knob counter-clockwise until "- - - -" appears in the display.

This setting selects no new Pattern, and keeps the previous Pattern playing through the measures assigned this way.

By the way, if you're creating a Song from scratch, you may not need to enter "- - - -" at all. Just skip over the measures that you want to stay the same — the DX200 automatically repeats the last Pattern, until the next new entry.

7 To end the Song, record the "End" mark.

Select the measure FOLLOWING the final measure in the Song, then turn the DATA knob counter-clockwise until "End" appears in the display.

For example, if you recorded the "End" mark to measure 33, the Song plays up through measure 32, then stops.

8 Press [EXIT] (or the [SONG] button) to leave Song editing.

9 Play back your new Song by pressing the Start/Stop button.

However, you'll have to use the [BWD]/[FWD] buttons ([SHIFT] + [OCT <<]/[OCT >>] buttons) to select the starting measure. Make sure to return to the beginning measure — if you want to hear the Song all the way through.

10 Last and most important — don't forget to store your new Song.

Go on to Tip 68 right now and save your latest masterwork.

PoWer HintS

• **Recording other data**
In addition to Pattern numbers, a variety of other data types can be recorded to the measures of a Song — such as BPM, Gate Time, Swing, and Reverse. (See page 85.) These let you change various playback characteristics of the Patterns to suit your Song — without actually having to change the Pattern data itself!

Tech talK

Song Edit Mode

Call up this mode for recording and editing Songs. Hold down [SHIFT] and press [SONG]. (The "5" in the display indicates the Song mode.)

Tech talK

Measure Select

Determines the measure for recording, editing, and playback. Hold down [SHIFT] and use the [OCT <<]/[OCT >>] buttons.

Tip *64* **Setting the BPM (tempo) for your new Song**

In addition to the Patterns, a variety of other settings can be programmed into your Song. One of these is BPM. It lets you set the playback speed or tempo — for each and every measure, if you want.

Normally, you'll use this at the start of the Song (see Tip 63, Steps 3 - 5) to make sure the entire Song plays back at the proper tempo. However, it can also be used to change tempo in middle of the a Song as well.

Work through these steps, and master the procedure. You'll be using the same method in Tip 65 to program other settings, too.

1 **Enter the Song Edit mode.**
Hold down [SHIFT] and press the [SONG] button.

2 **Select the desired measure.**
Hold down [SHIFT] and use the [OCT <<]/[OCT >>] buttons.

3 **Play back the Pattern.**
Press the Start/Stop button to loop the Pattern at the selected measure.

4 **Call up the BPM setting.**
Hold down [SHIFT] and press [BPM] ([TAP]).

5 **Set the desired BPM value with the DATA knob.**

6 **Repeat Steps 2 - 5 above as often as you want, for as many measures as needed.**

In most cases, you'll want to keep the same BPM setting over several measures, or even over the entire Song. To do this, enter the "- - - -" setting for as many measures as needed. Or, if you're programming the Song from scratch, just skip over the measures that you want to stay the same — the DX200 automatically maintains the last setting, until the next new entry.

PoWer HintS

- **Fine tempo changes**
  The BPM value has an extremely fine resolution of 1/10 beats per minute — for precise control over the tempo. Use this to set up very gradual speed changes.

- **Speed up, slow down**
  If your Song fits the conventional verse/chorus structure, you might want to play around with changing the BPM at the beginning of each section. For example, some artists make their choruses slightly faster than the verses, to generate more excitement each time the chorus comes. Other songs might benefit from the completely opposite approach — slowing down the chorus to make it sound more dramatic.

  Whichever approach you take, make sure to keep the changes consistent from section to section, and keep them small — you want your listeners to FEEL the changes, not consciously HEAR them.

Tech talK
Song Edit — BPM (Tempo)

Determines the speed of Pattern playback (in beats per minute, or bpm), for the selected measure. First, select the measure by holding down [SHIFT] and using the [OCT <<]/[OCT >>] buttons. Then, hold down [SHIFT] and press [BPM] ([TAP]), and use the DATA knob to set the value.

Range
20.0 — 300.0 bpm
A setting of "- - - -" maintains the previous measure's value (no change).

Tip *65* **More Song editing features**

In Tips 63 and 64 above, you learned how to enter Pattern numbers and BPM values to the measures of your Song. But that's not all you can do. In this Tip, we'll show you how to use the rest of the powerful Song editing features in your tunes.

By the way, we'll keep these instructions to the bare-bones minimum. Read about these cool tools, then try using them in your own Songs and see what you come up with.

Remember, the basic method is the same for all:

1) Enter the Song Edit mode.
(In the Song mode, hold down [SHIFT] and press the [SONG] button.)
2) Select the desired measure.
(Hold down [SHIFT] and use the [OCT <<]/[OCT >>] buttons.)
3) Play back the Pattern.
(Press the Start/Stop button.)
4) Select the event type you want to edit.
(See instructions for each event below.)
5) Set the value.
(Use the DATA knob. In the case of Track Mute below, follow the relevant instructions.)

Naturally, repeat Steps 2 - 5 as often as needed. Press [EXIT] when you're done editing. And don't forget to store your new creation. (See page 89.)

Pattern
(Described in Tip 63 above.)

> *To select:*
> *Press the [PATTERN SELECT] button.*

Pitch Offset
Just as with the similar Pattern control (Transpose; on page 36), this lets you change the playback pitch. By making different settings throughout various measures in the Song, you can program your own chord progressions, and have the Patterns change key.

> *To select:*
> *Hold down [SHIFT] and press the [KEYBOARD] button.*
> *Both the [KEYBOARD] button and the PITCH lamp flash, indicating Pitch Offset is selected.*

BPM
(Described in Tip 64 above.)

> *To select:*
> *Hold down [SHIFT] and press the [TAP] button.*

Beat
This lets you change the total number of steps in the Pattern at the selected measure. (For details, see Tip 6.) One use of this would be to create a half-bar Pattern. For example, if you've entered a 16-step Pattern at the measure, setting this to "*8*" would effectively cut the Pattern in half. If you're only aiming for a brief change, remember to reset the Beat in the next measure or so!

> *To select:*
> *Hold down [SHIFT] and press the [BEAT] ([SWING]) button.*
> *Both the [SWING] button and the BEAT lamp flash, indicating Beat is selected.*

Swing

This lets you introduce a swing feel to the Pattern at the selected measure. (See Tip 27 for more information.)

To select:
Press the [SWING] button.

The [SWING] button lights, indicating Swing is selected.

Gate Time

This lets you control the length of the notes for the Pattern at the selected measure. (See Tip 25 for more information.) You could use this to create tracks in which the notes grow progressively longer as the Pattern cycles — by programming successively higher Gate Time values in the measures. Or have the notes become more and more clipped (staccato) — by making Gate Time lower and lower in successive measures.

To select:
Hold down [SHIFT] and press the [GATE TIME] ([REVERSE]) button.

Both the [REVERSE] button and the GATE TIME lamp flash, indicating Gate Time is selected.

Reverse

By setting this to Reverse ("*bACł*"), you can have the Pattern at the selected measure play backwards. (See Tip 25 for more information.) Alternate between forward and reverse Patterns for special effects. Or program three forward, one reverse — for an interesting four-bar phrase.

To select:
Press the [REVERSE] button.
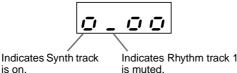
The [REVERSE] button lights, indicating Reverse is selected.
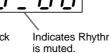
Track Mute

Add some texture to your Song with this function. By recording Track Mute events you can have tracks drop in and out of your arrangements, for exciting dynamic changes.

To select and edit:
Hold down [SHIFT] and press either the [SYNTH TRACK] or [RHYTHM TRACK] button. Then, press the appropriate Step button: [1] for the Synth track, and [2], [3], and [4] for the Rhythm tracks. The status for each track is shown in the display.

$$\square \_ \square \square$$

Indicates Synth track is on.   Indicates Rhythm track 1 is muted.

PoWer HintS

- **Easier way**
  Keep in mind — there is an alternate way to select the various event types. You may find it easier to remember — AND easier to use! Simply hold down [SHIFT] and press [SONG] repeatedly. This toggles through all of the event settings in order: Pattern Select, Pitch Offset, BPM (Tempo), Beat, Swing, Gate Time, Reverse, and Track Mute.

Tech talK
Song Edit — Event Select

This lets you select the particular event to be recorded or edited in a Song. Eight event types are available: Pattern Select, Pitch Offset, BPM (page 84), Beat, Swing, Gate Time, Reverse, and Track Mute. To select, make sure Song Edit mode is active ([SHIFT] + [SONG]), then press the appropriate button (using [SHIFT] if necessary). Alternately, hold down [SHIFT] and press [SONG] repeatedly to toggle through all eight event types.

Pattern Select
Press [PATTERN SELECT].

   Range
   P.001 — P.256 (Preset Patterns)
   U.001 — U.128 (User Patterns)

Pitch Offset
Hold [SHIFT] and press [KEYBOARD].

   Range
   -24 — 0 (no change) — 24 semitones

BPM
Hold [SHIFT] and press [TAP].

   Range
   20.0 — 300.0 bpm

Beat
Hold [SHIFT] and press [SWING].

   Range
   16, 12, 8 steps

Swing
Press [SWING].

   Range
   50 — 83

Gate Time
Hold [SHIFT] and press [REVERSE].

   Range
   1 — 200

Reverse
Press [REVERSE].

   Settings
   Forward (*For*)
   Reverse (*bACł*)

Track Mute
Hold [SHIFT] and press the [SYNTH TRACK] button or the [RHYTHM TRACK] button. Then, press [1], [2], [3], or [4] (for Synth track and Rhythm tracks 1 - 3). The mute on/off status for each track is shown in the display.

Tip *66* Adding Patterns to your Song – Insert Pattern

Naturally, you can add Patterns to your existing Songs — by using the Insert Pattern function. This puts a new Pattern in the Song at the measure you specify.

It doesn't matter whether you're in the Song mode or the Song Edit mode — you can insert a Pattern from either.

1 First, select the measure you want to insert the Pattern to, by holding [SHIFT] and using the [OCT <<]/[OCT >>] buttons.

2 Call up the Insert Pattern function.
Hold down [SHIFT] and press [10] (INS/DEL PTN). You may have to press the button more than once to call up the " *ın5*" (Insert Pattern) display.

3 Next, select the Pattern you want to add to your Song. Use the DATA knob.
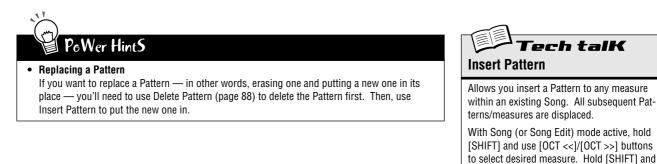
4 Insert the selected Pattern.
The [10] button should be flashing. Press it once again (the button stops flashing and stays lit). At the "*Ɏ11n*" ("Yes or no?") prompt, press it a third time to actually insert the Pattern to the selected measure, or press [EXIT] to cancel.

Take a look at the illustration below and see what happens when you insert a Pattern.

Measure 1	Measure 2	Measure 3	Measure 4
Pattern 012	Pattern 012	Pattern 013	Pattern 014

Pattern 144

Here, Pattern 144 is inserted to Measure 3, and all following Patterns are moved over to make space for the new Pattern.

Measure 1	Measure 2	Measure 3	Measure 4	Measure 5
Pattern 012	Pattern 012	**Pattern 144**	Pattern 013	Pattern 014

Don't forget to store your newly edited Song, or you'll lose any edits you've made once you turn the power off or select another Song or Pattern.

PoWer HintS

• **Replacing a Pattern**
If you want to replace a Pattern — in other words, erasing one and putting a new one in its place — you'll need to use Delete Pattern (page 88) to delete the Pattern first. Then, use Insert Pattern to put the new one in.

Tech talK
Insert Pattern

Allows you insert a Pattern to any measure within an existing Song. All subsequent Patterns/measures are displaced.

With Song (or Song Edit) mode active, hold [SHIFT] and use [OCT <<]/[OCT >>] buttons to select desired measure. Hold [SHIFT] and press [10] to call up " *ın5*" (Insert), select the desired Pattern number with the DATA knob, and press [10] twice to execute.

Tip *67* **Taking Patterns out of your Song – Delete Pattern**

If you've made a mistake in creating your Song, you can always clear it (page 81) and start over. Or you can use Delete Pattern to erase the offending entry, and keep the other Patterns intact.

Delete Pattern lets you take Patterns out of specific measures in your existing Songs. Keep in mind, however, it makes your Song shorter by one measure AND it doesn't leave an empty space — any Patterns that follow the deleted one move back to fill the vacated measure.

Delete Pattern can be used in either the Song mode or the Song Edit mode.

1 First, select the measure that contains the Pattern you want to delete.
Hold [SHIFT] and use the [OCT <<]/[OCT >>] buttons.

2 Call up the Delete Pattern function.
Hold down [SHIFT] and press [10] (INS/DEL PTN). You may have to press
the button more than once to call up the "*dEL*" (Delete Pattern) display.
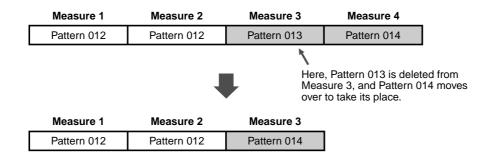
3 Delete the Pattern.
The [10] button should be flashing. Press it once again (the button stops flashing and stays lit). At the "*YIIn*" ("Yes or no?") prompt, press it a third time to actually delete the Pattern from the selected measure, or press [EXIT] to cancel.

Here's an example of what happens when you use Pattern Delete. In the illustration below, we'll delete Pattern 013 at Measure 3.

Measure 1	Measure 2	Measure 3	Measure 4
Pattern 012	Pattern 012	Pattern 013	Pattern 014

Here, Pattern 013 is deleted from Measure 3, and Pattern 014 moves over to take its place.

Measure 1	Measure 2	Measure 3
Pattern 012	Pattern 012	Pattern 014

Don't forget to store your newly edited Song, or you'll lose any edits you've made once you turn the power off or select another Song or Pattern.

Tech talk
Delete Pattern

Allows you delete a Pattern from any measure within an existing Song. All subsequent Patterns/measures move back to fill the vacant measure.

With Song (or Song Edit) mode active, hold [SHIFT] and use [OCT <<]/[OCT >>] buttons to select desired measure. Hold [SHIFT] and press [10] to call up "*dEL*" (Delete), and press [10] twice to execute.

Tip *68* **Storing your new Song**

Now that you've created and arranged a new Song, you'll want to save it for future recall. The DX200 gives you a total of 10 memory spaces for saving your original Songs.

⚠ *CAUTION*

Once you've created a Song you want to save, DO NOT select another Song and DO NOT leave the Song mode until you've stored it. Selecting another Song (or Pattern) automatically wipes clean any changes or edits you've made!

Delete Pattern can be used in either the Song mode or the Song Edit mode.

1 **Make sure Memory Protect is turned off.**
Hold down [SHIFT] and press [16] until the "*Prot*" (Protect) display is shown. Then, set Memory Protect to OFF with the DATA knob.

Press the [EXIT] button to leave Memory Protect.

2 **With your new Song still up and waiting, press [STORE].**
"*S.Str*" briefly appears to indicate Store operation.

STORE

3 **Select the desired Song number (01 - 10) with the DATA knob.**

4 **Press [STORE] again to actually store the Pattern, or press [EXIT] to cancel.**

PoWer HintS

• **Keep on saving**
Save ALL of your Songs — memory is cheap. If you have a sequencer or MIDI data filer, you can use the DX200's Bulk Send function (page 108) to save your valuable Song data in multiple "banks" of 10 Songs to disk — and build up a whole library of tunes.

However, make sure to save any relevant Pattern data with the Songs and load them together. If you don't do this, your Songs and Patterns may not match each other!

• **Song backup**
You may want to use Store to save different versions of your Song — even as you're working on it. This gives you an archive of the changes you've made along the way — in case you want to call one of them up again. You can erase the unneeded versions later if you want.

Tech talK
Store Song

Allows you to save Song data to one of 10 Song memory locations.

With the new Song still active and Memory Protect off, press [STORE]. Select the desired Song number with the DATA knob, and press [STORE] again to execute, or press [EXIT] to cancel.

Speed Tips for Power Users

Work smarter, not harder!

In this section, we'll show you some nifty ways to put your editing in high gear — so you can get MORE out of your DX200 in LESS time.

69 Using [SHIFT] with the [DATA] knob — for leaps and bounds!

Tip

The [DATA] knob is really useful for narrowing in on a value and fine-tuning the parameter settings. However, if you're in a hurry and want to quickly jump through the available values, it can be cumbersome.

Not when you use the [SHIFT] button, however. To speed up the [DATA] knob, hold down [SHIFT] while you turn it.

Use this operation especially:

- **For selecting Patterns**
  This speed operation lets you jump 10 Patterns for every click of the [DATA] knob.
- **For setting the BPM**
  Holding [SHIFT] lets you go 10 times faster through the BPM values (1 bpm/click).
- **For Instrument Select (in Step Recording, Rhythm Track)**
  Jump among the instrument selections, then take your finger off [SHIFT] and narrow your selection down.

Actually, this [SHIFT]-[DATA] knob shortcut is useful for just about ANY value-changing operation. Use it for the synth-related knobs, and use it to jump around on playback controls, such as Gate Time and Transpose.

Tip **70 Using [SHIFT] to "hold" a setting**

Editing on the DX200 is quick and easy — you press a button or turn a knob, and the setting/value changes. However, convenient as it is, there are times when you want to select a parameter without changing it.

Here's an example. Let's say you've selected the "hidden" Reverb Effect in your editing session, and you go on to edit something else. Wanting to come back to edit Reverb again, you press the EFFECT [TYPE] button. Whoops... You've just changed the Effect Type to Flanger!

To get around this, use [SHIFT]. Hold down [SHIFT], then press EFFECT [TYPE]. Doing this calls up the current Effect Type — without changing it.

Use this operation with ALL of the Voice "button" settings — such as LFO Detail, EG Select, Key Assign, and so on.

Tip **71 Gang-editing a group of Steps**

No, we're not advocating the use of violence here... This convenient Step Recording shortcut lets you change the setting for up to 16 Steps — instantly and all at the same time.

1 In Step Recording, select the desired parameter for editing: Pitch, Gate Time, or Velocity. (Or Instrument Select, if you're working on a Rhythm track.)

2 Select the Step row you want to start the group from.
For example, if you want to group Steps 5 -16 for editing, select row 1 - 8 (by pressing any button in this row). If you want to group-edit Steps 11 - 16, select row 9 - 16.

3 Hold down [SHIFT] and turn the knob corresponding to the first step in the group.
If you've selected the top row (1 - 8) in Step #2 above, this will instantly and automatically set all Steps 5 - 16 to the same value. If you've selected the bottom row (9 - 16), turning the NOISE LEVEL knob will set Steps 13 - 16 to the same value.

Typical uses of this include:
• Setting all Steps to the same instrument (in the Rhythm tracks).
• Setting all Steps to the same Velocity or Gate Time, then slightly tweaking individual Steps for variation.
• For when several Steps have the same value — you can set all Steps at once, then go back and change only the Steps you want to have different values.

Real World Tips

This chapter is a grab bag full of various practical tips that solidify your programming chops and put you on the way to truly mastering the instrument. You've seen all these features before. Now, try them out in these real-world examples — and explore some new, uncharted sound-shaping paths on your own.

Tip 72 Adjusting the Gate Time with the [DATA] knob

Gate Time is a simple, yet effective way to change both the sound and feel of a Pattern. Try this tip in real time, as the Pattern is playing — for dramatic, dynamic shifts.

1 Select and play a Pattern.

2 Call up Gate Time.
Hold [SHIFT] and press [GATE TIME] ([REVERSE]).

3 Tweak the [DATA] knob slowly to the left.
Very gradually, start turning Gate Time down — from 100, down to 40, 20, then even 10 or 1.

Hear what this does to all the tracks? Hear how everything — including the drums — is clipped, creating a tight, muted sound and producing a drop in dynamics.

4 Now, as quickly as you can, bring Gate Time back up to 60, 80 or 100 — or more.
Hold [SHIFT] while you turn the [DATA] knob — that lets you jump through the values, and instantaneously bring the dynamics back up. Try to do it right before the first beat of a measure — and kick everything back in on the "one."

Tip 73 Adjusting the pitch with the [DATA] knob

Let's do some more work with the [DATA] knob. This time we'll play around with the pitch — using the Transpose function.

1 Select and play a Pattern.

2 Call up Transpose.
Hold [SHIFT] and press [TRANSPOSE] ([KEYBOARD]).

3 While the Pattern is playing, use the [DATA] knob to bring the pitch up and down.
For wild pitch changes, hold down [SHIFT] while you work the knob. Try alternating on beat between two widely different values (for example, "*-20*" and "*30*"). Try also whipping the pitch way up in 60s range, then bringing down to the 40s. Try random pitch changes, too, as the Pattern cycles. Lots of fun stuff here!

Tip *74* **Changing the pitch with the keyboard**

As you saw in Tip 26, you can use the keyboard of the DX200 to change pitch and even create chord progressions on the fly. But you can get really wild and crazy with this feature, too — and come up with some truly mad techno mayhem.

1 Select and play a Pattern.
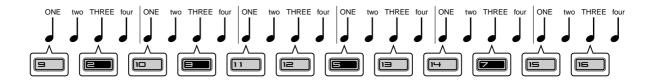
2 Call up Transpose.
Hold [SHIFT] and press [TRANSPOSE] ([KEYBOARD]).

3 Now, "play" the pitch changes from the keyboard.
Try out these specific exercises and see where they take you.
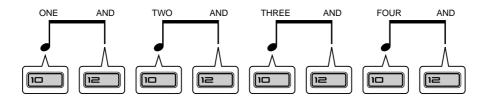
- Starting with button [9] (low C on the keyboard), go up chromatically — pressing each successive key in turn. Try it in rhythm, pressing a different key every other beat, like this:

ONE two THREE four | ONE two THREE four | ONE two THREE four | ONE two THREE four | ONE two THREE four | ONE two THREE four

| 9 | 2 | 10 | 3 | 11 | 12 | 5 | 13 | 14 | 7 | 15 | 16 |

Count "ONE-two-THREE-four," hitting the buttons on "ONE" and "THREE."

- Use the [OCT <<]/[OCT >>] buttons, too! Try selecting different octaves on the fly, and pressing various keys.

- Can you play a two-finger trill? (A trill is two notes played alternately — very quickly.) If you can't do it with one hand, try two. For example, alternate between buttons [10] and [12] (D and F), like this:

ONE AND | TWO AND | THREE AND | FOUR AND

| 10 | 12 | 10 | 12 | 10 | 12 | 10 | 12 |
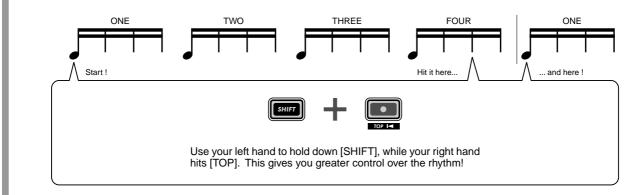
Here, you play two keys on every beat — count "ONE-AND-TWO-AND-THREE-AND-FOUR-AND," and hit each count.

Tip 75 Stutter fill-in 1
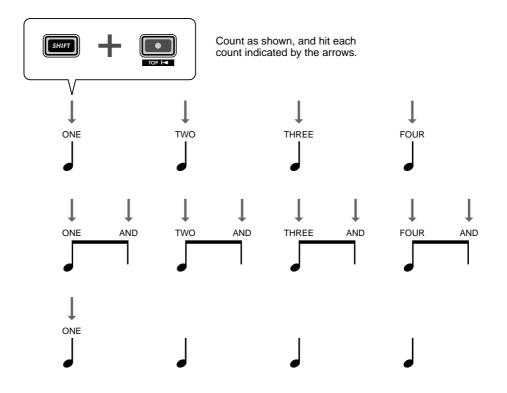
Remember in Tip 51 how you hit the top of a Pattern? In this Tip, and the two that follow, let's try some specific "stutter" rhythm examples.

Select and play a Pattern. Then, hold down [SHIFT] and hit the [TOP] (Record) button in the following rhythm.

ONE   TWO   THREE   FOUR   ONE

Start !   Hit it here...   ... and here !

SHIFT + **TOP ⏮**

Use your left hand to hold down [SHIFT], while your right hand hits [TOP]. This gives you greater control over the rhythm!
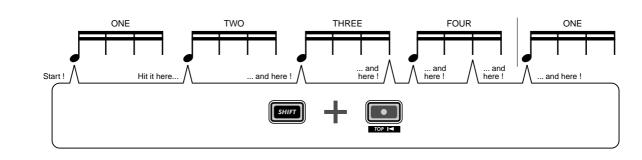
Tip 76 Stutter fill-in 2

Select and play a Pattern. Then, hold down [SHIFT] and hit the [TOP] (Record) button in the following rhythm. Use both hands. This one's a bit tricky...

SHIFT + **TOP ⏮**

Count as shown, and hit each count indicated by the arrows.

ONE   TWO   THREE   FOUR

ONE AND   TWO AND   THREE AND   FOUR AND

ONE

Tip *77* **Stutter fill-in 3**

Select and play a Pattern. Then, hold down [SHIFT] and hit the [TOP] (Record) button in the following rhythm. Use both hands on this one too. This could take a little practice before you nail it...

Tip *78* **Assigning Patterns for your gig**

When you perform live, you need to think quick and move fast. So keep things simple — and use this tip to help you streamline your onstage work.

You saw in Tips 3 and 31 how you can use the Pattern Select feature to instantly switch Patterns as you perform. If you've got a lot of Patterns to trigger during a performance, it makes sense to lay them out in the order you'll use them. That's what Pattern Assign is for.

First, make a list of the Patterns you'll need, in the order you'll use them. Then, go down the list and assign the appropriate Pattern to each number button. (Remember how? Hold down [SHIFT] and press [PATTERN ASSIGN], then press a number button and use the [DATA] knob to select the Pattern.)

Tip *79* **Chord progressions with Pattern Assign**

If you work with chord progressions, you can create copies of a Pattern select setup to different pitches, and play those Patterns from the keys.

Use the Copy Sequence function (page 67) to copy a Pattern several times. Then, edit each Pattern copy as needed with the Pitch function (page 66). Finally, use Pattern Assign (page 40) to assign the Patterns to the appropriate keys.

Keep things simple and logical. Assign a Pattern to the matching key. In other words, if your Pattern is in the key of C, assign it to button [9]. If the Pattern's in F, assign it to [12]. A Pattern in G would go to button [13], and so on.

Master Class 1 — Onstage

Now that you've got the hang of the instrument, it's time to start strutting your DX200 chops onstage. There are a lot of truly amazing things you can do with the DX200 — especially once you put it together with some other MIDI gear. Here are some ideas to get you started...

Tip *80* Sync the DX200 to your sequencer
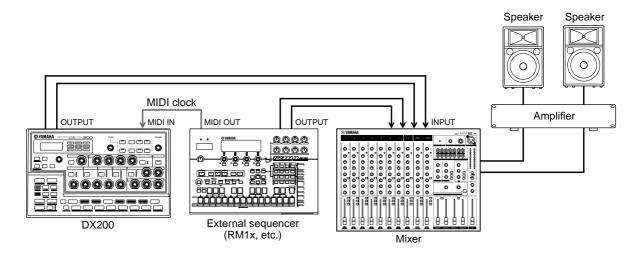
The sophisticated sync features of the DX200 let you lock it in step with the rhythm of just about any other MIDI device, such as a computer, rhythm machine or external sequencer. No drift, no glitching, no slipping out of sync — the two machines stay perfectly in the same groove.

This is great for live situations. For example, you could use a computer or sequencer for your main tracks and fly in some DX200 Patterns as you perform — while everything stays in perfect sync.

In this application, the sequencer is the "master," or controlling device, and the DX200 is the "slave."

1 Set up the DX200 and the sequencer.
Connect the two as shown with a standard MIDI cable.

2 Call up the Clock setting on the DX200.
Hold down [SHIFT] and press button [14] (MIDI SETUP), repeatedly if necessary, until "*CLot*" appears in the display.

$$\boxed{CLot}$$

3 Set Clock to "External."
Turn the [DATA] knob until "*Eit*" is shown.

$$\boxed{Eit}$$

4 Start song or sequence playback on the other device.

When you start and stop playback on the connected MIDI device, the Pattern or Song on the DX200 starts and stops at the same time. Naturally, you can change the bpm on the other device, and the DX200 will instantly and automatically follow right along.

If you want, you can use the DX200 as the master device. Just make sure the Clock on the DX200 is set to "Internal" — otherwise, you won't be able to start the Patterns or Songs from the DX200, nor control the other device. For settings on the other device, refer to the relevant owner's manual. (For an example showing the DX200 as the master, see Tip 83.)

📖 *Tech talk*
Clock

Sets the DX200 to either send or receive MIDI clock messages. This determines whether the DX200 functions as the master or slave in MIDI sync applications. When using the DX200 alone or to control a connected device, set this to Internal (" *int* "). When controlling the DX200 from a connected device, set this to External ("*EtE*"). Keep in mind, the Patterns or Songs cannot be started from the DX200 if this is set to External.

Hold down [SHIFT] and press button [14] (MIDI SETUP), repeatedly if necessary, until "*CLoF*" appears in the display, then use the [DATA] knob to make the desired setting.

Settings

int (Internal)
Sends MIDI clock messages, for controlling the sync of another device.

EtE (External)
Receives MIDI clock messages, for syncing to another device.

Tip *81* Changing the MIDI channels

In general, you won't need to fool with these settings. But they're here if you ever DO need them.

The four tracks of the DX200 — Synth and Rhythm 1 - 3 — are fixed to receive/transmit data over MIDI Channels 1 through 4, respectively. To match the tracks to a controlling MIDI keyboard or sequencer, you may have to change these settings. Each track also features an "off" setting, so you can disable a track's MIDI reception if you want.

Here, we'll show you how to change the MIDI Channel for the Synth track. The Rhythm tracks can be changed in the same way.

1 Hold down [SHIFT] and press button [14] (MIDI SETUP), repeatedly if necessary, until "*SY. 1*" appears in the display.

2 Change the channel with the [DATA] knob.

📖 *Tech talk*
MIDI Channel — Synth Track, Rhythm Tracks 1 - 3

Determines the MIDI channel over which the appropriate track receives/transmits MIDI data. Make sure the Channel of the desired track matches the Transmit Channel setting on the controlling keyboard or sequencer.

Hold down [SHIFT] and press button [14], repeatedly if necessary, until the desired setting is shown:

"*SY. 1*" — Synth Track (set to default of Channel 1)
"*r1.2*" — Rhythm Track 1 (set to default of Channel 2)
"*r1.3*" — Rhythm Track 1 (set to default of Channel 3)
"*r1.4*" — Rhythm Track 1 (set to default of Channel 4)

Use the [DATA] knob to change the value. The "- - - -" setting corresponds to "off."

Settings
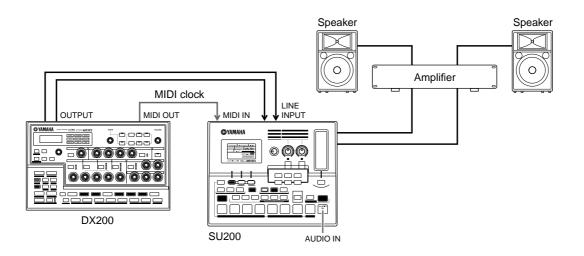
1 — 16, "- - - -" (off)

Tip 82 Loopfactory setup – with the SU200

As part of Yamaha's new Loopfactory series, the DX200 is not just a great analog-style synthesizer — it also excels in loop-based music production systems. In this Tip and the ones that follow, we'll take a look at some of ways you can use the powerful and versatile Loopfactory line to shake up the dance floor.

In this simple setup, the DX200 is paired with the SU200 Sampling Unit — a small phrase sampler with a special Loop Track feature that time-stretches your samples and keeps them all in sync.

Here, the DX200 is the controlling "master" and the SU200 is the "slave." (For more about masters and slaves, see Tips 80 and 83.) Make sure you set the SU200 to External Sync for this one (MIDI Clock in the Job mode). Naturally, the DX200 must be set to Internal Sync (page 96).

With this playback sync system, you can have the samples on the SU200 sync up perfectly to the Patterns of the DX200 — thanks to Loop Track Play. Use the the DX200 as a master "switch" for the whole system — starting the Patterns and the SU200 tracks simultaneously with the Start/Stop button. And as an added bonus, the SU200 serves double duty as an audio mixer — outputting the sound of both the DX200 and SU200.

Tip *83* Loopfactory sync system – with the AN200

In case you didn't know, the DX200 has a sister synthesizer — almost a twin sister, actually. The AN200 has many of the same sound-shaping controls, plus all of the Pattern and Song features that are found on the DX200.
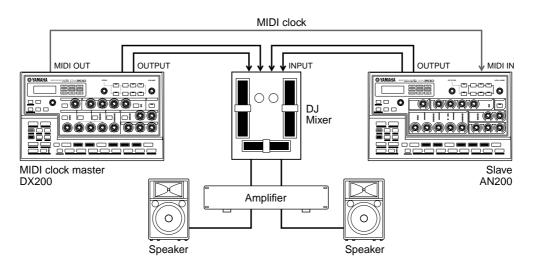
Yet, as similar as these siblings are, their actual sound is VERY different. The AN200 uses sophisticated Physical Modeling to authentically recreate the vintage analog synthesizer sound. It features fat, two-oscillator operation, a wide selection of basic waves, extensive modulation routings — plus, all the familiar sound-shaping controls you would expect on an analog synth. And, of course, absolutely stunning sound.

Side by side in a MIDI sequencing environment, these two give you the best of the analog and digital worlds, and provide an enormous amount of sonic versatility.

But even without a computer or sequencer, you can still get a lot out of these two units, especially in live performance situations — just hook them together and sync them up. With one as the "master" and the other the "slave," you can have them play their respective Patterns in perfect sync with each other. Add a DJ mixer, and you've got a compact yet powerful DJ setup for laying down some slammin' beats.

1 Connect the DX200 and the AN200 as shown.
Here, we'll use the DX200 as the "master," to control the AN200.

2 Set the Clock on the DX200 to Internal.
Hold down [SHIFT] and press button [14] (MIDI SETUP), repeatedly if necessary, until "*CLot*" appears in the display. Use the [DATA] knob to select " *int*."

3 Set the Clock on the AN200 to External.
Move over to the AN200 now. Hold down [SHIFT] on the AN200's panel and press button [14] (MIDI SETUP), repeatedly if necessary, until "*CLot*" appears in the display. Use the [DATA] knob to select "*Eæt*."

4 Select the desired Patterns on both the DX200 and the AN200.

5 Finally, press the Start/Stop button on the DX200.

If you've hooked everything up correctly and made the proper settings, both machines should go through their motions the instant you press Start/Stop on the DX200. Press it again, and they'll stop together on a dime.
Work the fader on your DJ mixer to switch between the two units as they play, to mix up your rhythms and create some truly happening tracks.

PoWer HintS

• **Syncing Songs**

Naturally, you can also play Songs on both machines in perfect sync with each other. For best results, you should make sure that:
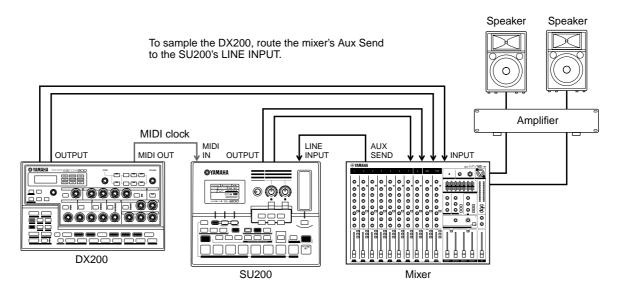
* The Songs on both the DX200 and the AN200 are of the same length.
* The Patterns on both machines work well with each other.
* Both Songs have the same Beat settings throughout.
* Both Songs don't deviate too much from each other in the Swing settings, either — unless you're aiming for some special, weird effects.

• **Bulk Send your music**

To help out in the Power Hint above, try using the Bulk Send function (page 108) to transfer Songs between the DX200 and AN200. For example, program a Song on the DX200, then transfer just the Song data to the AN200. Keep in mind, this will keep your Songs in sync — however, the Patterns on the respective machines could be wildly different. If you want to keep everything consistent on both devices, Bulk Send ALL the data from one machine to the other.

Tip *84* **Loopfactory sampling**

Here's a nifty little variation on Tip 82 above. First, hook up the outputs of the DX200 and the SU200 to an external mixer — to pump the sounds out to the crowd. Then, use the Aux Send on the mixer to feed the DX200 sound to the sampling input on the SU200 — and sample the Patterns of the DX200.

To sample the DX200, route the mixer's Aux Send to the SU200's LINE INPUT.
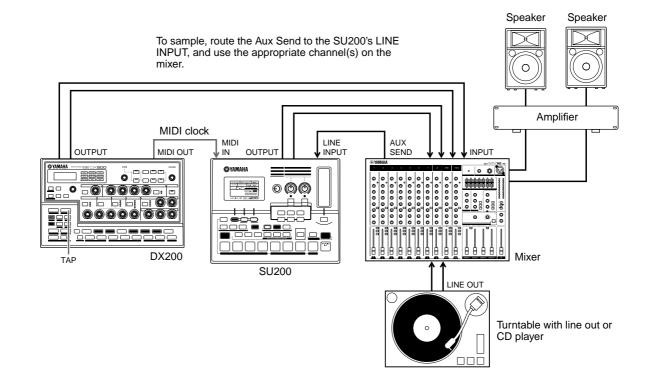
Things can get a little wild and wooly here. Naturally, this system lets you sync the SU200 to the DX200. However, the sampling function really makes this setup special. Sample some different DX200 Patterns to the SU200 and have the DX200 play one Pattern while you fly in samples of other Patterns — in perfect sync, of course. And use the real-time control features on BOTH machines to mess up your beats on the fly and create some chaos.

Be smart and do your sampling before you take the stage, so you have everything all set up. Or live dangerously, and sample your DX200 beats while you perform.

Tip *85* Full DJ system – turntable and all!

Bring the Loopfactory into your DJ setup — for the best of the analog and digital worlds. This builds on the setup in Tip 84 above by adding a turntable and/or CD player. (Make sure your turntable has line-level outputs, or that your mixer can boost phono signals.)

To sample, route the Aux Send to the SU200's LINE INPUT, and use the appropriate channel(s) on the mixer.

Use the Tap feature on the DX200 to sync both the DX200 and SU200 to your turntable beats. This is tricky to pull off — but if you get it in the groove, it can be pretty powerful stuff.
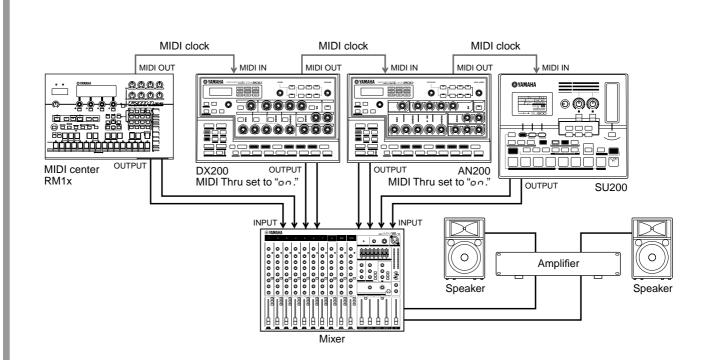
Do some sampling here, too. Sample your vinyl or CD beats to the SU200, and mix them in as you play. And sample the DX200, like you did in Tip 84. Have the DX200 play its Patterns while you fly in your new samples — without missing a beat.

Tip *86* Loopfactory megasetup – with MIDI Thru

Here's where you can take the Loopfactory to the max. Start the system with the RM1x Sequence Remixer, a mixer (you'll need at least eight input channels), and your DX200. Then bring the AN200 and SU200 into the fracas, and get things really smoking.

Use your sequencer data on the RM1x to play the Voices of the DX200 and AN200 (NOT the Patterns). This way you can take advantage of the special characteristics of each of these synthesizers — playing the FM sounds of the DX200 in 16-note polyphony, and the fat, analog sound of the AN200 in 5-note polyphony. Plus, with the SU200 locked in sync, you can play the samples on that unit using the Loop Track feature — and keep everything right in the pocket.

In this system, all the MIDI devices are connected in "daisy-chain" fashion. This setup trick can help when you find yourself with too many synthesizers — and not enough ways to connect them.

The key to making this work is the DX200's MIDI Thru function (see Tech Talk box below). MIDI Thru lets you change how the MIDI OUT terminal behaves, allowing you to chain together an additional tone generator or two to the DX200 — and have a connected computer or sequencer control the whole lot.

Make sure that you set MIDI Thru to "*o n*" for BOTH the DX200 and the AN200. In this condition, any data sent to and received via the DX200's MIDI IN termi-nal, is immediately and directly relayed to the MIDI OUT terminal — allowing the AN200 and SU200 to be controlled by the RM1x.

Tech talK

MIDI Thru

Determines whether the MIDI OUT terminal on the rear panel of the DX200 functions as a true MIDI Out, or is switched to function as MIDI Thru. When this is set to "on," any MIDI data received at MIDI IN is passed on without change to the MIDI OUT terminal. This allows you to connect other MIDI devices in"daisy-chain" fashion, and have the first device in the chain feed data to the oth-ers.

Hold down [SHIFT] and press button [14] (MIDI SETUP), repeatedly if necessary, until "*t H r u*" appears in the display. Use the [DATA] knob to change the setting.

Settings
On (*o n*)
Enables MIDI Thru operation (for the MIDI OUT terminal).

Off (*o F F*)
Enables MIDI Out operation (for the MIDI OUT terminal).

PoWer HintS

- **Sampling madness**
  For additional sonic mayhem, route the Aux Send on the mixer back to the SU200 input (as in Tips 84 and 85), and sample the Patterns of the DX200 and AN200.

- **The more, the merrier**
  Naturally, if you have other synthesizers with MIDI THRU terminals, you can extend the chain and have them join in on the fun. However, be careful not to "daisy-chain" too many devices in this way — otherwise a MIDI delay may result.

- **More instruments, more parts**
  If you're careful in setting the MIDI channels on all the connected devices, you can play several different, independent sounds on each device. For example, if you've connected a AN200 to the MIDI Thru (OUT) terminal, you should set the MIDI Receive Channels (page 97) on the AN200 to values different than the DX200. If the DX200 is set to receive over Channels 1, 2, 3, and 4, set the AN200 to receive over 5, 6, 7, and 8.

Master Class 2 — Advanced Music Production

Take your skills up to the next level. Explore these advanced operations and applications — and get the absolute most out of your DX200 in your home studio.
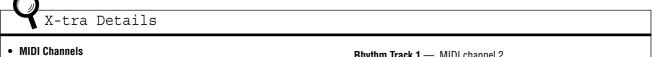
Tip 87 Playing the DX200 as a synthesizer

The DX200 is an extremely powerful and versatile synthesizer, with a wide variety of truly stunning and dynamic sounds. And one of the best ways to harness that power is to hook up a MIDI keyboard. Do this, and explore the wealth of Voices and the full 16-note polyphony of the DX200.

Setting up the keyboard couldn't be easier — just plug it in, and connect the MIDI OUT on the keyboard to the MIDI IN on the DX200.

DX200

MIDI keyboard

MIDI IN   MIDI OUT

To check that everything's set up properly, play the keyboard — you should hear the synth sound of the DX200. (If you don't, see "X-tra Details" below.)

X-tra Details

- **MIDI Channels**
  More than likely, your MIDI keyboard is probably set to send data over channel 1 — which will let you play and record the Synth track.

  However, if you want to play or record any of the Rhythm tracks, you'll have to change the channel on the keyboard to match the appropriate track:

  Rhythm Track 1 — MIDI channel 2
  Rhythm Track 2 — MIDI channel 3
  Rhythm Track 3 — MIDI channel 4

  You can also change these assignments on the DX200 — see Tip 81. For instructions on changing the MIDI channel of the keyboard, refer to the owner's manual of that instrument.

PoWer HintS

- **What keyboard should I get?**
  Naturally, any MIDI keyboard will do the job for you. As long as it's got keys (preferably both black and white) and a MIDI OUT terminal, you're in business.
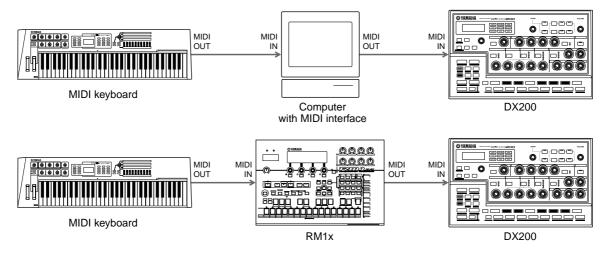
  However, to get the most out of your extraordinarily versatile DX200, you'll need an equally versatile MIDI keyboard. Here's what you should look for:

  * **Five-octave (61-key) keyboard** — There are some very good desktop keyboards (such as the Yamaha CBX-K1) that have fewer keys, but you'll probably want at least five octaves to play with... so you can use both hands.

  * **Velocity sensitivity** — This feature lets you control the dynamics of the sound by how softly or strongly you play the keyboard. Plus, it also affects the FEG, so you can add some filter bite just by playing harder. If you want expressive sounding tracks, there's really no substitute for this.

* **After Touch** — Another expression control, After Touch lets you change the sound (most commonly LFO modulation; Tips 32 — 35) by pressing down hard on the keys after you play them. A really good keyboard will let you change the MIDI Control Change assignment on this, so you can control anything you want — such as Cutoff or Effect Depth (Wet). (For details on MIDI Control Change messages, refer to the MIDI Data Format section in the Appendix.)

* **Pitch Bend and Modulation wheels** — Most keyboards have these. Pitch Bend lets you bend the pitch (obviously). The Modulation wheel usually affects the LFO, but on a good keyboard this too can be changed.

* **Extra (assignable) MIDI controllers** — This is a luxury item. If you can afford it, go for it. Some keyboards (such as the Yamaha CS2x) give you an extra set of knobs or faders that you can assign to many of the DX200's controls. (For more about MIDI controllers, refer to the MIDI Data Format section in the Appendix.)

Tip **88** **Recording to a sequencer**

As a "desktop" synthesizer, the DX200 is absolutely perfect for computer recording applications. In fact, if you DON'T have a computer or a hardware sequencer, you're leaving a good portion of the DX200's incredible potential untapped.

You've already worked with the step sequencer on the DX200 itself for recording Patterns and Songs. However, with a separate sequencer or a computer, you can take advantage of even greater recording power and editing flexibility. Use one of the example setups below to record songs to a sequencer and play them back with the sounds of the DX200.

MIDI keyboard   Computer   DX200
                       with MIDI interface

MIDI keyboard   RM1x   DX200

In the top example, the computer has a MIDI interface and is running sequencing software, such as XGworks lite — which you can find in the included CD-ROM. In the bottom example, the RM1x Sequence Remixer is used for recording.

A few important points:
- Make sure all MIDI connections are correct — the INs go to the OUTs, and the OUTs to the INs.
- Set the MIDI keyboard to match the receive channel of the DX200. (This may be controllable from the computer. You can also change the receive setting on the DX200; see page 97.)
- Make sure that MIDI Thru (or MIDI Echo) on the computer or sequencer is set to "on." This lets you hear the sound of the DX200 as you play the keyboard.
- Since the Synth Voices of the DX200 play on Channel 1, make sure that any recorded tracks on the sequencer are set to play via MIDI Channel 1.
- Remember that the DX200 has Rhythm tracks, and that you can use these in recording, too. Just be careful to make the correct channel settings. (The Rhythm tracks normally receive on Channels 2, 3, and 4. If you want to change these, see Tip 81.)

Other settings may be necessary as well; refer to the relevant owner's manuals.
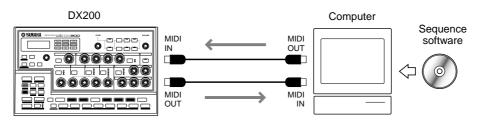
Tip *89* Recording DX200 knob moves to a sequencer

Have you got an external sequencer or computer? And are you using the DX200 as a synthesizer (as we covered in Tip 87) to play back your sequencer tracks? If so, here's a power-user Tip for you that will give you undreamed-of control over the sound.

Here, you'll learn how to record all your knob moves and button presses to your sequencer. Which means when you play back your song, all the changes you make to the Voice automatically play back, too. It's like having an second Free EG function (page 60) — but with an unlimited amount of tracks to work with.

The following procedure is a bit complicated — in that many of the instructions depend on the settings and capabilities of your particular sequencer, and how familiar you are with them. If you find yourself in deep water, refer to the relevant owner's manual.

1 Connect the DX200 and the external sequencer as shown.

2 Set up the sequencer appropriately for receiving the control data and for playing the DX200.

Specifically, make sure that:

- All MIDI channel settings are correct. The tracks for playing the DX200 should be set to the same MIDI channel as the Synth track. By default, the Synth track is set to receive over Channel 1, though this can be changed on the DX200 (see page 97).
- The track or tracks having note data are properly set to play, and that a new track (for the knob moves) is set to record.

3 While listening to the playback, tweak the knobs of the DX200.

If everything's been set up properly, every move you make will be recorded as Control Change data. (For information on the parameters and their corresponding Control Change numbers, refer to the MIDI Data Format.)

The DX200 also lets you choose between having a full parameter set for control, or a limited one. (See Tech Talk below.)

4 Stop the song and play it back to hear your recorded changes.

Go on to record more knob moves to additional tracks on the sequencer, if you want.

🔍 X-tra Details

- Any function called "MIDI Thru" or "MIDI Echo" on the sequencer is set to "off." If the sequencer's MIDI Thru is on, you could get unwanted double data.
- If you're recording the same knob to different tracks, you may want to mute previous tracks as you go along. Also, be aware that too many knob moves and button presses could clog the data flow and result in glitches or undesirable changes in the sound.

📖 **Tech talk**
Control Change In/Out

Determines whether the DX200 uses a limited set of parameters for sending and receiving Control Change data, or a full set. (For details on available parameters and their assignments, refer to the MIDI Data Format.)

Hold down [SHIFT] and press button [14] (MIDI SETUP), repeatedly if necessary, until "*CC io*" appears in the display. Use the [DATA] knob to change the setting.

Settings
norA (Normal)
Enables Control Change in/out for the limited parameter set.

ALL (All)
Enables Control Change in/out for the full parameter set.

Tip 90 Editing the DX200 from a computer
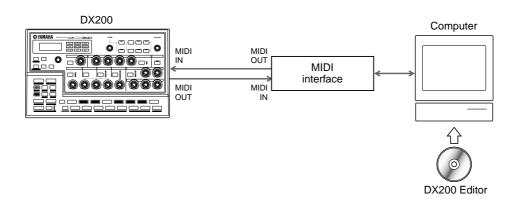
If you've worked through most or all of the Tips in this book, you can rightfully consider yourself a master programmer and expert user of the DX200.

Well, almost.

Actually, we hate to break it to you — but you've only scratched the surface of the enormous sound-shaping potential of the DX200...

This instrument is deep — much, much deeper than just what's available on the front panel. However, you can have all that editing power and depth right at your fingertips — with the DX200 Editor.

The DX200 Editor is special software that works on your Macintosh or PC-compatible computer. It allows you to directly edit all of the DX200 Voice settings and parameters — right from your computer. It's also extraordinarily intuitive, with a virtual front panel that gives you at-a-glance, full control over your DX200.

All the necessary software is contained in the included CD-ROM. For more information on installing the software to your particular computer, refer to page 112.

Tip *91*   MIDI sequencer controls – Start, Continue, Stop

This function gives you detailed control over how the DX200 handles MIDI sequencer control messages — Start, Continue, and Stop.

The major use for this minor function is to keep the DX200 from starting its own Patterns (or from starting a connected sequencer). This comes in handy when using the DX200 strictly as a tone generator in a larger MIDI system.

For example, if you are using the song data on a sequencer to play the DX200's Voices, you wouldn't want the Patterns to play when you clicked PLAY. Similarly, there may be times when you want to play a Pattern on the DX200, yet want to avoid starting the sequencer at the same time.

1 With the DX200 properly connected in a MIDI system, call up the MIDI Control setting on the DX200.
Hold down [SHIFT] and press button [14] (MIDI SETUP), repeatedly if necessary, until "*ΠΣ ᴴ Σ*" appears in the display.

2 Use the [DATA] knob to make the desired setting: On, Out, In, or Off.

See "Tech Talk" below for details on the settings.

📖 *Tech talK*
MIDI Control

Determines whether or not the DX200 receives and/or sends sequencer control (System Real Time) messages. The Start message (FA hexadecimal) tells a MIDI device to go to the beginning of its song and start playing. Continue (FB hexadecimal) is similar to Start, except that the device will play from the current location — not necessarily the beginning. The Stop message (FC hexadecimal) tells the device to stop playing the song.

Hold down [SHIFT] and press button [14] (MIDI SETUP), repeatedly if necessary, until "*ΠΣ ᴴ Σ*" appears in the display, then use the [DATA] knob to make the desired setting.

Settings

o n
Messages both sent and received; full control both directions.

o u t
Messages sent, but not received; DX200 starts and stops connected device, but cannot be remotely controlled .

ı n
Messages received, but not sent; DX200 can be remotely controlled, but will not affect connected device.

o F F
Messages neither sent nor received; no control either direction.
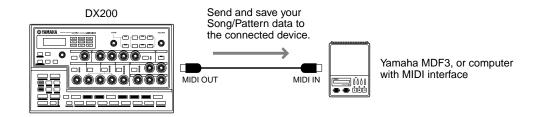
Tip **92 Saving Patterns and Songs to a MIDI data filer**

Another fantastic thing about MIDI is all the data storage options it gives you. With the use of a MIDI data filer (such as the Yamaha MDF3) or MIDI sequencing software (such as the included XGworks lite), you can save all your valuable Song and User Pattern data for future recall — any time you need it. Plus, you can amass a whole library's worth of Songs and Patterns on just a few floppy disks.

The technological magic that makes this possible goes by the mundane name of "Bulk Send." In this Tip, you'll learn how to use Bulk Send to save your precious data. Then in Tip 93 below, you'll learn how to load it all back to the DX200.

1 Set up the DX200 and the recording device.
Connect the two as shown with a standard MIDI cable.

Setting up the other device for recording data may involve some additional steps; refer to the relevant owner's manual for details.

2 Call up the Bulk Send setting on the DX200.
Hold down [SHIFT] and press button [15] (MIDI BULK).

3 Select the type of data to be saved – Pattern, Song, or All.
Continue to hold [SHIFT] and press button [15] repeatedly to select the desired type. To save all three data types, select "*ALL*."

4 Go back to the connected device and start recording.
This operation too may differ depending on your particular device. On most sequencing software (such as XGworks lite), this can be as simple as clicking the Record button.

5 Execute the Bulk Send operation.
Press the flashing [15] button once to enable Bulk Send, then once more to actually start the operation. (To cancel, press [EXIT].)

Tech talk
Bulk Send

Allows you to save Pattern and/or Song data of the DX200 to a MIDI data filer or sequencer.

Set up the DX200 and the recording device. Hold [SHIFT] and press button [15] (MIDI BULK), repeatedly if necessary, to select the desired data type. Start recording on the other device, then press [15] twice to send the data.

Settings
Pttn (Pattern)
Sends only User Pattern data (up to 128 Patterns) via MIDI OUT.
Song (Song)
Sends only Song data (up to 10 Songs) via MIDI OUT.
ALL (All)
Sends all three types of data above (Pattern, Song, System) via MIDI OUT.
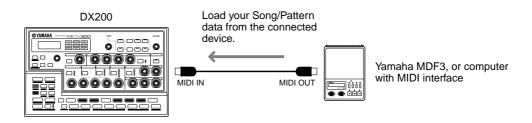
Tip *93* **Loading back your saved Patterns and Songs**

Once you've saved your valuable data, you can bring it all back to your DX200 — with this simple operation.

1 Set up the DX200 and the recording device.
Connect the two as shown with a standard MIDI cable.

DX200

Load your Song/Pattern data from the connected device.

MIDI IN   MIDI OUT

Yamaha MDF3, or computer with MIDI interface

Make the proper connections and make sure the connected device has the appropriate data on disk. (Setup for Bulk Send on the other device may involve some additional steps; refer to the relevant owner's manual for details.)

2 Make sure the DX200 is set to Pattern mode.
Press the [PATTERN] button if necessary.

⚠ **CAUTION**

BEFORE you load anything to the DX200, make sure you have no important unsaved data remaining on the instrument — it will all be erased in the operation! Best thing to do is use Bulk Send to first save the existing data (as a temporary file), then go ahead and load the data.

3 Start the Bulk Send (or other appropriate) operation on the connected device.
This operation too may differ depending on your particular device. On most sequencing software (such as XGworks lite), this can be as simple as clicking the Play button.

That's all there is to it! The DX200 automatically receives the data and loads it to the proper memory location.

PoWer HintS

• **Lifesaver for live applications**
Bulk Send is real handy for performers. If you're gigging and the DX200 is your main workhorse, you may need more than the 10 User Songs to get by. Fortunately, you can save your data in 10-Song banks (might as well save your Pattern data, too) — then load each bank as you need it, between sets.

• **Be a pack rat**
You really ought to save everything you've ever created on the DX200. Floppy disks are small and cheap, and you'll be glad you archived all your precious masterworks.

This index lets you quickly find information on the various functions and parameters of the DX200. All the references here are to Tip numbers, except for a few page references (for Tips that stretch over several pages).

About the Included CD-ROM

For Windows Me/98/95 Users

This CD-ROM contains the following;

• **Acrobat Reader 4.0**
• **XGworks lite V3.0A**
• **DX200 Editor**
   XGworks lite Plug-in software
• **PLG150-DX Preset Voice Files**
   These are Preset Voice Files for the PLG150-DX. These are
   compatible with the DX200, so can be edited with the DX200
   Editor.
   File names are "PlgDxP1.DX2" to "PlgDxP7.DX2."

Minimum System Requirement

XGworks lite V3.0A

OS:	Windows Me/98/95
CPU:	Pentium/75MHz or faster (Pentium/ 166MHz or faster is recommended)
Available Memory:	16MB or more (32MB or more is recommended)
Free space in Hard Disk:	30MB or more
Display:	800 x 600, 256 colors or more

Installing Softwares

■ Acrobat Reader 4.0 ••••••••••••••••••
You need to install Acrobat Reader to view the PDF manuals
accompanied with each application in advance.

> **NOTE** If you have installed an older version of Acrobat Reader on
> your PC, first you need to execute "Uninstall" before proceed-
> ing.

1 Double-click on the "Acroread" folder.
   Four different language folders will be displayed.

2 Select the language you want to use and double-click on its folder.
   "ar40***.exe" file will be displayed. ("***" indicates the
   selected language.)

3 Double-click on the "ar40*.exe."**
   Acrobat Reader Setup Dialog box will be displayed.

**4 Execute the installation by following the directions appear-
   ing on the screen.**

After completing the installation procedure, you will find the
Acrobat folder on your PC (Program Files as the default).
Refer to the [Reader Guide] in the [Help] menu how to use the
Acrobat Reader.

■ XGworks lite ••••••••••••••••••••••
In addition to sequencer function, XGworks lite can be used as
convenient voice editors once the Plug-in applications men-
tioned below are installed.

> **NOTE** PDF manual of the XGworks lite (entry version) is the same
> as the one for the XGworks. Please be aware that some of the
> windows/functions described in the manual are not available
> with the XGworks lite. Unavailable Windows/Functions Staff
> Window, Drum Window, Control section of Piano Roll Window,
> Printing of Staff Window, Plug-in software (Voice To score R,
> Auto Arranger, Guitar Arranger, SW1000XG Mixer, Auto Play,
> Importer) Jobs (Voice To score, XF Information Editor)

> **IMPORTANT** Although the PDF manual of the XGworks lite includes the
> explanations on the package contents and software installa-
> tion procedure, those are obsolete. Please refer to those of
> this Installation Guide.

1 Double-click on the "XGworks" folder.
   "Japanese" and "International" folders will be displayed.

2 Double-click on the "International" folder.
   Various files like "Setup.exe" will be displayed.

3 Double-click on the "Setup.exe."
   XGworks lite Ver.3.0 Setup Dialog box will be displayed.

**4 Execute the installation by following the directions appear-
   ing on the screen.**

After the installation, select <Restart>.
After restarting the Windows, you will find the YAMAHA folder
on your PC (Program Files as the default) and XGworksLite
folder in the YAMAHA folder.
Refer to the "XGworks Manual" (XGworks.pdf) and online man-
uals how to use the application.

■ DX200 Editor ••••••••••••••••••••••
You can use the DX200 Editor Plug-in applications of XGworks
lite to edit the Patterns of the DX200.

1 Double-click on the "Plug" folder.
   Various files like "Setup.exe" will be displayed.

2 Double-click on the "Setup.exe."
   YAMAHA DX200 Editor Setup Dialog box will be displayed.

**3 Execute the installation by following the directions appear-
   ing on the screen.**

After completing the installation procedure, you will find the
DX200 Editor Plug-in software in the "XGworksLite" folder and
find that DX200 Editor Plug-in application is added to the
[Plug-in] menu on the XGworks lite.
Refer to the online help/PDFmanuals how to use the applica-
tion.

For Macintosh Users

This CD-ROM contains the following;

The CD-ROM includes two folders: "Internatiotal" and "Japanese."

Double-click on the "International" folder to open it. You will find a variety of applications and data files packed in the following four folders.

- **Acrobat Reader 4.0**
- **Open Music System (OMS) 2.3.8**
- **DX200 Editor**
- **PLG150-DX Preset Voice Files**

  These are Preset Voice Files for the PLG150-DX. These are compatible with the DX200, so can be edited with the DX200 Editor.

  File names are "PlgDxP1.DX2" to "PlgDxP7.DX2."

Minimum System Requirement

DX200 Editor

OS:	Mac OS8.0 to 9.04
CPU:	PowerPC604, 100MHz or faster (G3, 300MHz or faster is recommended)
Available memory:	15MB or more
Free space in Hard Disk:	8MB or more (excluding the OMS)
Display:	800 x 600, 256 colors or more

Installing Softwares

■ Acrobat Reader 4.0 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●

You need to install Acrobat Reader to view the PDF manuals accompanied with each application in advance.

1 Double-click on the "Acrobat" folder.
Three different language folders will be displayed: English, German and French.

2 Select the language you want to use and double-click on its folder.
"Reader Installer" will be displayed.
The Installer name may differ depending on the language you select.

3 Double-click on the "Reader Installer."
Acrobat Reader Setup Dialog will be displayed.

4 Execute the installation by following the directions appearing on the screen.

After the installation, you will find the "Adobe Acrobat" folder on your computer (Hard Disk as the default).

Refer to the [Reader Guide] in the [Help] menu how to use the Acrobat Reader.

■ Open Music System (OMS) 2.3.8 ● ● ● ● ● ● ● ●

OMS allows you to use several MIDI applications on the Mac OS at the same time.

1 Double-click on the "OMS" folder (English version only).
"Install OMS 2.3.8" will be displayed.

2 Double-click on the "Install OMS 2.3.8." OMS Setup Dialog will be displayed.

3 Execute the installation by following the directions appearing on the screen.
After the installation, select <Restart>.
After restarting the Macintosh, you will find the "Opcode"/ "OMS Applications" folder on your computer (Hard Disk as the default).

4 Copy the "OMS_2.3_Mac.pdf" in the "OMS" folder in the CD-ROM to the "OMS Applications" folder by drag & drop operation.
Refer to the "OMS_2.3_Mac.pdf" (English version only) how to use the application.

5 Copy the "OMS Setup for YAMAHA" folder in the "OMS" folder in the CD-ROM to the hard disk on your computer by drag & drop operation. In the "OMS Setup for YAMAHA" folder you will find the OMS Setup files for the DX200 Desktop Control Synthesizer, which you can use them as the template.

■ DX200 Editor ●

DX200 Editor allows you to edit the DX200 Patterns on your computer.

1 Double-click on the "DX200 Editor" folder.
"Install DX200 Editor" will be displayed.

2 Double-click on the "Install DX200 Editor."
DX200 Installation Dialog will be displayed.

3 Execute the installation by following the directions appearing on the screen.

After the installation, you will find the "DX200 Editor for Macintosh" folder on your computer (Hard Disk as the default).If you use French or German MacOS, French or German manual are automatically installed.
Refer to the "DX200Editor.pdf" in the same folder how to use the application.

Specifications

1.FUNCTIONS

Tone Generator FM Synthesis
(6 Operator FM, Filter(FEG), Amp(AEG), PEG, Noise) + AWM2

Timber	1 (FM) + 3 (AWM2) parts
Polyphony	16 (FM) + 32 (AWM2) Notes
Effector	Distortion, 3-Band EQ (only FM) + 1 Effector (Tempo Delay/Reverb, Flanger/Chorus, Phaser, Amp.Simulator)
Pattern	Preset Pattern x 256, User Pattern x 128
Scene	2 Scene/Pattern
Step Sequencer	MIDI Sync, MIDI Transmit
Others	Free EG (4 tracks)

2.CONTROLLERS

Sound Control Knob   x 16
(Cutoff/Filter Type, Resonance, FEG Depth, Modulator Harmonic, Modulator FM Depth, Modulator Decay, Noise Level, EG Attack, EG Decay, EG Sustain, EG Release, Portamento Time, Effect Param/Pan, Effect Wet/Vol, LFO Speed, Scene Control)

Master Volume Knob   x 1

Rotary Encorder   x 1

3.PANEL SWITCHES

Sound Control Sw.   x 8
(LFO Detail, Key Assign, Algorithm, Modulator Select, Effect Type, EG Select, Dist Sw)
Scene x 2, Sequencer. Sw x 2, Mode x 2, Pattern Select x 1, Keyboard Mode x 1, Step Select x 16, Step Group Select x 2, Track Select x 2, Play Effect x 2, Octave x 2, Tap Tempo x 1, Free EG Sw. x 4, Free EG Mode x 1, Free EG Length x 1, Store x 1, Show Value x 1, Shift x 1, Exit x 1

4.DISPLAY

7SEG LED   x 4

5.CONNECTORS

OUTPUT L(MONO)/R	Phone x 2
MIDI IN/OUT	Din x 2
DC IN	
PHONES	Stereo phone

6.MAXIMUM OUTPUT LEVEL

Phones	+0.5dBm (33ohm)
Stereo Output	+9.0dBm (10kohm)

7.DIMENSIONS,WEIGHT

338.0(W) x 208.9(D) x 51.7(H) mm, 1600 g

8.ACCESSORIES

CD ROM (for Windows and Macintosh)   x 1
Owner's Manual   x 1
AC Adaptor   x 1
(Power supply recommendation may vary from country to country. Please check with your nearest Yamaha dealer for further details.)

- *Specifications and descriptions in this owner's manual are for information purposes only. Yamaha Corp. reserves the right to change or modify products or specifications at any time without prior notice. Since specifications, equipment or options may not be the same in every locale, please check with your Yamaha dealer.*
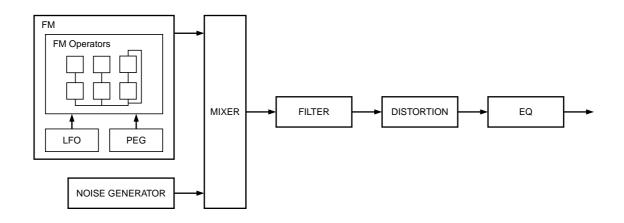
- *Die technischen Daten und Beschreibungen in dieser Bedienungsanleitung dienen nur der Information. Yamaha Corp. behält sich das Recht vor, Produkte oder deren technische Daten jederzeit ohne vorherige Ankündigung zu verändern oder zu modifizieren. Da die technischen Daten, das Gerät selbst oder Sonderzubehör nicht in jedem Land gleich sind, setzen Sie sich im Zweifel bitte mit Ihrem Yamaha-Händler in Verbindung.*

- *Les caractéristiques techniques et les descriptions du mode d'emploi ne sont données que pour information. Yamaha Corp. se réserve le droit de changer ou modifier les produits et leurs caractéristiques techniques à tout moment sans aucun avis. Du fait que les caractéristiques techniques, les équipements et les options peuvent différer d'un pays à l'autre, adressez-vous au distributeur Yamaha le plus proche.*

Error Messages

Display indication	Message	Comment
Err 1 (flashes)	Battery Low	This appears when the voltage of the internal backup battery becomes low. Have the battery replaced by your local Yamaha dealer or any Yamaha-authorized service personnel.
Err2 (flashes)	MIDI Buffer Full	This appears when too much MIDI data has been received at one time, causing the unit to stop processing data.
Err3 (flashes)	MIDI Data Error	This appears when the received MIDI data is incorrect or contains errors.
Err4 (flashes)	MIDI Checksum Error	This appears when checksum of the received System Exclusive data is incorrect.

Troubleshooting

Problem	Possible cause/Solution
No power.	Is the adaptor properly plugged into both the DX200 and the AC outlet? (Page 11)
No sound.	• Is the panel volume control set to an appropriate level? • Are other volume-related parameters set to appropriate levels? (Page 39) • Is the EG Attack Time appropriately short, for short percus-sive sounds? (Page 46) • Is the Velocity of keyboard is appropriate? (Page 21)
No sound from a particular track.	• Is the track set to a proper Volume? (Page 39) • Is the Track Mute setting appropriate? In other words, is the track unmuted? (Page 37) • Are all recorded steps on? (Step Mute, page 38) • Is Cutoff set to a proper level? (Page 27)
No sound when playing the keyboard.	Is the [KEYBOARD] button lit? If not press it to enable the keyboard. (Page 20)
No sound when playing a connected MIDI keyboard or other device.	• Have you connected the MIDI cables properly? • Are all MIDI channel settings appropriate? (Page 97)
The knobs and other Voice controls have no effect on the sound.	• Is the Synth track selected? (If one of the Rhythm tracks is selected, some knobs may affect the Rhythm sound instead.) • Is the Step Edit mode active? In other words, are either of the buttons [STEP 1-8] or [STEP 9-16] on? (If so, turning some of the knobs may unexpectedly change some of the recorded steps.) (Page 73)
The Sequence doesn't play back.	• Is Show Value active? (Page 31) Is Original Value active? (Page 32) Make sure these are off. • Have you selected any of these modes — Pattern Job, MIDI Setup, or Utility? • When syncing to another MIDI device, have you made sure that the MIDI connections and relevant settings are correct? (Page 96) • Is the MIDI clock set to "Internal"? (Page 97)
Recording (either Sequence or Free EG) doesn't work.	Is the Pattern mode active? Press [PATTERN] to make sure you're in Pattern mode.
Free EG tracks can't be recorded.	Are any of the Free EG tracks selected (on)? (Page 60)
Turning Free EG tracks on or off has no effect.	Is the Synth track selected?
The length of the notes of the Sequence sounds wrong.	Has the playback Gate Time been set to a value other than "100"? (Page 35)
The pitch of the Sequence sounds wrong.	Has the Transpose Pattern setting been changed? Call up this function to check the value, and change it if necessary. (Page 66)
When playing by the external sequencer, the Step Sequencer of the DX200 starts.	Is the MIDI control set to "Out" or "Off"? (Page 107)
When playing the DX200 by the DX200 Editor, the Step Sequencer of the DX200 does not play correctly even if pressing the [PLAY] button.	• Is the MIDI control set to "On" or "In"? (Page 107) • Is the MIDI clock set to "Internal"? (Page 97)
The bulk data cannot be received by the DX200 Editor.	Are the MIDI IN/OUT jacks of the DX200 and the MIDI OUT/IN jacks of the computer (or MIDI interface) are properly connected? (Page 106)

FM Tone Generation
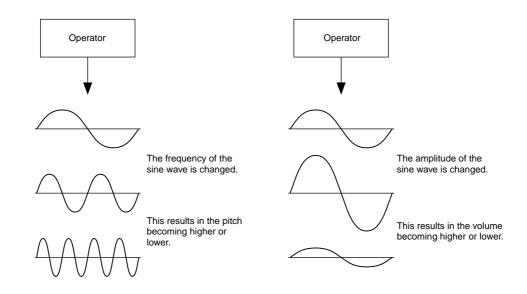
Before actually editing the DX200 voices, let's get an idea of how the FM tone generator works.

Operators

In the DX200, there are six special devices called "operators" that generate sine waves. A sine wave is the fundamental wave of a note, with absolutely no overtones or harmonics added. These six operators are combined in various ways to make up the different voices produced by the DX200. The operators can be used to freely change two different aspects of the sound:

(1) The frequency (pitch) of the generated sine wave.
(2) The amplitude (volume or output level) of the generated sine wave.

The frequency of the sine wave is changed.

This results in the pitch becoming higher or lower.

The amplitude of the sine wave is changed.

This results in the volume becoming higher or lower.
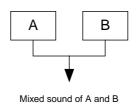
Combinations of Two Operators

Although the six operators can be combined in a wide variety of ways for many different sounds, here we'll look at the fundamental combinations of just two operators, to help you understand the basics of FM synthesis.

Two sine wave operators (labelled "A" and "B" here) can be combined in one of two ways: horizontally or vertically.
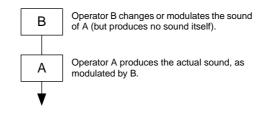
(1) Horizontal Combination
When the two operators are combined horizontally, the sounds of the two are simply mixed together. This combining of two or more different sounds is called additive synthesis.

```
A        B
```

Mixed sound of A and B

(2) Vertical Combination
When the two operators are combined vertically, the sound of the top operator (B) "modulates" that of the lower operator (A). In this situation, operator B produces no sound, but alters the sound of operator A, producing a sound of greater harmonic complexity. This "stacking" of operators is called Frequency Modulation (FM) synthesis.

```
B     Operator B changes or modulates the sound
      of A (but produces no sound itself).

A     Operator A produces the actual sound, as
      modulated by B.
```
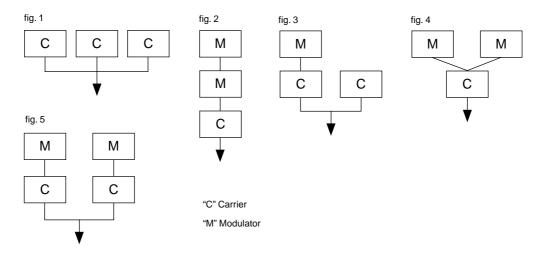
To sum it up, when two operators are combined horizontally, both operators generate the sound; when combined vertically, one operator changes the sound, the other produces it.

Carrier and Modulator

In FM tone generation, each of the six operators functions as either a carrier or a modulator. The operator doing the modulation is called the modulator; the one being modulated and delivering the actual sound is called the carrier. Referring back to "Vertical Combination" on the previous page, operator A is the carrier and operator B is the modulator.

Let's take a look at some more complex configurations, in which three or more operators are used. Keep in mind that the modulator/carrier function is the same in all examples.

fig. 1

| C | C | C |

fig. 2

M
M
C

fig. 3

M
C   C

fig. 4

M   M
C

fig. 5

M   M
C   C

"C" Carrier

"M" Modulator

- In fig. 1, all operators are combined horizontally and there are no modulators, only carriers. Without modulation, all carriers output simple sine waves.

- In fig. 2, three operators are stacked vertically, and only the lowest is a carrier. The top operator modulates the middle one, which in turn modulates the carrier at the bottom. This results in a complex waveform, with many harmonics or overtones. (An explanation of harmonics follows on the next page.)

- In fig. 3, there are two carriers and one modulator. The sole carrier on the right produces a simple sine wave, while the modulator/carrier pair on the left produce a more complex waveform with added harmonics. The actual sound is a mix of the two carriers.

- In fig. 4, two modulators are used change the sound of a single carrier. Using two modulators produces an even more complex sound than is possible with one, with a greater amount of harmonics.

- In fig. 5, there are two modulator/carrier pairs, each generating a complex sound with many harmonics. As with the operators in fig. 3, the actual sound is a mix of the two carriers.
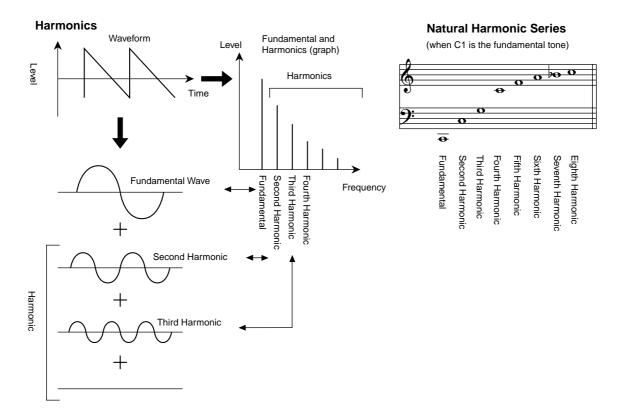
Harmonics

Most sounds are made up of multiple tones that are different than the pitch (frequency). Within these multiple tones, the one that determines the pitch of the entire sound is called the fundamental tone (fundamental frequency). All the tones besides the fundamental tone are called harmonics or overtones.

When all the harmonics that are related to a particular fundamental tone are arranged in order, it is called a harmonic series. Each tone in the harmonic series is given a name in order, with the fundamental tone being one, followed by the second harmonic, third harmonic and so on.
The frequency of each harmonic in the harmonic series is a natural number multiple of the frequency of the fundamental tone. Overtones that have frequencies that are not natural number multiples of the fundamental are called unharmonic overtones.

Generally, the more harmonics the tone has, the brighter the sound. On the other hand, if the amount of harmonics is reduced, the tone will sound darker. Furthermore, the voice will change a lot according to the type and volume of the harmonics. For example, if there are a lot of high pitched harmonics in the tone, it will have a brilliant, crisp sound. On the other hand, a tone with a large amount of lower harmonics will have a rather "fat," warm sound.

Harmonics

Natural Harmonic Series
(when C1 is the fundamental tone)
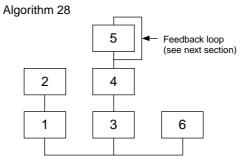
Algorithms

Although two operators can be combined in only two different ways, six operators can be configured in a wide variety of combinations. These combinations are called "algorithms." Just as on the original DX7, the DX200 features 32 different algorithms, giving you different levels of harmonic complexity for various applications.

Since the function of any given operator depends on the particular algorithm, you should check a voice's algorithm carefully while editing the voice. For a chart showing all 32 algorithms, see page 123. Each operator in the algorithm is numbered to distinguish it from the others in editing.

Let's take a look at algorithm 28 as an example. The various operators function as follows:
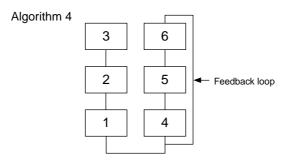
Operator 1...........**Carrier; is modulated by Operator 2, and outputs the resulting sound.**
Operator 2...........**Modulator; modulates Operator 1.**
Operator 3...........**Carrier; is modulated by Operator 4, and outputs the resulting sound.**
Operator 4...........**Modulator; modulates Operator 3.**
Operator 5...........**Modulator; modulates itself with a feedback loop, and modulates Operator 4.**
Operator 6...........**Carrier; outputs a sine wave.**

Algorithm 28

Feedback

Each algorithm has a special feedback loop, programmed to a fixed location in the algorithm. With feedback, a modulator's output is connected to its own input, so that it modulates itself. This can be used to increase the harmonic content of the sound, making it more rich and complex. When set to a high level, feedback can generate noise effects - making it useful for percussive voices, metallic sounds, and distortion effects.

Some algorithms feature a feedback loop that takes in two or three operators as a group. One such example is algorithm 4 shown below, in which the output of operator 4 is returned to the input of operator 6, thus modulating the entire stack. This provides even greater possibilities for tonal variation and richness.

Algorithm 4
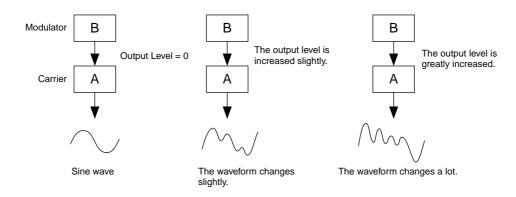
Voice Editing Essentials

There are four main elements that determine the character of a voice:

    (1) Each operator's output level.
    (2) Each operator's frequency.
    (3) The feedback level.
    (4) Each operator's envelope generator (EG).

(1) Operator Output Level

The output levels of the operators are the most important parameters in editing a voice. Among these, the output level of the modulator(s) has the greatest effect on the timbre or tonal quality of the voice. If a modulator's output level is set to "0" so that it does not modulate the carrier, the resulting output of the carrier will be a simple sine wave (below). Increasing the output of the modulator increases the degree of modulation and, hence, the amount of harmonics in the sound. Generally, the greater the modulator's output, the brighter the sound will be. Extremely high values result in a harsh, noisy sound.

Modulator: B

Output Level = 0 — Carrier A — Sine wave

The output level is increased slightly. — The waveform changes slightly.

The output level is greatly increased. — The waveform changes a lot.
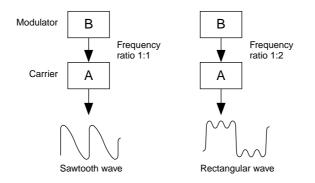
Since the carrier actually produces the sound, increasing the output level of a carrier increases the volume of the sound. If there are two or more carriers, changing the output level of individual carriers may also affect the timbre of the sound, since the volume balance of the different carriers is changed.

(2) Operator Output Frequency

The type of harmonics added to the carrier output by means of the modulator is determined by the ratio between the frequencies of the modulator and carrier. For example, when two operators are combined vertically, and "F COARSE" for both of them is set to 1.00, the frequency ratio will be 1:1 and the first, second, third and following whole number series harmonics will be generated in order. This type of harmonic configuration is called a sawtooth wave, and is used for making voices like brass, strings, or piano.

If the "F COARSE" for the modulation in this situation is changed to 2.00, the frequency ratio becomes 1:2, and the odd numbered harmonics, the first, third and fifth and following harmonics will be generated. This harmonic configuration is called a rectangular wave, and is used for creating woodwind voices for like clarinet and oboe.
Furthermore, if "F FINE" is set so that the frequency ratio is not a whole number, many non-integer overtones will be produced. The sound can be used for creating metallic sounds, the noise when strings are hit with something, or breath noise.

Modulator — B | B

Frequency ratio 1:1 | Frequency ratio 1:2

Carrier — A | A

Sawtooth wave | Rectangular wave

(3) Feedback Level

As we saw earlier, feedback is a function in which a modulator's output is connected to its own input, so that it modulates itself. Increasing the feedback level increases the harmonic content of the sound, making it brighter and complex. Keep in mind that the total effect also depends on the output level of the feedback-applied operator; if that operator's output level is set to "0," feedback level will have no affect on the sound.
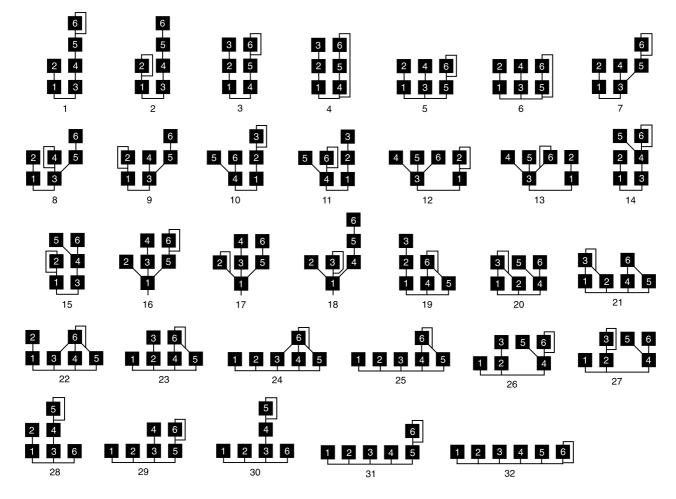
(4) EG (Envelope Generator)

The EG (Envelope Generator) parameters allow you to shape the sound of the voice. In other words, these determine how the level of the voice changes over time, from when a key on the keyboard is played until it is released and the sound dies out.

The EG parameters let you reproduce the sound of acoustic instruments, and their natural patterns of attack, sustain and decay. For example, the sound of a piano has a very sharp attack and a moderately long sustain: The sound gets loud the instant a key is played, and gradually fades away as the key is held. The tone or timbre of the sound also changes in time, with the sound starting out very bright and gradually growing warmer and softer (as the harmonics start to fade).

Since each operator has its own EG, the DX200 gives you comprehensive and dynamic control over both the volume and timbre of the voice, letting you accurately reproduce these natural acoustic effects. The carrier EGs affect the volume of the sound over time, while the modulator EGs affect the timbre.

Chart of Algorithms

(Algorithm diagrams 1–32)

Modulator groups

Modulator Select = 1

Algorithm	Operator No.					
	1	2	3	4	5	6
1		o		o		
2		o		o		
3		o		o		
4		o		o		
5		o				
6		o				
7		o		o		
8		o		o		
9		o		o		
10					o	o
11					o	o
12					o	o
13		o				
14		o				
15		o		o		
16		o				
17		o				
18		o				
19		o				
20				o		
21						o
22		o				
23	o					
24	o					
25	o					
26			o			
27			o			
28		o				
29	o	o				
30		o				
31			o			
32	o					

Modulator Select = 2

Algorithm	Operator No.					
	1	2	3	4	5	6
1					o	
2					o	
3			o			
4			o			
5				o		
6				o		
7					o	
8					o	
9					o	
10		o				
11		o				
12		o				
13				o	o	
14					o	
15					o	
16			o			
17			o			
18				o		
19			o			
20						o
21					o	
22					o	
23			o			
24		o				
25		o				
26					o	
27					o	
28				o		
29				o		
30				o		
31					o	
32			o			

Modulator Select = 3

Algorithm	Operator No.					
	1	2	3	4	5	6
1						o
2						o
3						o
4						o
5						o
6						o
7						o
8						o
9						o
10			o			
11			o			
12				o		
13						o
14						o
15				o		o
16					o	o
17					o	
18			o			
19						o
20		o				
21		o				
22						o
23						o
24						o
25						o
26						o
27						o
28					o	
29						o
30				o		
31						o
32						o

o : controlled operator (When the Modulator Select (Tip 42) is set to "ALL," all operators of 1 to 3 are controlled.)

MIDI Data Format

1. Channel messages

1.1 Note on/note off
These messages convey keyboard performance data.

Range of note numbers transmitted and received = C-2...G8
Velocity range = 1...127 (Velocity is received only for note-on)

1.2 Control changes
These messages convey control operation information for volume or pan etc.
Their functions are differentiated by the control number (Ctrl#).

1.2.1 Bank Select
This message selects the voice bank.

Control#	Parameter	Data Range
0	Bank Select MSB	0...127
32	Bank Select LSB	0...127

The Bank Select data will be processed only after a Program Change is received, and then voice bank will change at that time. If you wish to change the voice bank as well as the voice, you must transmit Bank Select and Program Change messages as a set, in the following order: Bank Select MSB, LSB, and Program Change.

1.2.2 Modulation
This message controls the depth of modulation.

Control#	Parameter	Data Range
1	Modulation	0...127

1.2.3 Portamento Time
This message controls the degree of Portamento (see 1.2.9).

Control#	Parameter	Data Range
5	Portamento Time	0...127

A value of 0 is no effect, and 127 is the longest Portamento time. No effect in Rhythm tracks.

1.2.4 Data Entry
This message sets the value of the parameter which was specified by RPN (see 1.2.17) and NRPN (see 1.2.16) (Rhythm Track only).

Control#	Parameter	Data Range
6	Data Entry MSB	0...127
38	Data Entry LSB	0...127

1.2.5 Main Volume
This message controls the volume of each part. (It is used to adjust the volume balance between parts.)

Control#	Parameter	Data Range
7	Main Volume	0...127

With a value of 0 there will be no sound, and a value of 127 will produce the maximum volume.

1.2.6 Panpot
This message controls the panning (stereo location) of each part.

Control#	Parameter	Data Range
10	Pan	0...64...127

0 is left, 64 is center, and 127 is right.

1.2.7 Expression
This message controls expression for each part. (It is used to create volume changes during a song.)

Control#	Parameter	Data Range
1l	Expression	0...127

1.2.8 Hold1
This message controls sustain pedal on/off.

Control#	Parameter	Data Range
64	Hold1	0...63, 64...127 (OFF, ON)

When this is ON, currently-sounding notes will continue to sound even if note-off messages are received.

1.2.9 Portamento
This message controls Portamento pedal on/off.

Control#	Parameter	Data Range
65	Portamento	0...63, 64...127 (OFF, ON)

When ON, Portamento produces a smooth glide connecting two notes of different pitch. The time over which the pitch changes is adjusted by Portamento Time (see 1.2.3). No effect in Rhythm tracks.

1.2.10 Sostenuto
This message controls sostenuto pedal on/off.

Control#	Parameter	Data Range
66	Sostenuto	0...63,64...127 (OFF , ON)

If sostenuto is turned on while a note is sounding, that note will be sustained until sostenuto is turned OFF.
No effect in Rhythm tracks.

1.2.11 Release Time
This message adjusts the EG release time that was specified by the sound data.

Control#	Parameter	Data Range	
72	Release Time	0...127	Synth Track only
		0...64...127	Rhythm Track only
		(-64...0...+63)	

Since this is a relative change parameter in Rhythm track, it specifies an increase or decrease relative to 64. Increasing this value will lengthen the release time that follows a note-off.

1.2.12 Attack Time
This message adjusts the EG attack time that was specified by the sound data.

Control#	Parameter	Data Range	
73	Attack Time	0...127	Synth Track only
		0...64...127	Rhythm Track only
		(-64...0...+63)	

Since this is a relative change parameter in Rhythm track, it specifies an increase or decrease relative to 64. Increasing this value will make the attack more gradual, and decreasing this value will make the attack sharper.

1.2.13 Brightness
This message adjusts the cutoff frequency of the low pass filter specified by the sound data.

Control#	Parameter	Data Range	
74	Brightness	0...127	Synth Track only
		0...64...127	Rhythm Track only
		(-64...0...+63)	

Since this is a relative change parameter in Rhythm track, it specifies an increase or decrease relative to 64. Lower values will produce a more mellow sound.
For some sounds, the effective range may be less than the possible range of settings.

1.2.14 Decay Time
This message adjusts the EG decay time that was specified by sound data.

Control#	Parameter	Data Range	
75	Decay Time	0...127	Synth Track only

It determines how long it takes for the sound changes from maximum level to sustain level.

1.2.15 Effect4 Depth
This message adjusts the Send level to Effect.

Control#	Parameter	Data Range
94	Effect4 Depth	0...127

Increasing this value will more effective.

1.2.16 NRPN (Non-registered parameter number)
Use NRPN MSB and NRPN LSB to specify the parameter that you wish to modify, and then use Data Entry (see 1.2.4) to set the value for the specified parameter. (Rhythm Track only).

NRPN MSB LSB	Data Entry*1 MSB LSB	Parameter Name and Data Range
18H rrH	mm --	Drum Instrument Pitch Coarse rr : drum instrument note number mm : 00H - 40H - 7FH (-64...0...+63)

*1 See 1.2.4

1.2.17 RPN (Registered parameter number)
Use RPN MSB and RPN LSB to specify the parameter that you wish to modify.

RPN MSB LSB	Data Entry *1 MSB LSB	Parameter Name and Value Range
7FH 7FH	-- --	RPN Null This empties settings from RPN and NRPN numbers. Internal data is not affected.

*1 See 1.2.4

1.2.18 Others
If the Control Change IN/OUT = ALL, all following Control Change Number are transmitted and received.
If the Control Change IN/OUT = NORM, the following Control Change Number in ▒▒▒ are transmitted and received.

category	param	CC#	
		SYNTH	RHYTHM
SCENE	scene	3	-
LFO	wave	15	-
	pmd	18	-
	fmd	19	-
	amd	80	-
	speed	16	-
AEG	attack	73	-
	decay	75	-
	sustain	31	-
	release	72	-
FEG	attack	82	-
	decay	83	-
	sustain	28	-
	release	29	-
COMMON	key assign	8	-
		9	-
	portamento	5	-
ALGORITHM	type	33	-
MODULATOR	select	-	-
NOISE OSC	type	51	-

category	param		CC#	
			SYNTH	RHYTHM
MISC	harmonic			
		mod1	20	-
		mod2	21	-
		mod3	22	-
	FM depth			
		mod1	23	-
		mod2	24	-
		mod3	25	-
	FM decay			
		mod1	26	-
		mod2	27	-
		mod3	30	-
	noise level		39	-
EFFECT	type		88	-
			89	-
	param		48	-
	wet (send)		94	94
DISTORTION	switch		49	-
VCF	cutoff		74	
				74
	filter type		59	-
	resonance		71	
				71
	FEG depth		81	-
MIXER	pan		10	10
	volume		7	7

1.3 Channel mode messages

These messages specify the basic operation of a part.

1.3.1 All Sound Off

This message silences all notes being played on the corresponding channel.
However, channel messages such as Note-on and Hold-on will be maintained in their present state.

Control#	Parameter	Data Range
120	All Sound Off	0

1.3.2 Reset All Controllers

This message changes the settings of the following controllers.

Controller	Value
Pitch bend change	±0 (Center)
Channel pressure	0 (OFF)
Modulation	0 (OFF)
Expression	127 (Max.)
Hold	0 (OFF)
Portamento	0 (OFF)

The following data is not changed
Parameter values specified for program change, bank select MSB/LSB, volume, pan, effect send level 4.

Control#	Parameter	Data Range
121	Reset All Controllers	0

1.3.3 All Note Off

This message turns off all notes which are currently on for the corresponding part.
However, if Hold 1 or Sostenuto are on, notes will continue to sound until these are turned off.

Control#	Parameter	Data Range
123	All Note Off	0

1.3.4 Omni Off

Works the same as when All Note Off is received.

Control#	Parameter	Data Range
124	Omni Off	0

1.3.5 Omni On

Works the same as when All Note Off is received.

Control#	Parameter	Data Range
125	Omni On	0

1.3.6 Mono

Works the same as when All Sound Off is received, and if the value (mono number) is in the range of 0... 16, sets the corresponding channel to Mode4* (m = 1).

Control#	Parameter	Data Range
126	Mono	0 ... 16

* Mode4 is a state in which only channel messages on the specified channel will be received, and notes will be played individually (monophonically).

1.3.7 Poly

Works the same as when All Sound Off is received, and sets the corresponding channel to Mode3*.

Control#	Parameter	Data Range
127	Poly	0

* Mode3 is when channel messages will be received only on the specified channel, and notes will be sounded polyphonically.

1.4 Program change

This message is used to switch voices.
It changes the program number on the receiving channel. When the change is to include the voice bank, transmit the program change after sending the Bank Select message (see 1.2.1).

1.5 Pitch bend

This message conveys information on pitch bend operations.

2. System exclusive messages

2.1 Parameter changes

This device uses the following parameter changes.
[UNIVERSAL REALTIME MESSAGE]
  1) Master Volume

[UNIVERSAL NON REALTIME MESSAGE]
  1) Identity Request (INQUIRY MESSAGE)
  2) Identity Reply (INQUIRY MESSAGE)

[DX200 NATIVE PARAMETER CHANGE]
  1) System1 parameter change
  2) System2 parameter change
  3) Current Voice Common1 parameter change
  4) Current Voice Common2 parameter change
  5) Current Voice FreeEG parameter change
  6) Currnet Voice Step Seq. parameter change
  7) Currnet Rhythm Step Seq. parameter change
  8) Current Effect parameter change
  9) Current Mulit Part parameter change

[DX PARAMETER CHANGE]
  1) VCED parameter change
  2) ACED parameter change

2.1.1 Universal realtime messages

2.1.1.1 Master Volume

11110000	F0H	= Exclusive status
01111111	7FH	= Universal Real Time
01111111	7FH	= ID of target device
00000100	04H	= Sub-ID #1=Device Control Message
00000001	01H	= Sub-ID #2=Master Volume
* 0sssssss	SSH	= Volume LSB
0ttttttt	TTH	= Volume MSB
11110111	F7H	= End of Exclusive

or

11110000	F0H	= Exclusive status
01111111	7FH	= Universal Real Time
0xxxnnnn	XNH	= Device Number, xxx = don't care
00000100	04H	= Sub-ID #1=Device Control Message
00000001	01H	= Sub-ID #2=Master Volume
0sssssss	SSH	= Volume LSB
0ttttttt	TTH	= Volume MSB
11110111	F7H	= End of Exclusive

When received, the Volume MSB is reflected in the System Parameter MASTER VOLUME.

* The binary expression 0sssssss is expressed in hexadecimal as SSH.
The same applies elsewhere.

2.1.2 Universal non-realtime messages

2.1.2.1 Identity Request

11110000	F0H	= Exclusive status
01111110	7EH	= Universal Non-Real Time
0xxxnnnn	XNH	= ID of target device
00000110	06H	= Sub-ID #1=General Information
00000001	01H	= Sub-ID #2=Identity Request
11110111	F7H	= End of Exclusive

When this message is received, the Identity Reply Message (2.1.2.2, below) is transmitted.

2.1.2.2 Identity Reply

11110000	F0H	= Exclusive status
01111110	7EH	= Universal Non-Real Time
0xxxnnnn	XNH	= ID of target device
00000110	06H	= Sub-ID #1=General Information
00000010	02H	= Sub-ID #2=Identity Reply
01000011	43H	= YAMAHA ID
00000000	00H	= Device Family Code LSB DX200 ID #1
01000001	41H	= Device Family Code MSB DX200 ID #2
00000011	03H	= Device Number Code LSB DX200 ID #3
00000101	05H	= Device Number Code MSB DX200 ID #4
00000000	00H	
00000000	00H	
00000000	00H	
00000001	01H	
11110111	F7H	= End of Exclusive

When the Identity Request message (2.1.2.1, above) is received, this message is transmitted.

2.1.3 DX200 Native parameter change

This message sets parameters unique to the DX200.
Each message can set a single parameter. The message format is as follows.

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0001nnnn	1NH	N:Device Number
01100010	62H	Model ID
0ggggggg	GGH	Address High
0mmmmmmm	MMH	Address Mid

```
01111111   LLH        Address Low
0vvvvvvv   VVH        Data
    :        :
11110111   F7H        End of Exclusive
```

For parameters whose Data Size is 2 or 4, the appropriate amount of data will be transmitted as indicated by Size.

```
11110000   F0H        Exclusive status
01000011   43H        YAMAHA ID
0001nnnn   1NH        N:Device Number
01101101   6DH        Model ID
0ggggggg   GGH        Address High
0mmmmmmm   MMH        Address Mid
01111111   LLH        Address Low
0vvvvvvv   VVH        Data
    :        :
11110111   F7H        End of Exclusive
```

For parameters whose Data Size is 2 or 4, the appropriate amount of data will be transmitted as indicated by Size.

2.1.3.1 System1 parameter change

This message sets the System1 block of the voice is sounding currently (see Tables <4-1> and <4-2>).

2.1.3.2 System2 parameter change

This message sets the System2 block of the voice is sounding currently (see Tables <1-1> and <1-2>).

2.1.3.3 Current Vocie Common1 parameter change

This message sets the Common1 block of the voice is sounding currently (see Tables <1-1> and <1-3>).

2.1.3.4 Current Vocie Common2 parameter change

This message sets the Common2 block of the voice is sounding currently (see Tables <1-1> and <1-4>).

2.1.3.5 Current Vocie FreeEG parameter change

This message sets the Free EG block of the voice is sounding currently (see Tables <1-1> and <1-7>).

2.1.3.6 Current Voice Step Seq parameter change

This message sets the Step Seq block of the voice(SYNTH Track) is sounding currently (see Tables <1-1> and <1-8>).

2.1.3.7 Currnet Rhythm Step Seq parameter change

This message sets the Step Seq block of the Rhythm Track (see Tables <4-1> and <4-10>).

2.1.3.8 Current Effect parameter change

This message sets the Effect block (see Tables <4-1> and <4-3>).

2.1.3.9 Current Mulit Part parameter change

This message sets the Multi Part block (see Tables <4-1> and <4-8>).

2.1.4 DX Parameter Change

```
11110000   F0H        Exclusive status
01000011   43H        YAMAHA ID
0001nnnn   1NH        N:Device Number
0ggggghh   GGH        Parameter Group No.
0ppppppp   PPH        Parameter No.
0vvvvvvv   VVH        Data
11110111   F7H        End of Exclusive
```

2.1.4.1 VCED parameter change

This message sets the VCED block (see Table <2-1> and <2-2>).

2.1.4.2 ACED parameter change

This message sets the ACED block (see Table <2-1> and <2-3>).

2.2 Bulk dump

This device uses only the following bulk dump receiving messages.

[DX200 NATIVE BULK DUMP]
1) System1 bulk dump
2) System2 bulk dump
3) Current Voice Common1 bulk dump
4) Current Voice Common2 bulk dump
5) Current Voice FreeEG bulk dump
6) Current Voice Scene1 bulk dump
7) Current Voice Scene2 bulk dump
8) Currnet Voice Step Seq. bulk dump
9) Currnet Rhythm Step Seq. bulk dump
10) Current Effect bulk dump
11) Current Mulit Part bulk dump
12) User Pattern Voice Common1 1...128
13) User Pattern Voice Common2 1...128
14) User Pattern Voice Scene1 1...128
15) User Pattern Voice Scene2 1...128
16) User Pattern Voice FreeEG 1...128
17) User Pattern Voice Step Seq. 1...128
18) User Pattern Effect 1 ... 128
19) User Pattern Multi Part 1 ... 128
20) User Pattern Rhythm Step Seq 1 ... 128
21) User Song 1 ... 10

[DX BULK DUMP]
1) VCED
2) ACED
3) VMEM
4) AMEM

2.2.1 DX200 Native Bulk Dump

This message sets the special parameters for DX200.
Unlike Parameter change, one message can modify multiple parameters.

```
11110000   F0H        Exclusive status
01000011   43H        YAMAHA ID
0000nnnn   0NH        N:Device Number
01100010   62H        Model ID
0sssssss   SSH        ByteCountMSB
0ttttttt   TTH        ByteCountLSB
0ggggggg   GGH        Address High
0mmmmmmm   MMH        Address Mid
01111111   LLH        Address Low
0vvvvvvv   VVH        Data
    :        :
0kkkkkkk   KKH        Check-sum
11110111   F7H        End of Exclusive
```

Address and Byte Count are given in tables <1-n>.
Byte Count is indicated by the total size of the Data in tables <1-n>.
Bulk dump is received when the beginning of the block is specified in "Address."
"Block" indicates the unit of the data string that is indicated in tables <1-n> as "Total Size."
Check sum is the value that produces a lower 7 bits of 0 when ths Start Address, Byte Count, Data, and the Check sum itself are added.

2.2.1.1 System1 bulk dump

This message sets the System1 block (see Tables <4-1> and <4-2>).

2.2.1.2 System2 bulk dump

This message sets the System2 block (see Tables <1-1> and <1-2>).

2.2.1.3 Current Voice Common1 bulk dump

This message sets the Common1 block of the voice is sounding currently (see Tables <1-1> and <1-3>).

2.2.1.4 Current Voice Common2 bulk dump

This message sets the Common2 block of the voice is sounding currently (see Tables <1-1> and <1-4>).

2.2.1.5 Current Voice FreeEG bulk dump

This message sets the Free EG block of the voice is sounding currently (see Tables <1-1> and <1-7>).

2.2.1.6 Current Scene1 bulk dump

This message sets the Scene1 block of the voice is sounding currently (see Tables <1-1> and <1-5>).

2.2.1.7 Current Scene2 bulk dump

This message sets the Scene2 block of the voice is sounding currently (see Tables <1-1> and <1-6>).

2.2.1.8 Current Voice Step Seq bulk dump

This message sets the Step Seq block of the voice(SYNTH Track) is sounding currently (see Tables <1-1> and <1-8>).

2.2.1.9 Current Rhythm Step Seq bulk dump

This message sets the Step Seq block of the Rhythm Track is sounding currently (see Tables <4-1> and <4-10>).

2.2.1.10 Current Effect bulk dump

This message sets the Effect block (see Tables <4-1> and <4-3>).

2.2.1.11 Current Multi Part bulk dump

This message sets the Multi Part block (see Tables <4-1> and <4-8>).

2.2.1.12 User Pattern Voice Common1 bulk dump

This message sets the User Pattern Voice Common1 block (see Tables <1-1> and <1-9>).

2.2.1.13 User Pattern Voice Common2 bulk dump

This message sets the User Pattern Voice Common2 block (see Tables <1-1> and <1-10>).

2.2.1.14 User Pattern Voice Scene1 bulk dump

This message sets the User Pattern Voice Scene1 block (see Tables <1-1> and <1-11>).

2.2.1.15 User Pattern Voice Scene2 bulk dump

This message sets the User Pattern Voice Scene2 block (see Tables <1-1> and <1-12>).

2.2.1.16 User Pattern Voice FreeEG bulk dump

This message sets the Free EG block of the voice is sounding currently (see Tables <1-1> and <1-13>).

2.2.1.17 User Pattern Voice Step Seq. bulk dump

This message sets the User Pattern Voice Step Seq. block of the voice is sounding currently (see Tables <1-1> and <1-14>).

2.2.1.18 User Pattern Effect bulk dump

This message sets the User Pattern Voice Effect block (see Tables <4-1> and <4-7>).

2.2.1.19 User Pattern Multi Part bulk dump

This message sets the User Pattern Voice Multi Part block (see Tables <4-1> and <4-9>).

2.2.1.20 User Pattern Rhythm Step Seq bulk dump

This message sets the User Pattern Rhythm Step Seq block (see Tables <4-1> and <4-11>).

2.2.1.21 User Song bulk dump

This message sets the User Song block (see Tables <4-1>, <4-12> and <4-13>).

2.2.2 DX bulk dump

```
11110000    F0H        Exclusive status
01000011    43H        YAMAHA ID
0000nnnn    0NH        N:Device Number
0ttttttt    TTH        Format No.
0sssssss    SSH        ByteCountMSB
0ttttttt    TTH        ByteCountLSB
0vvvvvvv    VVH        Data
   :         :
0kkkkkkk    KKH        Check-sum
11110111    F7H        End of Exclusive
```

Address and Byte Count are given in tables <3-n>. Byte Count is indicated by the total size of the Data in tables <4-n>.
Bulk dump is received when the beginning of the block is specified in "Address."
"Block" indicates the unit of the data string that is indicated in tables<3-n> as "Total size."
Check sum is the value that produces a lower 7 bits of 0 when the DATA, and the Check-sum itself are added.

2.2.2.1 VCED bulk dump

This message sets the VCED block (see Table <2-1> and <2-2>).

2.2.2.2 ACED bulk dump

This message sets the ACED block (see Table <2-1> and <2-3>).

2.2.2.3 VMEM bulk dump

This message sets the VMEM block (see Table <3-1> and <3-2>).

2.2.2.4 AMEM bulk dump

This message sets the AMEM block (see Table <3-1> and <3-3>).

3. Realtime Messages

3.1 Active Sensing

```
11111110    FEH
```

This is transmitted by 200msec.
After FE is received one time, if the MIDI signal does not come within 400 msec, DX200 will act the same as when ALL SOUND OFF, ALL NOTE OFF, and RESET ALL CONTROLLERS are received, and return to the condition where has not been received once.

3.2 Timing Clock

```
11111000    F8H
```

ON/OFF of the transmitting and receiving can be set.

3.3 Start

```
11111010    FAH
```

ON/OFF of the transmitting and receiving can be set.

3.4 Continue

```
11111011    FBH
```

ON/OFF of the transmitting and receiving can be set.

3.5 Stop

```
11111100    FCH
```

ON/OFF of the transmitting and receiving can be set.

4. System Common Messages

4.1 Song Position Pointer

```
11110010    F2H
0vvvvvvv    SONG POSITION LSB
0vvvvvvv    SONG POSITION MSB
```

ON/OFF of the transmitting and receiving can be set.

<1-1>
Parameter Base Address
MODEL ID = 62

Parameter	Address			Description	
	(H)	(M)	(L)		
System	00	00	00	System2	
Current Voice	10	00	00	Current Voice Common 1	(*1)
	10	01	00	Current Voice Common 2	
	10	02	00	Current Voice FreeEG	
	10	03	00	Current Voice Scene 1	
	10	04	00	Current Voice Scene 2	
	10	40	00	Current Voice Step Seq Pattern	
User Voice (Common1)	20	00	00	User Pattern Voice (Common1) 1	
	:	:	:	:	
	20	7F	00	User Pattern Voice (Common1) 128	
User Voice (Common2)	21	00	00	User Pattern Voice (Common2) 1	
	:	:	:	:	
	21	7F	00	User Pattern Voice (Common2) 128	
User Voice (FreeEG)	30	00	00	User Pattern Voice (FreeEG) 1	
	:	10	00	User Pattern Voice (FreeEG) 2	
	:	20	00	User Pattern Voice (FreeEG) 3	
	:	:	:	:	
	31	00	00	User Pattern Voice (FreeEG) 9	
	:	:	:	:	
	3F	70	00	User Pattern Voice (FreeEG) 128	
User Voice (Scene-1)	40	00	00	User Pattern Voice Scene-1 1	
	:	:	:	:	
		7F	00	User Pattern Voice Scene-1 128	
User Voice (Scene-2)	41	00	00	User Pattern Voice Scene-2 1	
	:	:	:	:	
		7F	00	User Pattern Voice Scene-2 128	
User Voice (Step Seq)	50	00	00	User Pattern Voice Step Seq 1	
	:	:	:	:	
		7F	00	User Pattern Voice Step Seq 128	

(*1) The order of transmitting Current Voice Bulk

```
       Current Voice Scene 1
       Current Voice Scene 2
              ↓
       Current Voice Common 2
              ↓
       Current Voice Common 1
```

The others can be transmitted in free order.

<1-2>

MIDI Parameter Change table (SYSTEM2)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default (H)
00 00 07	1		NOT USED		--
08	1	00 - 06	VELOCITY CURVE	DX,normal,Soft1,Soft2,Easy,Wide,Hard,	01
09	1		NOT USED		--
0A	1		NOT USED		--
0B	1		NOT USED		--
0C	1		NOT USED		--
0D	1		NOT USED		--
0E	1	00 - 03	32 BULK RECEIVE BLOCK	1-32, 33-64, 65-96, 97-127	00
0F	1		NOT USED		--

TOTAL SIZE   09

<1-3>

MIDI Parameter Change table (Current Voice Common 1)

Address High Mid Low (H)	Size (H)	Data (H)	Parameter	Description		Default (H)
10 00 00	1	00 - 01	Distortion : Off/On	0(Off), 1(On)		01(On)
01	1	00 - 64	Distortion : Drive	0...100		40(100)
02	1	00 - 03	Distortion : AMP Type	off, stack, combo, tube		01(stack)
03	1	22 - 3C	Distortion : LPF Cutoff	1.0k~Thru		30(5.0kHz)
04	1	00 - 64	Distortion : Out Level	0~100		3C(60)
05	1	01 - 7F	Distortion : Dry/Wet	D63>W(1)...D=W(40)...D<W63(7F)		01(D63>W)
06	1	04 - 28	2-Band EQ Low Freq	32Hz(04)...2.0kHz(28)		11(140kHz)
07	1	34 - 4C	2-Band EQ Low Gain	-12dB(34)...0(40)...+12dB(4C)		40(+0dB)
08	1	0E - 36	2-Band EQ Mid Freq	100Hz(0E)...10.0kHz(36)		28(2.0kHz)
09	1	34 - 4C	2-Band EQ Mid Gain	-12dB(34)...0(40)...+12dB(4C)		40(+0dB)
0A	1	0A - 78	2-Band EQ Mid Resonance(Q)	1.0(0A)...12.0(78)		0A(1.0)
0B	1		reserve			
0C	1	00 - 7F	Filter Cutoff	0...127		7F(127)
0D	1	00 - 74	Filter Resonance(Q)	-16(00)...0(10)...+100(74)		10(0)
0E	1	00 - 05	Filter Type	0(LPF24), 1(LPF18), 2(LPF12), 3(BPF), 4(HPF12), 5(BEF)		00(LFP24)
0F	1	00 - 7F	Filter Cutoff Scaling Depth	-64...0...+63		40(0)
10	1	00 - 63	Filter Cutoff Modulation Depth	0...99		0
11	1	34 - 4C	Filter Input Gain	-12dB(34)...0(40)...+12dB(4C)		40(0)
12	1	00 - 7F	FEG Attack	0...127		00(0)
13	1	00 - 7F	FEG Decay	0...127		00(0)
14	1	00 - 7F	FEG Sustain	0...127		00(0)
15	1	00 - 7F	FEG Release	0...127		00(0)
16	1	00 - 7F	FEG Depth	-64...0...+63		40(0)
17	1	00 - 7F	FEG Depth Velocity Sense	-64...0...+63		40(0)
18	1		reserve			
19	1	00 - 0F	Noise OSC Type	(*1)		00(White)
1A	1	00 - 7F	Mixer Voice Level	0...127		7F(127)
1B	1	00 - 7F	Mixer Noise Level	0...127		00(0)
1C	1	00 - 7F	Modulator 1 Harmonic	-64...0...+63	Relative Offset	40(0)
1D	1	00 - 7F	Modulator 2 Harmonic	-64...0...+63	Relative Offset	40(0)
1E	1	00 - 7F	Modulator 3 Harmonic	-64...0...+63	Relative Offset	40(0)
1F	1	00 - 7F	Modulator 1 FM Depth	-64...0...+63	Relative Offset	40(0)
20	1	00 - 7F	Modulator 2 FM Depth	-64...0...+63	Relative Offset	40(0)
21	1	00 - 7F	Modulator 3 FM Depth	-64...0...+63	Relative Offset	40(0)
22	1	00 - 7F	Modulator 1 EG Decay	-64...0...+63	Relative Offset	40(0)
23	1	00 - 7F	Modulator 2 EG Decay	-64...0...+63	Relative Offset	40(0)
24	1	00 - 7F	Modulator 3 EG Decay	-64...0...+63	Relative Offset	40(0)
25	1	00 - 7F	AEG Attack	-64...0...+63	Relative Offset	40(0)
26	1	00 - 7F	AEG Decay	-64...0...+63	Relative Offset	40(0)
27	1	00 - 7F	AEG Sutain	-64...0...+63	Relative Offset	40(0)
28	1	00 - 7F	AEG Release	-64...0...+63	Relative Offset	40(0)

Total Size   29

<1-4>

MIDI Parameter Change table (Current Voice Common 2)

Address High Mid Low (H)	Size (H)	Data (H)	Parameter	Description		Default (H)
10 01 00	1	00 - 03	Modulator Select	0(3), 1(2), 2(1), 3(All)		03(All)
01	1	00 - 7F	Scene Control	0(Scene1)...64(Half Value Scene1 & 2)...127(Scene2)		00(Scene1)
02	2	00 - 4A / 00 - 7F	Common Tempo	20.0(14)...300.0(12C)	(*2)	8C(140)
04	1	32 - 53	Play Effect Swing	50%(32)...83%(53)		32(50%)

Total Size   05

(*1) Noise Type List

00	White
01	Pink
02	Up Slow
03	Up Mid
04	Up High
05	Down Slow
06	Down Mid
07	Down High
08	Pitch Scale 1
09	Pitch Scale 2
0A	Pitch Scale 3
0B	Pitch Scale 4
0C	Variation 1
0D	Variation 2
0E	Variation 3
0F	Variation 4

(*2)   02   (one decimal place x8)+(whole number/128)ex) 155.5 : (5 x 8) + (155 / 128) = 41(29h)
03   The remainder of whole number devided by 128   the remainder of (155 / 128) = 27(1Bh)

<1-5>

MIDI Parameter Change table (Current Voice Scene 1)

Address High Mid Low (H)	Size (H)	Data (H)	Parameter	Description		Default (H)
10 03 00	1	00 - 7F	Filter Cutoff	0...127		7F(127)
	1	00 - 74	Filter Resonance(Q)	-16(00)...0(10)...+100(74)		10(0)
	1	00 - 7F	FEG Attack	0...127		00(0)
	1	00 - 7F	FEG Decay	0...127		00(0)
	1	00 - 7F	FEG Sustain	0...127		00(0)
	1	00 - 7F	FEG Release	0...127		00(0)
	1	00 - 7F	FEG Depth	-64...0...+63		40(0)
	1	00 - 05	Filter Type	0(LPF24), 1(LPF18), 2(LPF12), 3(BPF), 4(HPF12), 5(BEF)		00(LFP24)
	1	00 - 63	LFO Speed	0...99		00(0)
	1	00 - 63	Portamento Time	0...99		00(0)
	1	00 - 7F	Mixer Noise Level	0...127		00(0)
	1	00 - 7F	Modulator 1 Harmonic	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 2 Harmonic	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 3 Harmonic	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 1 FM Depth	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 2 FM Depth	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 3 FM Depth	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 1 EG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 2 EG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 3 EG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Attack	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Sutain	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Release	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	VOLUME	0 - 127		64
	1	00 - 7F	PAN	CENTER(0),L63...C...R63(1...64...127)		40
	1	00 - 7F	EFFECT SEND	0 - 127		00
	1	00 - 7F	EFFECT PARAMETER	refer to Effect Type List		00
Total Size	1C					

<1-6>

MIDI Parameter Change table (Current Voice Scene 2)

Address High Mid Low (H)	Size (H)	Data (H)	Parameter	Description		Default (H)
10 04 00	1	00 - 7F	Filter Cutoff	0...127		7F(127)
	1	00 - 74	Filter Resonance(Q)	-16(00)...0(10)...+100(74)		10(0)
	1	00 - 7F	FEG Attack	0...127		00(0)
	1	00 - 7F	FEG Decay	0...127		00(0)
	1	00 - 7F	FEG Sustain	0...127		00(0)
	1	00 - 7F	FEG Release	0...127		00(0)
	1	00 - 7F	FEG Depth	-64...0...+63		40(0)
	1	00 - 05	Filter Type	0(LPF24), 1(LPF18), 2(LPF12), 3(BPF), 4(HPF12), 5(BEF)		00(LFP24)
	1	00 - 63	LFO Speed	0...99		00(0)
	1	00 - 63	Portamento Time	0...99		00(0)
	1	00 - 7F	Mixer Noise Level	0...127		00(0)
	1	00 - 7F	Modulator 1 Harmonic	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 2 Harmonic	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 3 Harmonic	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 1 FM Depth	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 2 FM Depth	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 3 FM Depth	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 1 EG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 2 EG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 3 EG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Attack	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Sutain	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Release	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	VOLUME	0 - 127		64
	1	00 - 7F	PAN	CENTER(0),L63...C...R63(1...64...127)		40
	1	00 - 7F	EFFECT SEND	0 - 127		00
	1	00 - 7F	EFFECT PARAMETER	refer to Effect Type List		00
Total Size	1C					

<1-7>

MIDI Parameter Change table (Current Voice FreeEG)

Address (H)	Size (H)	Data (H)	Prameter Name	Description		Default
10 02 00	1	00...03	Free EG Trigger	free(0),midi in notes(1),all notes(2),seq start(3)		03(seq start)
01	1	00...04	Free EG Loop Type	off(0),forward(1),forwardd-half(2), alternate(3),alternate-half(4)		01(forward)
02	1	02...60	Free EG Length	1/2bar(2),1bar(3),3/2bars(4), 2bars(5),3bars(6),4bars(7),6bars(8), 8bars(9),1.0sec(0A)...8.0sec(50) ...16.0sec(60)		05(2bars)
03	1	00...7F	Free EG Keyboard Track	-64...+63		40(+0)
04	1	00...1F	Free EG Trk Param 1	off(0)...Track Level(1F)	*2	00(off)
05	1	00...01	Free EG Trk Scene Switch 1	off(0),on(1)		00(off)
06	1	00...1F	Free EG Trk Param 2	off(0)...Track Level(1F)	*2	00(off)
07	1	00...01	Free EG Trk Scene Switch 2	off(0),on(1)		00(off)
08	1	00...1F	Free EG Trk Param 3	off(0)...Track Level(1F)	*2	00(off)
09	1	00...01	Free EG Trk Scene Switch 3	off(0),on(1)		00(off)
0a	1	00...1F	Free EG Trk Param 4	off(0)...Track Level(1F)	*2	00(off)
0b	1	00...01	Free EG Trk Scene Switch 4	off(0),on(1)		00(off)
0c	2	00...01	Free EG Trk1 Data1 MSB	0...1	*8	1
		00...7F	Free EG Trk1 Data1 LSB	0...127	*8	0
0e	2	00...01	Free EG Trk1 Data2 MSB	0...1	*8	1
		00...7F	Free EG Trk1 Data2 LSB	0...127	*8	0
: : :						
05 0a	2	00...01	Free EG Trk1 Data192 MSB	0...1	*8	1

			00...7F	Free EG Trk1 Data192 LSB	0...127		*8	0
05	0c	2	00...01	Free EG Trk2 Data1 MSB	0...1		*8	1
			00...7F	Free EG Trk2 Data1 LSB	0...127		*8	0
05	0e	2	00...01	Free EG Trk2 Data2 MSB	0...1		*8	1
			00...7F	Free EG Trk2 Data2 LSB	0...127		*8	0
:	:	:						
08	0a	2	00...01	Free EG Trk2 Data192 MSB	0...1		*8	1
			00...7F	Free EG Trk2 Data192 LSB	0...127		*8	0
08	0c	2	00...01	Free EG Trk3 Data1 MSB	0...1		*8	1
			00...7F	Free EG Trk3 Data1 LSB	0...127		*8	0
08	0e	2	00...01	Free EG Trk3 Data2 MSB	0...1		*8	1
			00...7F	Free EG Trk3 Data2 LSB	0...127		*8	0
:	:	:						
0b	0a	2	00...01	Free EG Trk3 Data192 MSB	0...1		*8	1
			00...7F	Free EG Trk3 Data192 LSB	0...127		*8	0
0b	0c	2	00...01	Free EG Trk4 Data1 MSB	0...1		*8	1
			00...7F	Free EG Trk4 Data1 LSB	0...127		*8	0
0b	0e	2	00...01	Free EG Trk4 Data2 MSB	0...1			
			00...7F	Free EG Trk4 Data2 LSB	0...127		*8	0
:	:	:						
0e	0a	2	00...01	Free EG Trk4 Data192 MSB	0...1		*8	1
			00...7F	Free EG Trk4 Data192 LSB	0...127		*8	0

TOTAL SIZE   60C

*2 : Free EG Track Parameter List

Value	Parameter Name
00	off
01	Portament Time
02	LFO Speed
03	Modulator 1 Harmonic
04	Modulator 2 Harmonic
05	Modulator 3 Harmonic
06	Modulator All Harmonic
07	Modulator 1 FM Depth
08	Modulator 2 FM Depth
09	Modulator 3 FM Depth
0A	Modulator All FM Depth
0B	Modulator 1 EG Decay
0C	Modulator 2 EG Decay
0D	Modulator 3 EG Decay
0E	Modulator All EG Decay
0F	Noise Level
10	Filter Type
11	Filter Cutoff
12	Filter Resonance(Q)
13	FEG Attack
14	FEG Decay
15	FEG Sustain
16	FEG Release
17	FEG Depth
18	AEG Attack
19	AEG Decay
1A	AEG Sutain
1B	AEG Release
1C	EFFECT Param
1D	EFFECT Wet Level
1E	Track Pan
1F	Track Level

*8 : receive only bulk dump

<1-8>

MIDI Bulk Dump Parameter table (Current Seq Pattern)

Address (H)	Size (H)	Data (H)	Prameter Name	Description	Default
10 40 00	1	04,06,07	Step Seq Base Unit	1/8(4)…1/12(6)...1/16(7)	07(1/16)
	1	08,0C,10	Step Seq Length	8step(8),12step(C),16steps(10)	10
	1		NOT USED		--
	1		NOT USED		--
	1		NOT USED		--
	1		NOT USED		--
	1	00...7F	Step Seq Note No 1	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 2	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 3	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 4	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 5	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 6	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 7	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 8	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 9	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 10	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 11	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 12	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 13	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 14	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 15	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Note No 16	C-2(0)...G8(7F)	C3(3C)
	1	00...7F	Step Seq Velocity 1	rest(0),1...127	100(64)
	1	00...7F	Step Seq Velocity 2	rest(0),1...127	100(64)
	1	00...7F	Step Seq Velocity 3	rest(0),1...127	100(64)
	1	00...7F	Step Seq Velocity 4	rest(0),1...127	100(64)
	1	00...7F	Step Seq Velocity 5	rest(0),1...127	100(64)
	1	00...7F	Step Seq Velocity 6	rest(0),1...127	100(64)
	1	00...7F	Step Seq Velocity 7	rest(0),1...127	100(64)
	1	00...7F	Step Seq Velocity 8	rest(0),1...127	100(64)
	1	00...7F	Step Seq Velocity 9	rest(0),1...127	100(64)
	1	00...7F	Step Seq Velocity 10	rest(0),1...127	100(64)

1	00...7F	Step Seq Velocity 11	rest(0),1...127			100(64)
1	00...7F	Step Seq Velocity 12	rest(0),1...127			100(64)
1	00...7F	Step Seq Velocity 13	rest(0),1...127			100(64)
1	00...7F	Step Seq Velocity 14	rest(0),1...127			100(64)
1	00...7F	Step Seq Velocity 15	rest(0),1...127			100(64)
1	00...7F	Step Seq Velocity 16	rest(0),1...127			100(64)
1	00...7F	Step Seq Gate Time LSB 1		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 2		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 3		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 4		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 5		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 6		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 7		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 8		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 9		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 10		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 11		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 12		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 13		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 14		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 15		*1		94%(3C)
1	00...7F	Step Seq Gate Time LSB 16		*1		94%(3C)
1	00...7F	Step Seq CtrlChange Value 1	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value 2	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value 3	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value 4	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value 5	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value 6	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value 7	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value 8	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value 9	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value10	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value11	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value12	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value13	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value14	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value15	0...127			0(00)
1	00...7F	Step Seq CtrlChange Value16	0...127			0(00)
1	00…07	Step Seq Gate Time MSB 1	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 2	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 3	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 4	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 5	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 6	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 7	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 8	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 9	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 10	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 11	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 12	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 13	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 14	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 15	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…07	Step Seq Gate Time MSB 16	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2		0
1	00…01	Step Seq Mute 1	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 2	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 3	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 4	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 5	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 6	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 7	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 8	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 9	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 10	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 11	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 12	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 13	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 14	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 15	MuteOFF(0),MuteON(1)			MuteOFF(0)
1	00…01	Step Seq Mute 16	MuteOFF(0),MuteON(1)			MuteOFF(0)

TOTAL SIZE   66

*1 : MSB bit 2-0 -> bit 9-7
    LSB bit 6 -0 -> bit 6-0
*2 : This should be transmitted after sending Step Seq Gate Time LSB n.

<1-9>

MIDI Bulk Dump Parameter table (User Pattern Voice Common 1)

Address	Size	Data	Parameter	Description	Default
High Mid Low					
(H)	(H)	(H)			(H)
20 mm 00	1	00 - 01	Distortion : Off/On	0(Off), 1(On)	00(Off)
	1	00 - 64	Distortion : Drive	0...100	40(100)
	1	00 - 03	Distortion : AMP Type	off, stack, combo, tube	01(stack)
	1	22 - 3C	Distortion : LPF Cutoff	1.0k~Thru	30(5.0kHz)
	1	00 - 64	Distortion : Out Level	0~100	3C(60)
	1	01 - 7F	Distortion : Dry/Wet	D63>W(1)...D=W(40)...D<W63(7F)	01(D63>W)
	1	04 - 28	2-Band EQ Low Freq	32Hz(04)...2.0kHz(28)	11(140kHz)
	1	34 - 4C	2-Band EQ Low Gain	-12dB(34)...0(40)...+12dB(4C)	40(+0dB)
	1	0E - 36	2-Band EQ Mid Freq	100Hz(0E)...10.0kHz(36)	28(2.0kHz)
	1	34 - 4C	2-Band EQ Mid Gain	-12dB(34)...0(40)...+12dB(4C)	40(+0dB)
	1	0A - 78	2-Band EQ Mid Resonance(Q)	1.0(0A)...12.0(78)	0A(1.0)
	1		reserve		
	1	00 - 7F	Filter Cutoff	0...127	7F(127)
	1	00 - 74	Filter Resonance(Q)	-16(00)...0(10)...+100(74)	10(0)
	1	00 - 05	Filter Type	0(LPF24), 1(LPF18), 2(LPF12), 3(BPF), 4(HPF12), 5(BEF)	00(LFP24)
	1	00 - 7F	Filter Cutoff Scaling Depth	-64...0...+63	40(0)
	1	00 - 63	Filter Cutoff Modulation Depth	0...99	0

131

1	34 - 4C		Filter Input Gain	-12dB(34)...0(40)...+12dB(4C)			40(0)
1	00 - 7F		FEG Attack	0...127			00(0)
1	00 - 7F		FEG Decay	0...127			00(0)
1	00 - 7F		FEG Sustain	0...127			00(0)
1	00 - 7F		FEG Release	0...127			00(0)
1	00 - 7F		FEG Depth	-64...0...+63			40(0)
1	00 - 7F		FEG Depth Velocity Sense	-64...0...+63			40(0)
1			reserve				
1	00 - 0F		Noise OSC Type	(*1)			00(White)
1	00 - 7F		Mixer Voice Level	0...127			7F(127)
1	00 - 7F		Mixer Noise Level	0...127			00(0)
1	00 - 7F		Modulator 1 Harmonic	-64...0...+63		Relative Offset	40(0)
1	00 - 7F		Modulator 2 Harmonic	-64...0...+63		Relative Offset	40(0)
1	00 - 7F		Modulator 3 Harmonic	-64...0...+63		Relative Offset	40(0)
1	00 - 7F		Modulator 1 FM Depth	-64...0...+63		Relative Offset	40(0)
1	00 - 7F		Modulator 2 FM Depth	-64...0...+63		Relative Offset	40(0)
1	00 - 7F		Modulator 3 FM Depth	-64...0...+63		Relative Offset	40(0)
1	00 - 7F		Modulator 1 EG Decay	-64...0...+63		Relative Offset	40(0)
1	00 - 7F		Modulator 2 EG Decay	-64...0...+63		Relative Offset	40(0)
1	00 - 7F		Modulator 3 EG Decay	-64...0...+63		Relative Offset	40(0)
1	00 - 7F		AEG Attack	-64...0...+63		Relative Offset	40(0)
1	00 - 7F		AEG Decay	-64...0...+63		Relative Offset	40(0)
1	00 - 7F		AEG Sutain	-64...0...+63		Relative Offset	40(0)
1	00 - 7F		AEG Release	-64...0...+63		Relative Offset	40(0)
Total Size	29						

<1-10>

MIDI Bulk Dump Parameter table (User Pattern Voice Common 2)

Address High Mid Low (H)	Size (H)	Data (H)	Parameter	Description		Default (H)
21 mm 00	1	00 - 03	Modulator Select	0(3), 1(2), 2(1), 3(All)		03(All)
	1	00 - 7F	Scene Control	0(Scene1)...64(Half Value Scene1 & 2)...127(Scene2)		00(Scene1)
	2	00 - 4A 00 - 7F	Common Tempo	20.0(14)...300.0(12C)	(*2)	8C(140)
	1	32 - 53	Play Effect Swing	50%(32)...83%(53)		32(50%)
Total Size	05					

    (*1) Noise Type List

00	White
01	Pink
02	Up Slow
03	Up Mid
04	Up High
05	Down Slow
06	Down Mid
07	Down High
08	Pitch Scale 1
09	Pitch Scale 2
0A	Pitch Scale 3
0B	Pitch Scale 4
0C	Variation 1
0D	Variation 2
0E	Variation 3
0F	Variation 4

(*2)	02	(one decimal place x8)+(whole number/128)ex) 155.5 : (5 x 8) + (155 / 128) = 41(29h)
	03	The remainder of whole number devided by 128 the remainder of (155 / 128) = 27(1Bh)

    mm = 00 ~ 7F : User Voice No.1 ~ User Voice No.128

<1-11>

MIDI Bulk Dump Parameter table (User Pattern Voice Scene 1)

Address High Mid Low (H)	Size (H)	Data (H)	Parameter	Description		Default (H)
40 mm 00	1	00 - 7F	Filter Cutoff	0...127		7F(127)
	1	00 - 74	Filter Resonance(Q)	-16(00)...0(10)...+100(74)		10(0)
	1	00 - 7F	FEG Attack	0...127		00(0)
	1	00 - 7F	FEG Decay	0...127		00(0)
	1	00 - 7F	FEG Sustain	0...127		00(0)
	1	00 - 7F	FEG Release	0...127		00(0)
	1	00 - 7F	FEG Depth	-64...0...+63		40(0)
	1	00 - 05	Filter Type	0(LPF24), 1(LPF18), 2(LPF12), 3(BPF), 4(HPF12), 5(BEF)		00(LFP24)
	1	00 - 63	LFO Speed	0...99		00(0)
	1	00 - 63	Portamento Time	0...99		00(0)
	1	00 - 7F	Mixer Noise Level	0...127		00(0)
	1	00 - 7F	Modulator 1 Harmonic	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 2 Harmonic	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 3 Harmonic	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 1 FM Depth	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 2 FM Depth	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 3 FM Depth	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 1 EG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 2 EG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 3 EG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Attack	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Sutain	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Release	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	VOLUME	0 - 127		64
	1	00 - 7F	PAN	CENTER(0),L63...C...R63(1...64...127)		40
	1	00 - 7F	EFFECT SEND	0 - 127		00
	1	00 - 7F	EFFECT PARAMETER	refer to Effect Type List		00
Total Size	1C					

132

<1-12>

MIDI Bulk Dump Parameter table (User Pattern Voice Scene 2)

Address High Mid Low (H)	Size (H)	Data (H)	Parameter	Description		Default (H)
41 mm 00	1	00 - 7F	Filter Cutoff	0...127		7F(127)
	1	00 - 74	Filter Resonance(Q)	-16(00)...0(10)...+100(74)		10(0)
	1	00 - 7F	FEG Attack	0...127		00(0)
	1	00 - 7F	FEG Decay	0...127		00(0)
	1	00 - 7F	FEG Sustain	0...127		00(0)
	1	00 - 7F	FEG Release	0...127		00(0)
	1	00 - 7F	FEG Depth	-64...0...+63		40(0)
	1	00 - 05	Filter Type	0(LPF24), 1(LPF18), 2(LPF12), 3(BPF), 4(HPF12), 5(BEF)		00(LFP24)
	1	00 - 63	LFO Speed	0...99		00(0)
	1	00 - 63	Portamento Time	0...99		00(0)
	1	00 - 7F	Mixer Noise Level	0...127		00(0)
	1	00 - 7F	Modulator 1 Harmonic	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 2 Harmonic	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 3 Harmonic	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 1 FM Depth	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 2 FM Depth	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 3 FM Depth	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 1 EG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 2 EG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	Modulator 3 EG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Attack	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Decay	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Sutain	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	AEG Release	-64...0...+63	Relative Offset	40(0)
	1	00 - 7F	VOLUME	0 - 127		64
	1	00 - 7F	PAN	CENTER(0),L63...C...R63(1...64...127)		40
	1	00 - 7F	EFFECT SEND	0 - 127		00
	1	00 - 7F	EFFECT PARAMETER	refer to Effect Type List		00
Total Size	1C					

    mm = 00 ~ 7F : User Voice No.1 ~ User Voice No.128

<1-13>

MIDI Bulk Dump Parameter table (User Pattern Voice FreeEG)

Address (H)	Size (H)	Data (H)	Prameter Name	Description		Default
3n xx 00	1	00...03	Free EG Trigger	free(0),midi in notes(1),all notes(2),seq start(3)		03(seq start)
01	1	00...04	Free EG Loop Type	off(0),forwardd(1),forwardd-half(2), alternate(3),alternate-half(4)		01(forward)
02	1	02...60	Free EG Length	1/2bar(2),1bar(3),3/2bars(4), 2bars(5),3bars(6),4bars(7),6bars(8), 8bars(9),1.0sec(0A)...8.0sec(50) ...16.0sec(60)		05(2bars)
03	1	00...7F	Free EG Keyboard Track	-64...+63		40(+0)
04	1	00...1F	Free EG Trk Param 1	off(0)...Track Level(1F)	*7	00(off)
05	1	00...01	Free EG Trk Scene Switch 1	off(0),on(1)		00(off)
06	1	00...1F	Free EG Trk Param 2	off(0)...Track Level(1F)	*7	00(off)
07	1	00...01	Free EG Trk Scene Switch 2	off(0),on(1)		00(off)
08	1	00...1F	Free EG Trk Param 3	off(0)...Track Level(1F)	*7	00(off)
09	1	00...01	Free EG Trk Scene Switch 3	off(0),on(1)		00(off)
0a	1	00...1F	Free EG Trk Param 4	off(0)...Track Level(1F)	*7	00(off)
0b	1	00...01	Free EG Trk Scene Switch 4	off(0),on(1)		00(off)
0c	2	00...01	Free EG Trk1 Data1 MSB	0...1	*8	1
		00...7F	Free EG Trk1 Data1 LSB	0...127	*8	0
0e	2	00...01	Free EG Trk1 Data2 MSB	0...1	*8	1
		00...7F	Free EG Trk1 Data2 LSB	0...127	*8	0
: : :						
03 0a	2	00...01	Free EG Trk1 Data192 MSB	0...1	*8	1
		00...7F	Free EG Trk1 Data192 LSB	0...127	*8	0
03 0c	2	00...01	Free EG Trk2 Data1 MSB	0...1	*8	1
		00...7F	Free EG Trk2 Data1 LSB	0...127	*8	0
03 0e	2	00...01	Free EG Trk2 Data2 MSB	0...1	*8	1
		00...7F	Free EG Trk2 Data2 LSB	0...127	*8	0
: : :						
06 0a	2	00...01	Free EG Trk2 Data192 MSB	0...1	*8	1
		00...7F	Free EG Trk2 Data192 LSB	0...127	*8	0
06 0c	2	00...01	Free EG Trk3 Data1 MSB	0...1	*8	1
		00...7F	Free EG Trk3 Data1 LSB	0...127	*8	0
06 0e	2	00...01	Free EG Trk3 Data2 MSB	0...1	*8	1
		00...7F	Free EG Trk3 Data2 LSB	0...127	*8	0
: : :						
09 0a	2	00...01	Free EG Trk3 Data192 MSB	0...1	*8	1
		00...7F	Free EG Trk3 Data192 LSB	0...127	*8	0
09 0c	2	00...01	Free EG Trk4 Data1 MSB	0...1	*8	1
		00...7F	Free EG Trk4 Data1 LSB	0...127	*8	0
09 0e	2	00...01	Free EG Trk4 Data2 MSB	0...1		
		00...7F	Free EG Trk4 Data2 LSB	0...127	*8	0
: : :						
0C 0a	2	00...01	Free EG Trk4 Data192 MSB	0...1	*8	1
		00...7F	Free EG Trk4 Data192 LSB	0...127	*8	0
TOTAL SIZE	60C					

133

<1-14>

MIDI Bulk Dump Parameter table (User Pattern Step Seq Pattern)

Address (H)	Size (H)	Data (H)	Prameter Name	Description		Default
50 nn 00	1	04,06,07	Step Seq Base Unit	1/8(4)...1/12(6)...1/16(7)		07(1/16)
	1	08,0C,10	Step Seq Length	8step(8),12step(C),16steps(10)		10
	1		NOT USED			--
	1		NOT USED			--
	1		NOT USED			--
	1		NOT USED			--
	1	00...7F	Step Seq Note No 1	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 2	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 3	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 4	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 5	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 6	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 7	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 8	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 9	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 10	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 11	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 12	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 13	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 14	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 15	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Note No 16	C-2(0)...G8(7F)		C3(3C)
	1	00...7F	Step Seq Velocity 1	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 2	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 3	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 4	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 5	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 6	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 7	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 8	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 9	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 10	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 11	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 12	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 13	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 14	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 15	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 16	rest(0),1...127		100(64)
	1	00...7F	Step Seq Gate Time LSB 1		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 2		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 3		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 4		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 5		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 6		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 7		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 8		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 9		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 10		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 11		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 12		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 13		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 14		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 15		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 16		*1	94%(3C)
	1	00...7F	Step Seq CtrlChange Value 1	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value 2	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value 3	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value 4	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value 5	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value 6	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value 7	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value 8	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value 9	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value10	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value11	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value12	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value13	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value14	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value15	0...127		0(00)
	1	00...7F	Step Seq CtrlChange Value16	0...127		0(00)
	1	00...7F	Step Seq Gate Time MSB 1	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 2	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 3	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 4	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 5	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 6	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 7	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 8	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 9	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 10	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 11	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 12	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 13	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 14	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 15	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...7F	Step Seq Gate Time MSB 16	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...01	Step Seq Mute 1	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00...01	Step Seq Mute 2	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00...01	Step Seq Mute 3	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00...01	Step Seq Mute 4	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00...01	Step Seq Mute 5	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00...01	Step Seq Mute 6	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00...01	Step Seq Mute 7	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00...01	Step Seq Mute 8	MuteOFF(0),MuteON(1)		MuteOFF(0)

1	00...01	Step Seq Mute 9	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00...01	Step Seq Mute 10	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00...01	Step Seq Mute 11	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00...01	Step Seq Mute 12	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00...01	Step Seq Mute 13	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00...01	Step Seq Mute 14	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00...01	Step Seq Mute 15	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00...01	Step Seq Mute 16	MuteOFF(0),MuteON(1)	MuteOFF(0)

TOTAL SIZE   66

nn = User Pattern Number (0 - 7F)

*1 : MSB bit 2-0 -> bit 9-7
        LSB bit 6 -0 -> bit 6-0
*2 : This should be transmitted after sending Step Seq Gate Time LSB n.

<2-1>

Parameter Group Number

Parameter			parameter#
Group No.		Description	
g	h		
00	00	VCED(Voice Edit Buffer)	0 ... 127
00	01	VCED(Voice Edit Buffer)	0 ... 28
06	00	ACED(Additional Edit Buffer)	0 ... 73

<2-2>

MIDI Parameter Change table (DX Voice Parameter - VCED format)

Parameter Group#		Parameter#						Size	Data	Parameter	Description	Default
g	h	OP6	OP5	OP4	OP3	OP2	OP1					
(H)	(H)	(H)	(H)	(H)	(H)	(H)	(H)	(H)	(H)			(H)
00	00	00	15	2A	3F	54	69	1	00 - 63	EG RATE1	0 ... 99	63
	00	01	16	2B	40	55	6A	1	00 - 63	EG RATE2	0 ... 99	63
	00	02	17	2C	41	56	6B	1	00 - 63	EG RATE3	0 ... 99	63
	00	03	18	2D	42	57	6C	1	00 - 63	EG RATE4	0 ... 99	63
	00	04	19	2E	43	58	6D	1	00 - 63	EG LELEL1	0 ... 99	63
	00	05	1A	2F	44	59	6E	1	00 - 63	EG LELEL2	0 ... 99	63
	00	06	1B	30	45	5A	6F	1	00 - 63	EG LELEL3	0 ... 99	63
	00	07	1C	31	46	5B	70	1	00 - 63	EG LELEL4	0 ... 99	00
	00	08	1D	32	47	5C	71	1	00 - 63	BREAK POINT	A-1 ... C8	27
	00	09	1E	33	48	5D	72	1	00 - 63	LEFT DEPTH	0 ... 99	00
	00	0A	1F	34	49	5E	73	1	00 - 63	RIGHT DEPTH	0 ... 99	00
	00	0B	20	35	4A	5F	74	1	00 - 03	LEFT CURVE	-lin,-exp,+exp,+lin	00
	00	0C	21	36	4B	60	75	1	00 - 03	RIGHT CURVE	-lin,-exp,+exp,+lin	00
	00	0D	22	37	4C	61	76	1	00 - 07	RATE SCALING	0 ... 7	00
	00	0E	23	38	4D	62	77	1	00 - 03	AMPLITUDE MODULATION SENSITIVITY	0 ... 3	00
	00	0F	24	39	4E	63	78	1	00 - 07	TOUCH SENSITIVITY	0 ... 7	00
	00	10	25	3A	4F	64	79	1	00 - 63	TOTAL LEVEL	0 ... 99	OP1=99,otherOP=0
	00	11	26	3B	50	65	7A	1	00 - 01	FREQUENCY MODE	ratio,fixed	00
	00	12	27	3C	51	66	7B	1	00 - 1F	FREQUENCY COURSE	0 ... 31	01
	00	13	28	3D	52	67	7C	1	00 - 63	FREQUENCY FINE	0 ... 99	00
	00	14	29	3E	53	68	7D	1	00 - 0E	DETUNE	-7 ... 0 ... +7	07
	00						7E	1	00 - 63	PEG RATE1	0 ... 99	63
	00						7F	1	00 - 63	PEG RATE2	0 ... 99	63
	01						00	1	00 - 63	PEG RATE3	0 ... 99	63
	01						01	1	00 - 63	PEG RATE4	0 ... 99	63
	01						02	1	00 - 63	PEG LEVEL1	0 ... 99	32
	01						03	1	00 - 63	PEG LEVEL2	0 ... 99	32
	01						04	1	00 - 63	PEG LEVEL3	0 ... 99	32
	01						05	1	00 - 63	PEG LEVEL4	0 ... 99	32
	01						06	1	00 - 1F	ALGORITHM SELECTOR	1 ... 32	00
	01						07	1	00 - 07	FEEDBACK LEVEL	0 ... 7	00
	01						08	1	00 - 01	OSC PHASE INIT	off,on	01
	01						09	1	00 - 63	LFO SPEED	0 ... 99	23
	01						0A	1	00 - 63	LFO DELAY TIME	0 ... 99	00
	01						0B	1	00 - 63	PITCH MODULATION DEPTH	0 ... 99	00
	01						0C	1	00 - 63	AMPLITUDE MODULATION DEPTH	0 ... 99	00
	01						0D	1	00 - 01	LFO KEY SYNC	off,on	01
	01						0E	1	00 - 05	LFO WAVE	triangle,sawdown,sawup,square, sine,s/hold	00
	01						0F	1	00 - 07	LFO PITCH MODULATION SENSITIVITY	0 ... 7	03
	01						10	1	00 - 30	TRANSPOSE	C1 ... C5	18
	01						11	1	20 - 7F	VOICE NAME	32 ... 127 (ASCII CHARACTER)	'I'
	01						12	1	20 - 7F	VOICE NAME	32 ... 127 (ASCII CHARACTER)	'n'
	01						13	1	20 - 7F	VOICE NAME	32 ... 127 (ASCII CHARACTER)	'i'
	01						14	1	20 - 7F	VOICE NAME	32 ... 127 (ASCII CHARACTER)	't'
	01						15	1	20 - 7F	VOICE NAME	32 ... 127 (ASCII CHARACTER)	' '
	01						16	1	20 - 7F	VOICE NAME	32 ... 127 (ASCII CHARACTER)	'P'
	01						17	1	20 - 7F	VOICE NAME	32 ... 127 (ASCII CHARACTER)	't'
	01						18	1	20 - 7F	VOICE NAME	32 ... 127 (ASCII CHARACTER)	'n'
	01						19	1	20 - 7F	VOICE NAME	32 ... 127 (ASCII CHARACTER)	' '
	01						1A	1	20 - 7F	VOICE NAME	32 ... 127 (ASCII CHARACTER)	' '
TOTAL SIZE							9B					
	01						1B	1	00 - 3F	OPERATOR ENABLE	Bit5:OP1,Bit4:OP2,Bit3:OP3, Bit2:OP4,Bit1:OP5,Bit0:OP6 off,on	3F

135

<2-3>

MIDI Parameter Change table (DX Voice Additional Parameter - ACED format)

Parameter Group#g (H)	h (H)	Parameter# (H)	Size (H)	Data (H)	Parameter	Description	Default (H)
06	00	00	1		NOT USED		--
		01	1		NOT USED		--
		02	1		NOT USED		--
		03	1		NOT USED		--
		04	1		NOT USED		--
		05	1		NOT USED		--
		06	1	00 - 07	OP6 AMPLITUDE MODULATION SENSITIVITY	0 ... 7	00
		07	1	00 - 07	OP5 AMPLITUDE MODULATION SENSITIVITY	0 ... 7	00
		08	1	00 - 07	OP4 AMPLITUDE MODULATION SENSITIVITY	0 ... 7	00
		09	1	00 - 07	OP3 AMPLITUDE MODULATION SENSITIVITY	0 ... 7	00
		0A	1	00 - 07	OP2 AMPLITUDE MODULATION SENSITIVITY	0 ... 7	00
		0B	1	00 - 07	OP1 AMPLITUDE MODULATION SENSITIVITY	0 ... 7	00
		0C	1	00 - 03	PITCH EG RANGE	8va,2va,1va,1/2va	00
		0D	1	00 - 01	LFO KEY TRIGGER	single,multi	00
		0E	1	00 - 01	PITCH EG BY VELOCITY SWITCH	off,on	00
		0F	1	00 - 03	POLY/MONO,UNISON SWITCH	bit0:poly/mono,bit1:unison off/on	00
		10	1	00 - 0C	PITCH BEND RANGE	0 ... 12	02
		11	1	00 - 0C	PITCH BEND STEP	0 ... 12	00
		12	1		NOT USED		--
		13	1	00 - 07	RANDOM PITCH FLUCTUATION	0 ... 7	00
		14	1	00 - 01	PORTAMENTO MODE	rtn/flw, fingrd/flltm	00
		15	1	00 - 0C	PORTAMENTO STEP	0 ... 12	00
		16	1	00 - 63	PORTAMENTO TIME	0 ... 99	00
		17	1		NOT USED		--
		18	1		NOT USED		--
		19	1		NOT USED		--
		1A	1		NOT USED		--
		1B	1		NOT USED		--
		1C	1		NOT USED		--
		1D	1		NOT USED		--
		1E	1		NOT USED		--
		1F	1		NOT USED		--
		20	1		NOT USED		--
		21	1		NOT USED		--
		22	1		NOT USED		--
		23	1		NOT USED		--
		24	1		NOT USED		--
		25	1		NOT USED		--
		26	1	00 - 07	PITCH EG RATE SCALING DEPTH	0 ... 7	--
		40	1		NOT USED		--
		41	1		NOT USED		--
		42	1		NOT USED		--
		43	1		NOT USED		--
		44	1		NOT USED		--
		45	1		NOT USED		--
		46	1		NOT USED		--
		47	1		NOT USED		--
		48	1	00 - 07	UNISON DETUNE DEPTH	0 ... 7	00
		49	1		NOT USED		--
TOTAL SIZE			31				

<3-1>

Format Number

Format No.	Description	Total Size
00	VCED(Voice Edit Buffer)	155
05	ACED(Additional Edit Buffer)	49
06	AMEM(packed 32 supplement)	1120
09	VMEM(packed 32 voice)	4096

<3-2>

DX Packed Voice Parameter - VMEM format

OP6 (H)	OP5 (H)	OP4 (H)	OP3 (H)	OP2 (H)	OP1 (H)	Size (H)	Parameter
00	11	22	33	44	55	1	EG RATE1
01	12	23	34	45	56	1	EG RATE2
02	13	24	35	46	57	1	EG RATE3
03	14	25	36	47	58	1	EG RATE4
04	15	26	37	48	59	1	EG LELEL1
05	16	27	38	49	5A	1	EG LELEL2
06	17	28	39	4A	5B	1	EG LELEL3
07	18	29	3A	4B	5C	1	EG LELEL4
08	19	2A	3B	4C	5D	1	BREAK POINT
09	1A	2B	3C	4D	5E	1	LEFT DEPTH
0A	1B	2C	3D	4E	5F	1	RIGHT DEPTH
0B	1C	2D	3E	4F	60	1	RIGHT CURVE / LEFT CURVE
0C	1D	2E	3F	50	61	1	DETUNE / RATE SCALING
0D	1E	2F	40	51	62	1	TOUCH SENSITIVITY / AMPLITUDE MODULATION SENSITIVITY
0E	1F	30	41	52	63	1	TOTAL LEVEL
0F	20	31	42	53	64	1	FREQUENCY COURSE / FREQUENCY MODE
10	21	32	43	54	65	1	FREQUENCY FINE

Description

BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
			R1			
			R2			
			R3			
			R4			
			L1			
			L2			
			L3			
			L4			
			BP			
			LD			
			RD			
--			RC		LC	
	PD				RS	
--			TS		AMS	
			TL			
--			PC			PM
			PF			

Parameter# (H)	Size	Parameter	Description
66	1	PEG RATE1	PR1
67	1	PEG RATE2	PR2
68	1	PEG RATE3	PR3
69	1	PEG RATE4	PR4
6A	1	PEG LEVEL1	PL1
6B	1	PEG LEVEL2	PL2
6C	1	PEG LEVEL3	PL3
6D	1	PEG LEVEL4	PL4
6E	1	ALGORITHM SELECTOR	-- / ALS
6F	1	OSC PHASE INIT / FEEDBACK LEVEL	-- / OPI / FBL
70	1	LFO SPEED	LFS
71	1	LFO DELAY TIME	LFD
72	1	PITCH MODULATION DEPTH	LPMD
73	1	AMPLITUDE MODULATION DEPTH	LAMD
74	1	LFO PITCH MODULATION SENSITIVITY / LFO WAVE / LFO KEY SYNC	LPMS / LFW / LFKS
75	1	TRANSPOSE	TRNP
76	1	VOICE NAME	VNAM1
77	1	VOICE NAME	VNAM2
78	1	VOICE NAME	VNAM3
79	1	VOICE NAME	VNAM4
7A	1	VOICE NAME	VNAM5
7B	1	VOICE NAME	VNAM6
7C	1	VOICE NAME	VNAM7
7D	1	VOICE NAME	VNAM8
7E	1	VOICE NAME	VNAM9
7F	1	VOICE NAME	VNAM10
TOTAL SIZE	1000	(80h X 20h = 1000h)	

<3-3>

DX Packed Voice Additional Parameter - AMEM format

Parameter# (H)	Size (H)	Parameter	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
00	1	NOT USED				--			
01	1	AMPLITUDE MODULATION SENSITIVITY	--		OP5			OP6	
02	1	AMPLITUDE MODULATION SENSITIVITY	--		OP3			OP4	
03	1	AMPLITUDE MODULATION SENSITIVITY	--		OP1			OP2	
04	1	RANDOM PITCH / PEG VELOCITY SW / LFO KEY TRIGGER / PEG RANGE	RNDP			VPSW	LTRG	PEGR	
05	1	PITCH BEND RANGE / POLY/MONO,UNISON SWITCH	--		PBR			PMOD	
06	1	PITCH BEND STEP		--			PBS		
07	1	PORTAMENTO STEP / PORTAMENTO MODE	--			PQNT			PORM
08	1	PORTAMENTO TIME				POS			
09	1	NOT USED				--			
0A	1	NOT USED				--			
0B	1	NOT USED				--			
0C	1	NOT USED				--			
0D	1	NOT USED				--			
0E	1	NOT USED				--			
0F	1	NOT USED				--			
10	1	NOT USED				--			
11	1	NOT USED				--			
12	1	NOT USED				--			
13	1	NOT USED				--			
14	1	NOT USED				--			
15	1	NOT USED				--			
16	1	NOT USED				--			
17	1	NOT USED				--			
18	1	PITCH EG RATE SCALING DEPTH		--			PGRS		
19	1	NOT USED				--			
1A	1	NOT USED				--			
1B	1	NOT USED				--			
1C	1	NOT USED				--			
1D	1	NOT USED				--			
1E	1	NOT USED				--			
1F	1	NOT USED				--			
20	1	NOT USED				--			
21	1	NOT USED				--			
22	1	UNISON DETUNE DEPTH		--			UDTN		
TOTAL SIZE	460	(23h X 20h = 460h)							

137

\<4-1\>

Rhythm Track Parameter Base Address

MODEL ID = 6D

Parameter	Address			Description
	(H)	**(M)**	**(L)**	
System	00	00	00	System1
Current Effects	02	01	00	Cuttnet Effect
Current Multi Part	08	00	00	Rhythm Track 1 Part Parameter
	:	:	:	:
		02	00	Rhythm Track 3 Part Parameter
		08	00	Synth Track Part Parameter
Current Rhythm StepSeq	10	00	00	Current Rhythm Trk1 Step Seq
	:	:	:	:
		02	00	Current Rhythm Trk3 Step Seq
User Pattern Rhythm Step Seq	20	00	00	User Pattern Rhythm Trk1 Step Seq 1
	:	:	:	:
		7f	00	User Pattern Rhythm Trk1 Step Seq 128
	21	00	00	User Pattern Rhythm Trk2 Step Seq 1
	:	:	:	:
		7f	00	User Pattern Rhythm Trk2 Step Seq 128
	22	00	00	User Pattern Rhythm Trk3 Step Seq 1
	:	:	:	:
		7f	00	User Pattern Rhythm Trk3 Step Seq 128
User Pattern Effect	30	00	00	User Pattern Effect 1
	:	:	:	:
		7f	00	User Pattern Effect 128
User Pattern Multi Part	40	00	00	Rhythm Trk 1 User Pattern Part 1
	:	:	:	:
		7f	00	Rhythm Trk 1 User Pattern Part 128
	41	00	00	Rhythm Trk 2 User Pattern Part 1
	:	:	:	:
		7f	00	Rhythm Trk 2 User Pattern Part 128
	42	00	00	Rhythm Trk 3 User Pattern Part 1
	:	:	:	:
		7f	00	Rhythm Trk 3 User Pattern Part 128
	48	00	00	Synth Track User Pattern Part 1
	:	:	:	:
		7f	00	Synth Track User Pattern Part 128
User Song	60	00	00	Song1 measure1
	:	:	:	:
		7f	00	Song1 measure128
	:	:	:	:
	69	00	00	Song10 measure1
	:	:	:	:
		7f	00	Song10 measure128
	70	00	00	Song1 measure129
	:	:	:	:
		7f	00	Song1 measure256
	:	:	:	:
	79	00	00	Song10 measure129
	:	:	:	:
		7f	00	Song10 measure256

\<4-2\>

MIDI Parameter Change table (SYSTEM1)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default (H)
00 00 00	1	00-0F,7F	SYNTH Rcv Ch	1...16,OFF	0
01	1	00-0F,7F	RHYTHM1 Rcv Ch	1...16,OFF	1
02	1	00-0F,7F	RHYTHM2 Rcv Ch	1...16,OFF	2
03	1	00-0F,7F	RHYTHM3 Rcv Ch	1...16,OFF	3
04	1		(RESERVED)		--
05			(NOT USED)		--
06	1		(RESERVED)		--
07	2	01...C8	Play Effect Gate Time	1%(1)...200%(C8)	64(100%)
09	1	00...03	Step Seq Loop Type	forward(0),backward(1),alternateA(2), alternateB(3)	00(forward)
TOTAL SIZE	09				

\<4-3\>

MIDI Parameter Change table (CURRENT EFFECT)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default (H)
02 01 00	1	00 - 03	EFFECT TYPE MSB	refer to Effect Type List	00
01	1	00 - 02	EFFECT TYPE LSB	refer to Effect Type List	00
02	1	00 - 7F	EFFECT PARAMETER	refer to Effect Type List	00
TOTAL SIZE	3				

<4-4>
Effect Type List

Type MSB	Type LSB			
	00	**01**	**02**	**03**
00	Delay1(mono)	Delay2(stereo)	Delay3(cross)	Reverb
01	Flanger1	Flanger2	Chorus	--
02	Phaser1	Phaser2	Phaser3	--
03	AmpSim1	AmpSim2	AmpSim3	--

<4-5>

Effect type	Control Paramater	Value		
Delay 1 (mono)	Tempo Sync Resolution	0 - 127		#table3
Delay 2 (stereo)	Tempo Sync Resolution	0 - 127		#table3
Delay 3 (cross)	Tempo Sync Resolution	0 - 127		#table3
Reverb	Reverb Time	0 - 127	0.3 s - 16.0 s	#table2
Flanger 1	LFO Speed	0 - 127	0.00Hz - 39.7Hz	#table1
Flanger 2	LFO Speed	0 - 127	0.00Hz - 39.7Hz	#table1
Chorus	LFO Speed	0 - 127	0.00Hz - 39.7Hz	#table1
Phaser 1	LFO Speed	0 - 127	0.00Hz - 39.7Hz	#table1
Phaser 2	LFO Speed	0 - 127	0.00Hz - 39.7Hz	#table1
Phaser 3	LFO Speed	0 - 127	0.00Hz - 39.7Hz	#table1
AmpSim 1	Drive	0 - 127		
AmpSim 2	Drive	0 - 127		
AmpSim 3	Drive	0 - 127		

<4-6>

table#1
LFO Frequency

Data	Value	Data	Value	Data	Value	Data	Value
0	0.00	32	1.34	64	0.69	96	8.41
1	0.04	33	1.38	65	2.77	97	8.74
2	0.08	34	1.43	66	2.86	98	9.08
3	0.12	35	1.47	67	2.94	99	9.42
4	0.16	36	1.51	68	3.02	100	9.75
5	0.21	37	1.55	69	3.11	101	10.0
6	0.25	38	1.59	70	3.19	102	10.7
7	0.29	39	1.64	71	3.28	103	11.4
8	0.33	40	1.68	72	3.36	104	12.1
9	0.37	41	1.72	73	3.44	105	12.7
10	0.42	42	1.76	74	3.53	106	13.4
11	0.46	43	1.80	75	3.61	107	14.1
12	0.50	44	1.85	76	3.70	108	14.8
13	0.54	45	1.89	77	3.86	109	15.4
14	0.58	46	1.93	78	4.03	110	16.1
15	0.63	47	1.97	79	4.20	111	16.8
16	0.67	48	2.01	80	4.37	112	17.5
17	0.71	49	2.06	81	4.54	113	18.1
18	0.75	50	2.10	82	4.71	114	19.5
19	0.79	51	2.14	83	4.87	115	20.8
20	0.84	52	2.18	84	5.04	116	22.2
21	0.88	53	2.22	85	5.21	117	23.5
22	0.92	54	2.27	86	5.38	118	24.8
23	0.96	55	2.31	87	5.55	119	26.2
24	1.00	56	2.35	88	5.72	120	27.5
25	1.05	57	2.39	89	6.05	121	28.9
26	1.09	58	2.43	90	6.39	122	30.2
27	1.13	59	2.48	91	6.72	123	31.6
28	1.17	60	2.52	92	7.06	124	32.9
29	1.22	61	2.56	93	7.40	125	34.3
30	1.26	62	2.60	94	7.73	126	37.0
31	1.30	63	2.65	95	8.07	127	39.7

table#2
Reverb time

Data	Value	Data	Value
0,1	0.3	64,65	3.5
2,3	0.4	66,67	3.6
4,5	0.5	68,69	3.7
6,7	0.6	70,71	3.8
8,9	0.7	72,73	3.9
10,11	0.8	74,75	4.0
12,13	0.9	76,77	4.1
14,15	1.0	78,79	4.2
16,17	1.1	80,81	4.3
18,19	1.2	82,83	4.4
20,21	1.3	84,85	4.5
22,23	1.4	86,87	4.6
24,25	1.5	88,89	4.7
26,27	1.6	90,91	4.8
28,29	1.7	92,93	4.9
30,31	1.8	94,95	5.0
32,33	1.9	96,97	5.5
34,35	2.0	98,99	6.0
36,37	2.1	100,101	6.5
38,39	2.2	102,103	7.0
40,41	2.3	104,105	7.5
42,43	2.4	106,107	8.0
44,45	2.5	108,109	8.5
46,47	2.6	110,111	9.0
48,49	2.7	112,113	9.5
50,51	2.8	114,115	10.0
52,53	2.9	116,117	11.0
54,55	3.0	118,119	12.0
56,57	3.1	120,121	13.0
58,59	3.2	122,123	14.0
60,61	3.3	124,125	15.0
62,63	3.4	126,127	16.0

table#3
Tempo resolution

Data	Value
0-7	1/32
8-15	1/24
16-23	1/16
24-31	1/12
32-39	3/32
40-47	1/8
48-55	1/6
56-63	3/16
64-71	1/4
72-79	1/3
80-95	3/8
96-127	1/2

<4-7>

MIDI Parameter Change table (User Voice EFFECT)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default (H)
30 nn 00	1	00 - 03	EFFECT TYPE MSB	refer to Effect Type List	00
01	1	00 - 02	EFFECT TYPE LSB	refer to Effect Type List	00
02	1	00 - 7F	EFFECT PARAMETER	refer to Effect Type List	00
TOTAL SIZE 3					

    nn = Pattern Number

<4-8>

MIDI Parameter Change table (MULTI PART)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default (H)
08 pp 00	1		(RESERVED)		--
01	1		(RESERVED)		--
02	1		(RESERVED)		--
03	1		(RESERVED)		--
04	1		(RESERVED)		--
05	1	00 - 7F	VOLUME	0 - 127	64
06	1	00 - 7F	PAN	CENTER/RANDOM (*1) (0),L63...C...R63(1...64...127)	40
07	1	00 - 7F	EFFECT1 SEND	0 - 127	00
08	1		(RESERVED)		--
09	1		(RESERVED)		--
0A	1	00 - 7F	FILTER CUTOFF FREQUENCY (*2)	-64 - +63	40
0B	1	00 - 7F	FILTER RESONANCE (*2)	-64 - +63	40
0C	1		(RESERVED)		--
0D	1		(RESERVED)		--
0E	1		(RESERVED)		--
TOTAL SIZE 0F					

    pp = Part Number (00 - 02 : Rhythm Track 1 - 3, 08 : Synth Track)

    *1) CENTER when pp = 08(Synth Track), RANDOM when pp = 0,1,2(Rhythm Track)
    *2) reserved when pp = 08(Synth Track)

<4-9>

MIDI Parameter Change table (User Voice MULTI PART)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default (H)
4p nn 00	1		(RESERVED)		--
01	1		(RESERVED)		--
02	1		(RESERVED)		--
03	1		(RESERVED)		--
04	1		(RESERVED)		--
05	1	00 - 7F	VOLUME	0 - 127	64
06	1	00 - 7F	PAN	CENTER/RANDOM (*1) (0),L63...C...R63(1...64...127)	40
07	1	00 - 7F	EFFECT1 SEND	0 - 127	00
08	1		(RESERVED)		28
09	1		(RESERVED)		00
0A	1	00 - 7F	FILTER CUTOFF FREQUENCY (*2)	-64 - +63	40
0B	1	00 - 7F	FILTER RESONANCE (*2)	-64 - +63	40
0C	1		(RESERVED)		--
0D	1		(RESERVED)		--
0E	1		(RESERVED)		--
TOTAL SIZE 0F					

    nn = Pattern Number
    p = Part Number (0 - 2 : Rhythm Track 1 - 3, 8 : Synth Track)

    *1) CENTER when pp = 08(Synth Track), RANDOM when pp = 0,1,2(Rhythm Track)
    *2) reserved when pp = 08(Synth Track)

<4-10>

MIDI Parameter Change table (Rhythm Track Current Step Seq Pattern)

Address (H)	Size (H)	Data (H)	Prameter Name	Description	Default
10 0p 00	1		NOT USED		--
01	1		NOT USED		--
02	1		NOT USED		--
03	1		NOT USED		--
04	1		NOT USED		--
05	1		NOT USED		--
06	1	00...78	Step Seq Inst 1	Ba1C(0)...DgW7(78)	SD10
07	1	00...78	Step Seq Inst 2	Ba1C(0)...DgW7(78)	SD10
08	1	00...78	Step Seq Inst 3	Ba1C(0)...DgW7(78)	SD10
09	1	00...78	Step Seq Inst 4	Ba1C(0)...DgW7(78)	SD10
0A	1	00...78	Step Seq Inst 5	Ba1C(0)...DgW7(78)	SD10
0B	1	00...78	Step Seq Inst 6	Ba1C(0)...DgW7(78)	SD10
0C	1	00...78	Step Seq Inst 7	Ba1C(0)...DgW7(78)	SD10
0D	1	00...78	Step Seq Inst 8	Ba1C(0)...DgW7(78)	SD10
0E	1	00...78	Step Seq Inst 9	Ba1C(0)...DgW7(78)	SD10
0F	1	00...78	Step Seq Inst 10	Ba1C(0)...DgW7(78)	SD10
10	1	00...78	Step Seq Inst 11	Ba1C(0)...DgW7(78)	SD10
11	1	00...78	Step Seq Inst 12	Ba1C(0)...DgW7(78)	SD10
12	1	00...78	Step Seq Inst 13	Ba1C(0)...DgW7(78)	SD10
13	1	00...78	Step Seq Inst 14	Ba1C(0)...DgW7(78)	SD10
14	1	00...78	Step Seq Inst 15	Ba1C(0)...DgW7(78)	SD10
15	1	00...78	Step Seq Inst 16	Ba1C(0)...DgW7(78)	SD10
16	1	00...7F	Step Seq Velocity 1	rest(0),1...127	100(64)
17	1	00...7F	Step Seq Velocity 2	rest(0),1...127	100(64)
18	1	00...7F	Step Seq Velocity 3	rest(0),1...127	100(64)

19	1	00...7F	Step Seq Velocity 4	rest(0),1...127		100(64)
1A	1	00...7F	Step Seq Velocity 5	rest(0),1...127		100(64)
1B	1	00...7F	Step Seq Velocity 6	rest(0),1...127		100(64)
1C	1	00...7F	Step Seq Velocity 7	rest(0),1...127		100(64)
1D	1	00...7F	Step Seq Velocity 8	rest(0),1...127		100(64)
1E	1	00...7F	Step Seq Velocity 9	rest(0),1...127		100(64)
1F	1	00...7F	Step Seq Velocity 10	rest(0),1...127		100(64)
20	1	00...7F	Step Seq Velocity 11	rest(0),1...127		100(64)
21	1	00...7F	Step Seq Velocity 12	rest(0),1...127		100(64)
22	1	00...7F	Step Seq Velocity 13	rest(0),1...127		100(64)
23	1	00...7F	Step Seq Velocity 14	rest(0),1...127		100(64)
24	1	00...7F	Step Seq Velocity 15	rest(0),1...127		100(64)
25	1	00...7F	Step Seq Velocity 16	rest(0),1...127		100(64)
26	1	00...7F	Step Seq Gate Time LSB 1		*1	94%(3C)
27	1	00...7F	Step Seq Gate Time LSB 2		*1	94%(3C)
28	1	00...7F	Step Seq Gate Time LSB 3		*1	94%(3C)
29	1	00...7F	Step Seq Gate Time LSB 4		*1	94%(3C)
2A	1	00...7F	Step Seq Gate Time LSB 5		*1	94%(3C)
2B	1	00...7F	Step Seq Gate Time LSB 6		*1	94%(3C)
2C	1	00...7F	Step Seq Gate Time LSB 7		*1	94%(3C)
2D	1	00...7F	Step Seq Gate Time LSB 8		*1	94%(3C)
2E	1	00...7F	Step Seq Gate Time LSB 9		*1	94%(3C)
2F	1	00...7F	Step Seq Gate Time LSB 10		*1	94%(3C)
30	1	00...7F	Step Seq Gate Time LSB 11		*1	94%(3C)
31	1	00...7F	Step Seq Gate Time LSB 12		*1	94%(3C)
32	1	00...7F	Step Seq Gate Time LSB 13		*1	94%(3C)
33	1	00...7F	Step Seq Gate Time LSB 14		*1	94%(3C)
34	1	00...7F	Step Seq Gate Time LSB 15		*1	94%(3C)
35	1	00...7F	Step Seq Gate Time LSB 16		*1	94%(3C)
36	1	00...7F	Step Seq Pitch 1	0...127		0(00)
37	1	00...7F	Step Seq Pitch 2	0...127		0(00)
38	1	00...7F	Step Seq Pitch 3	0...127		0(00)
39	1	00...7F	Step Seq Pitch 4	0...127		0(00)
3A	1	00...7F	Step Seq Pitch 5	0...127		0(00)
3B	1	00...7F	Step Seq Pitch 6	0...127		0(00)
3C	1	00...7F	Step Seq Pitch 7	0...127		0(00)
3D	1	00...7F	Step Seq Pitch 8	0...127		0(00)
3E	1	00...7F	Step Seq Pitch 9	0...127		0(00)
3F	1	00...7F	Step Seq Pitch10	0...127		0(00)
40	1	00...7F	Step Seq Pitch11	0...127		0(00)
41	1	00...7F	Step Seq Pitch12	0...127		0(00)
42	1	00...7F	Step Seq Pitch13	0...127		0(00)
43	1	00...7F	Step Seq Pitch14	0...127		0(00)
44	1	00...7F	Step Seq Pitch15	0...127		0(00)
45	1	00...7F	Step Seq Pitch16	0...127		0(00)
46	1	00…07	Step Seq Gate Time MSB 1	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
47	1	00…07	Step Seq Gate Time MSB 2	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
48	1	00…07	Step Seq Gate Time MSB 3	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
49	1	00…07	Step Seq Gate Time MSB 4	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
4A	1	00…07	Step Seq Gate Time MSB 5	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
4B	1	00…07	Step Seq Gate Time MSB 6	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
4C	1	00…07	Step Seq Gate Time MSB 7	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
4D	1	00…07	Step Seq Gate Time MSB 8	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
4E	1	00…07	Step Seq Gate Time MSB 9	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
4F	1	00…07	Step Seq Gate Time MSB 10	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
50	1	00…07	Step Seq Gate Time MSB 11	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
51	1	00…07	Step Seq Gate Time MSB 12	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
52	1	00…07	Step Seq Gate Time MSB 13	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
53	1	00…07	Step Seq Gate Time MSB 14	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
54	1	00…07	Step Seq Gate Time MSB 15	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
55	1	00…07	Step Seq Gate Time MSB 16	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
56	1	00…01	Step Seq Mute 1	MuteOFF(0),MuteON(1)		MuteOFF(0)
57	1	00…01	Step Seq Mute 2	MuteOFF(0),MuteON(1)		MuteOFF(0)
58	1	00…01	Step Seq Mute 3	MuteOFF(0),MuteON(1)		MuteOFF(0)
59	1	00…01	Step Seq Mute 4	MuteOFF(0),MuteON(1)		MuteOFF(0)
5A	1	00…01	Step Seq Mute 5	MuteOFF(0),MuteON(1)		MuteOFF(0)
5B	1	00…01	Step Seq Mute 6	MuteOFF(0),MuteON(1)		MuteOFF(0)
5C	1	00…01	Step Seq Mute 7	MuteOFF(0),MuteON(1)		MuteOFF(0)
5D	1	00…01	Step Seq Mute 8	MuteOFF(0),MuteON(1)		MuteOFF(0)
5E	1	00…01	Step Seq Mute 9	MuteOFF(0),MuteON(1)		MuteOFF(0)
5F	1	00…01	Step Seq Mute 10	MuteOFF(0),MuteON(1)		MuteOFF(0)
60	1	00…01	Step Seq Mute 11	MuteOFF(0),MuteON(1)		MuteOFF(0)
61	1	00…01	Step Seq Mute 12	MuteOFF(0),MuteON(1)		MuteOFF(0)
62	1	00…01	Step Seq Mute 13	MuteOFF(0),MuteON(1)		MuteOFF(0)
63	1	00…01	Step Seq Mute 14	MuteOFF(0),MuteON(1)		MuteOFF(0)
64	1	00…01	Step Seq Mute 15	MuteOFF(0),MuteON(1)		MuteOFF(0)
65	1	00…01	Step Seq Mute 16	MuteOFF(0),MuteON(1)		MuteOFF(0)

TOTAL SIZE   66

p = Part Number (0 - 2 : Rhythm Track 1 - 3)

*1 : MSB bit 2-0 -> bit 9-7
   LSB bit 6 -0 -> bit 6-0
*2 : This should be transmitted after sending Step Seq Gate Time LSB n.

\<4-11\>

MIDI Bulk Dump Parameter table (Rhythm Track User Step Seq Pattern)

Address (H)	Size (H)	Data (H)	Prameter Name	Description		Default
2p nn 00	1		NOT USED			--
	1		NOT USED			--
	1		NOT USED			--
	1		NOT USED			--
	1		NOT USED			--
	1		NOT USED			--
	1	00...78	Step Seq Inst 1	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 2	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 3	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 4	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 5	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 6	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 7	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 8	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 9	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 10	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 11	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 12	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 13	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 14	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 15	Ba1C(0)...DgW7(78)		SD10
	1	00...78	Step Seq Inst 16	Ba1C(0)...DgW7(78)		SD10
	1	00...7F	Step Seq Velocity 1	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 2	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 3	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 4	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 5	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 6	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 7	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 8	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 9	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 10	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 11	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 12	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 13	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 14	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 15	rest(0),1...127		100(64)
	1	00...7F	Step Seq Velocity 16	rest(0),1...127		100(64)
	1	00...7F	Step Seq Gate Time LSB 1		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 2		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 3		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 4		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 5		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 6		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 7		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 8		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 9		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 10		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 11		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 12		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 13		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 14		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 15		*1	94%(3C)
	1	00...7F	Step Seq Gate Time LSB 16		*1	94%(3C)
	1	00...7F	Step Seq Pitch 1	0...127		0(00)
	1	00...7F	Step Seq Pitch 2	0...127		0(00)
	1	00...7F	Step Seq Pitch 3	0...127		0(00)
	1	00...7F	Step Seq Pitch 4	0...127		0(00)
	1	00...7F	Step Seq Pitch 5	0...127		0(00)
	1	00...7F	Step Seq Pitch 6	0...127		0(00)
	1	00...7F	Step Seq Pitch 7	0...127		0(00)
	1	00...7F	Step Seq Pitch 8	0...127		0(00)
	1	00...7F	Step Seq Pitch 9	0...127		0(00)
	1	00...7F	Step Seq Pitch10	0...127		0(00)
	1	00...7F	Step Seq Pitch11	0...127		0(00)
	1	00...7F	Step Seq Pitch12	0...127		0(00)
	1	00...7F	Step Seq Pitch13	0...127		0(00)
	1	00...7F	Step Seq Pitch14	0...127		0(00)
	1	00...7F	Step Seq Pitch15	0...127		0(00)
	1	00...7F	Step Seq Pitch16	0...127		0(00)
	1	00...07	Step Seq Gate Time MSB 1	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...07	Step Seq Gate Time MSB 2	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00...07	Step Seq Gate Time MSB 3	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…07	Step Seq Gate Time MSB 4	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…07	Step Seq Gate Time MSB 5	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…07	Step Seq Gate Time MSB 6	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…07	Step Seq Gate Time MSB 7	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…07	Step Seq Gate Time MSB 8	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…07	Step Seq Gate Time MSB 9	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…07	Step Seq Gate Time MSB 10	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…07	Step Seq Gate Time MSB 11	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…07	Step Seq Gate Time MSB 12	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…07	Step Seq Gate Time MSB 13	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…07	Step Seq Gate Time MSB 14	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…07	Step Seq Gate Time MSB 15	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…07	Step Seq Gate Time MSB 16	1%(0)...100%(40)...200%(7F)...1600%(3FF)	*1,2	0
	1	00…01	Step Seq Mute 1	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00…01	Step Seq Mute 2	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00…01	Step Seq Mute 3	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00…01	Step Seq Mute 4	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00…01	Step Seq Mute 5	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00…01	Step Seq Mute 6	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00…01	Step Seq Mute 7	MuteOFF(0),MuteON(1)		MuteOFF(0)
	1	00…01	Step Seq Mute 8	MuteOFF(0),MuteON(1)		MuteOFF(0)

1	00…01	Step Seq Mute 9	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00…01	Step Seq Mute 10	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00…01	Step Seq Mute 11	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00…01	Step Seq Mute 12	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00…01	Step Seq Mute 13	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00…01	Step Seq Mute 14	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00…01	Step Seq Mute 15	MuteOFF(0),MuteON(1)	MuteOFF(0)
1	00…01	Step Seq Mute 16	MuteOFF(0),MuteON(1)	MuteOFF(0)

TOTAL SIZE 66

p = Part Number (0 - 2 : Rhythm Track 1 - 3)
nn = User Pattern Number (0 - 7F)

*1 : MSB bit 2-0 -> bit 9-7
     LSB bit 6 -0 -> bit 6-0
*2 : This should be transmitted after sending Step Seq Gate Time LSB n.

<4-12>

MIDI Parameter Change table (User Song)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default (H)
6s mm 00	2	00 - FF,100-17F, 3FFE, 3FFF	PATTERN NUM	P.001-P.256, U.001-U128,End,----	P.001
02	2	14 - 12C,3FFF	BPM	20.0 - 300.0,----	140.0
04	2	01-C8, FF	PLAY FX GATETIME	01-200, ----	100
06	1	00 - 03, 7F	BEAT	16, 12, 8, ----	16
07	1	32 - 53, 7F	SWING		50
08	1	28 - 58, 7F	PITCH	-24 - 24, ----	0
09	1	00 - 01, 7F	LOOP TYPE	For, bACk, ----	For
0A	1	00-0F, 7F (*1)	TRACK MUTE	oooo-____, ----	oooo

TOTAL SIZE 0B

s = song number
mm = measure (0:1st, 1:2nd… 7f:128th)

<4-13>

Address (H)	Size (H)	Data (H)	Parameter	Description	Default (H)
7s mm 00	2	00 - FF,100-17F, 3FFF	PATTERN NUM	P.001-P.256, U.001-U128,End,----	P.001
02	2	14 - 12C,3FFF	BPM	20.0 - 300.0,----	140.0
04	2	01-C8, FF	PLAY FX GATETIME	01-200, ----	100
06	1	00 - 03, 7F	BEAT	16, 12, 8, ----	16
07	1	32 - 53, 7F	SWING		50
08	1	28 - 58, 7F	PITCH	-24 - 24, ----	0
09	1	00 - 01, 7F	LOOP TYPE	For, bACk, ----	For
0A	1	00-0F, 7F (*1)	TRACK MUTE	oooo-____, ----	oooo

TOTAL SIZE 0B

s = song number
mm = measure (0:129th, 1:130th… 7f:256th)

*1) bit 0: Synth Track, bit1: Rhythm Track 1, bit2:Rhythm Track 2, bit3:Rhythm Track 3,   Track(n) is muted when bit(n) = 1.

143

Function...	Transmitted	Recognized	Remarks
Basic Default Channel Changed	1 - 16 1 - 16	1 - 16 1 - 16	Memorised

Mode   Default
          Messages
          Altered
	3
	x
	**************
		3
		3,4 (m=1) *1
		x	

Note Number : True voice	0 - 127 **************	0 - 127 0 - 127	
Velocity Note ON Note OFF	o 9nH,v=1-127 o 9nH,v=0	o 9nH,v=1-127 x	
After Key's Touch Ch's	x x	x x	
Pitch Bend	x	o 0-24 semi	
0,32 1,5,7,10 11 6,38 Control 64,65 71-75 Change 94 98-99 16,18,19,80-83 100-101	x o x o x o o o o o	o o o o o o o o o o	Bank Select Data Entry Sound Controller Effect Depth NRPN LSB,MSB Knob Control RPN LSB,MSB
Prog Change : True #	o **************	o 0 - 127 0 - 127	
System Exclusive	o	o	
: Song Pos. Common : Song Sel. : Tune	o *3 x x	o *2 x x	
System :Clock Real Time:Commands	o *3 o *3	o *4 o *2	

Aux :All Sound off
     :Reset All Cntrls
     :Local ON/OFF
     :All Notes OFF
Mes- :Active Sense
sages:Reset
	x
	x
	x
	x
	o
	x
		o(120,126,127)
		o(121)
		x
		o(123-125)
		o
		x	

Notes: *1 m is always treated as "1" regardless of its value.
           *2 if MIDI control is in or in/out
           *3 if MIDI control is out or in/out
           *4 if MIDI sync is external			

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

Rhythm Track Instrument List

Note No.	Note		Voice Name	Display	Description
0	C	-2	PulseBass C	bA1C	Filtered square wave synth bass
1	C#	-2	PulseBass C#	b1C°	
2	D	-2	PulseBass D	bA1d	
3	D#	-2	PulseBass D#	b1d°	
4	E	-2	PulseBass E	bA1E	
5	F	-2	PulseBass F	bA1F	
6	F#	-2	PulseBass F#	b1F°	
7	G	-2	PulseBass G	bA1G	
8	G#	-2	PulseBass G#	b1G°	
9	A	-2	PulseBass A	bA1A	
10	A#	-2	PulseBass A#	b1A°	
11	B	-2	PulseBass B	bA1b	
12	C	-1	SineBass C	bA2C	Super low sine wave bass
13	C#	-1	SineBass C#	b2C°	
14	D	-1	SineBass D	bA2d	
15	D#	-1	SineBass D#	b2d°	
16	E	-1	SineBass E	bA2E	
17	F	-1	SineBass F	bA2F	
18	F#	-1	SineBass F#	b2F°	
19	G	-1	SineBass G	bA2G	
20	G#	-1	SineBass G#	b2G°	
21	A	-1	SineBass A	bA2A	
22	A#	-1	SineBass A#	b2A°	
23	B	-1	SineBass B	bA2b	
24	C	0	PickBass C	bA3C	Pick bass
25	C#	0	PickBass C#	b3C°	
26	D	0	PickBass D	bA3d	
27	D#	0	PickBass D#	b3d°	
28	E	0	PickBass E	bA3E	
29	F	0	PickBass F	bA3F	
30	F#	0	PickBass F#	b3F°	
31	G	0	PickBass G	bA3G	
32	G#	0	PickBass G#	b3G°	
33	A	0	PickBass A	bA3A	
34	A#	0	PickBass A#	b3A°	
35	B	0	PickBass B	bA3b	
36	C	1	BD Analog	bd01	080 boom kick
37	C#	1	BD R&B 1	bd02	Dry kick drum
38	D	1	BD R&B 2	bd03	Sliced kick
39	D#	1	BD Lo-Fi	bd04	Loose gated kick
40	E	1	BD Jungle	bd05	Tight gated kick
41	F	1	BD Hip 1	bd06	Thumping kick drum with boosted low end
42	F#	1	BD Hip 2	bd07	Gated kick with harmonic overtones
43	G	1	BD Tech	bd08	Hard electric kick
44	G#	1	BD Dist 1	bd09	Heavily distorted kick
45	A	1	BD Dist 2	bd10	Punchy kick with overdrive
46	A#	1	BD Human 1	bd11	Voice drum "Tuh"
47	B	1	BD Human 2	bd12	Voice drum "Buh"
48	C	2	BD Elec 1	bd13	Trans kick
49	C#	2	BD Elec 2	bd14	090 distorted kick
50	D	2	BD Elec 3	bd15	090 house kick
51	D#	2	SD Live	sd01	Tight snare with slight room reverb
52	E	2	SD R&B 1	sd02	Snare with sharp attack
53	F	2	SD R&B 2	sd03	Snappy hip-hop snare
54	F#	2	SD Analog	sd04	080 analog snare
55	G	2	SD Hip 1	sd05	Loose snare with a gated effect
56	G#	2	SD Hip 2	sd06	Slightly muffled lo-fi snare
57	A	2	SD Hip 3	sd07	Hard smashing gated snare
58	A#	2	SD Cut	sd08	Jungle snare
59	B	2	SD Dodge	sd09	Fast sample hit
60	C	3	SD Timbre	sd10	Industrial hammer-like sound
61	C#	3	SD D&B	sd11	Bright smash snare
62	D	3	SD Dist	sd12	090 distorted snare
63	D#	3	SD Elec 1	sd13	090 house snare
64	E	3	SD Elec 2	sd14	090 tight snare
65	F	3	SD Rim 1	rim1	Heavily struck rim shot
66	F#	3	SD Rim 2	rim2	Lightly struck rim shot
67	G	3	HH D&B Cls	HHC1	Pedal hi-hat
68	G#	3	HH D&B Opn	HHo1	Hi-hat open and closed
69	A	3	HH Ana Cls 1	HHC2	090 tight closed hi-hat
70	A#	3	HH Ana Opn 1	HHo2	080 analog open hi-hat
71	B	3	HH Syn Cls	HHC3	Electric beat box hi-hat (closed)
72	C	4	HH Syn Opn	HHo3	Electric beat box hi-hat (open)
73	C#	4	HH Ana Cls 2	HHC4	090 house hi-hat (closed)
74	D	4	HH Ana Cls 2	HHo4	090 house hi-hat (open)
75	D#	4	Tom Dist	toM1	090 overdriven tom
76	E	4	Tom Ana 1	toM2	80's electro tom
77	F	4	Tom Ana 2	toM3	090 house tom
78	F#	4	Tom Synth	toM4	Resonant synthesizer zap
79	G	4	Tom Sine	toM5	High-pitched synthesized tom
80	G#	4	Crush Cym	CCyM	Loud crash cymbal
81	A	4	Ride Cym	rdC1	Ride cymbal struck on edge
82	A#	4	Ride Bell	rdC2	Ride cymbal struck on bell
83	B	4	Tambourine	tMbr	Palm-struck tambourine
84	C	5	Tabla Open	tbL1	Open tabla
85	C#	5	Tabla Mute	tbL2	Muted tabla
86	D	5	Tabla Nah	tbL3	Nah tabla
87	D#	5	Udu Low	udu1	African Udu drum low
88	E	5	Udu High	udu2	African Udu drum high
89	F	5	Udu Finger	udu3	African Udu finger
90	F#	5	Clave	CLAC	080 claves
91	G	5	Maracas	MrCS	Latin maracas
92	G#	5	Shaker	SHHr	Samba shaker
93	A	5	Clap	CLAP	090 house clap
94	A#	5	Scratch 1	SCr1	Forward record scratch
95	B	5	Scratch 2	SCr2	Backward record scratch
96	C	6	Scratch 3	SCr3	Record scratch back and forth 1
97	C#	6	Scratch 4	SCr4	Record scratch back and forth 2
98	D	6	Ripper	rPPr	Over-blown mic distortion
99	D#	6	Zap 1	2AP1	Scratchy synth zap
100	E	6	Zap 2	2AP2	Hi-res laser zap
101	F	6	Rev Low	rELU	Eerie reverse reverb effect
102	F#	6	Synth Vibra	Syb	Fluttering whistle-like noise
103	G	6	Metal	MEtL	Percussive metallic sound
104	G#	6	Click	CLCH	Squishy percussive noise
105	A	6	Gt Attack	GtAt	Electric guitar with wah effect
106	A#	6	Gt Power	GtPU	Sustaining distorted guitar chord
107	B	7	Stab Organ	Stor	Synth chord stab
108	C	7	SlowBass	bA4	Drone bass slow attack
109	C#	7	FingerBass	bA5	Drone bass fast attack
110	D	7	SynthBass 1	sb51	030 saw wave (closed filter)
111	D#	7	SynthBass 2	sb52	030 saw wave (half-open filter)
112	E	7	SynthBass 3	sb53	030 saw wave (open filter)
113	F	7	SynthBass 4	sb54	030 saw wave (high resonance)
114	F#	7	Digi Wave 1	dGU1	Falling synth note modulated with LFO
115	G	7	Digi Wave 2	dGU2	Sitar-like sound with long filter decay
116	G#	7	Digi Wave 3	dGU3	Sitar-like sound with vibrato
117	A	7	Digi Wave 4	dGU4	High-pitched UFO (looped)
118	A#	7	Digi Wave 5	dGU5	Synth note with a quick rise in pitch
119	B	7	Digi Wave 6	dGU6	Bell sound with a slight drop in pitch
120	C	8	Digi Wave 7	dGU7	Metal can struck with mallet

145

Preset Bank 1 (Bank MSB=63, LSB=0, Pgm#1-64)

No.	Pgm#	Pattern Name	Group	BPM
P001	1	Nosebleed		143
P002	2	KlingKlang		135
P003	3	Swimming		135
P004	4	Ethnectric		136
P005	5	Percussive		140
P006	6	Skirmish		138
P007	7	Still DX		145
P008	8	Stomper		140
P009	9	Wreath		145
P010	10	Subculture		138
P011	11	Ni-Chi-Bu		138
P012	12	KAGERO		130
P013	13	Warp		132
P014	14	Energie		136
P015	15	Clokker		123
P016	16	GB Trance		142
P017	17	Hypnotic		165
P018	18	RaggaGabba		174
P019	19	Nose Dive		143
P020	20	Sink		140
P021	21	Logi Drum	techno	138
P022	22	Bombay		137
P023	23	Oaz		135
P024	24	BrasilDrum		133
P025	25	Asiara		139
P026	26	Acid Pulse		130
P027	27	Elec Pulse		128
P028	28	Dredzs		128
P029	29	Elec Rezz		127
P030	30	Night Life		121
P031	31	Orbo Fuzz		120
P032	32	Big Up		137
P033	33	Drenched		146
P034	34	TunaMooger		135
P035	35	Digi Touch		135
P036	36	Floaty		135
P037	37	Cyanine		138
P038	38	Pingpong		131
P039	39	Mini Jim		75
P040	40	Distcore		166
P041	41	Hardcore		283
P042	42	HouseParty		140
P043	43	Ibiza		134
P044	44	Sand		134
P045	45	ChimeNoise		130
P046	46	Deep Beat		135
P047	47	Full House		131
P048	48	E-Salsa		113
P049	49	Scream		127
P050	50	FJA		129
P051	51	Minimal At		138
P052	52	Voodoo Key		131
P053	53	Oskylaytor	house	136
P054	54	Stupid		128
P055	55	Solo Bass		128
P056	56	Saw FB		128
P057	57	Badass		145
P058	58	Quid		140
P059	59	Reeper		137
P060	60	Scratches		130
P061	61	Fuzz Line		130
P062	62	House Dog		130
P063	63	FreeGroove		140
P064	64	Life Line		129

Preset Bank 1 (Bank MSB=63, LSB=0, Pgm#65-128)

No.	Pgm#	Pattern Name	Group	BPM
P65	65	Building		131
P66	66	Calcutta		133
P67	67	SolidHouse	house	124
P68	68	Nu House		130
P69	69	Plastix		128
P70	70	Aquafer		134
P71	71	Rezz Buzz		132
P72	72	Tech Mini		142
P73	73	DX Scratch		122
P74	74	WV 2001		110
P75	75	Warning		116
P76	76	Distone		138
P77	77	Electrics		128
P78	78	Freaky		122
P79	79	Lo Go	breaks 1	135
P80	80	Q-Baz		124
P81	81	Barbarossa		108
P82	82	Up Link		115
P83	83	Dyammaka		137
P84	84	Double One		131
P85	85	Koo-KAI		144
P86	86	Snow		145
P87	87	Dasboot		140
P88	88	Run!		158
P89	89	Siva		120
P90	90	Syn Bell		70
P91	91	DJ DX		135
P92	92	Reeberfed		141
P93	93	Psy Trance		135
P94	94	Mini Pit		138
P95	95	Psy Mini		143
P96	96	Plazma		138
P97	97	Rave Synth		137
P98	98	Psy Seq		143
P99	99	TEKKEN		142
P100	100	Buh!		138
P101	101	Tokyo		143
P102	102	Bass Pad		133
P103	103	Wave		137
P104	104	Runaway		145
P105	105	Screak		132
P106	106	Two Three		142
P107	107	Straight		132
P108	108	Klic Klac	trance	140
P109	109	Ana Pluck		138
P110	110	Fun Disc		130
P111	111	Puppet		140
P112	112	Comp Pluck		130
P113	113	Fluid		135
P114	114	Dawning		136
P115	115	Nickel		78
P116	116	Ambisonics		145
P117	117	SpaceTribe		120
P118	118	Wire SP		120
P119	119	Precinct		146
P120	120	U boat		139
P121	121	Fuzzy Sun		142
P122	122	Tune Tek		132
P123	123	DCS		149
P124	124	Napalm		142
P125	125	Paradise		155
P126	126	Cedar		123
P127	127	Dino		140
P128	128	Hortin		131

Preset Bank 2 (Bank MSB=63, LSB=1, Pgm#1-64)

No.	Pgm#	Pattern Name	Group	BPM
P129	1	Spacy Keys		88
P130	2	Deep Sea		89
P131	3	Jam		92
P132	4	Bluntz		99
P133	5	Getaway		98
P134	6	Angel City	hiphop	98
P135	7	Sixteen		106
P136	8	GTA		98
P137	9	Seismic		101
P138	10	Lap Dance		90
P139	11	Hazard		100
P140	12	Phonk E5		102
P141	13	SugarDaddy		97
P142	14	Modem Beat		95
P143	15	Liger		96
P144	16	R-B		100
P145	17	Minstrels		97
P146	18	Apus		96
P147	19	Saeidi		88
P148	20	Hip Fusion		100
P149	21	TrendyVibe		100
P150	22	Stop Go	triphop	112
P151	23	Hip Q		98
P152	24	Mrmb Tech		96
P153	25	Minor		90
P154	26	Melody Man		94
P155	27	Two Break		116
P156	28	Aquila		84
P157	29	Pavo		63
P158	30	Infrared		170
P159	31	Groover		170
P160	32	Moa		172
P161	33	Fuzzy Moon		170
P162	34	Discordant		160
P163	35	Clanker		165
P164	36	Prelude		165
P165	37	Wicked		172
P166	38	Sameagle		170
P167	39	Acidic		166
P168	40	Feel Noise		170
P169	41	Over DNB	drum'n bass	172
P170	42	Ruffle		165
P171	43	Lyla		170
P172	44	Antlia		129
P173	45	Volans		132
P174	46	Crux		122
P175	47	Scorpius		88
P176	48	Caelum		88
P177	49	Tribez		140
P178	50	Bossa Call		88
P179	51	Dirt Box		165
P180	52	Delhi		108
P181	53	Bang Tech		123
P182	54	Highway		132
P183	55	Spacecraft		106
P184	56	Hyp Fuzz		95
P185	57	FunkyFingr		94
P186	58	HPF Metal	breaks 2	96
P187	59	Software		128
P188	60	Shin-Wa		131
P189	61	Stepping		131
P190	62	Dada Fly		133
P191	63	FlyingRoad		96
P192	64	Deep Grey		135

Preset Bank 2 (Bank MSB=63, LSB=1, Pgm#65-128)

No.	Pgm#	Pattern Name	Group	BPM
P193	65	Driver		132
P194	66	Big Punch		123
P195	67	Big Step		132
P196	68	BreakDance		131
P197	69	Port Fuzz		128
P198	70	Syn Pick		130
P199	71	Body		95
P200	72	Ge Ge Ge		95
P201	73	Hip Pick		120
P202	74	Retro Jam		126
P203	75	Funk Hop		112
P204	76	Basic Bass		98
P205	77	Tomic Bass		114
P206	78	Data Bass		106
P207	79	Claviphunk		112
P208	80	Hexadron		106
P209	81	Bunglemon		91
P210	82	Stabber		110
P211	83	Tribe Vibe		100
P212	84	New York		119
P213	85	Puffy Wind	breaks 2	135
P214	86	Clouds		138
P215	87	Sqotesue		111
P216	88	Reflex		145
P217	89	Ambernecta		130
P218	90	Devastated		90
P219	91	Reborn		97
P220	92	Aquarium		97
P221	93	Breathing		119
P222	94	WorkGarage		140
P223	95	Frettin		64
P224	96	Artoo		133
P225	97	Cowbelly		131
P226	98	Electro FX		105
P227	99	FX Track		105
P228	100	Guillemot		92
P229	101	Ruler		122
P230	102	Impetus		113
P231	103	Fritenite		106
P232	104	Octans		64
P233	105	Bossa		95
P234	106	New Delhi		86
P235	107	Vela		49
P236	108	Tock		42
P237	109	Jixtuken		50
P238	110	Blue		105
P239	111	Reflection		95
P240	112	Turmoil		80
P241	113	ZOOM		89
P242	114	Diazepam		145
P243	115	Dubby		105
P244	116	Effect		131
P245	117	Boom FX	ambient	105
P246	118	Bass Face		60
P247	119	Darker T		48
P248	120	Mach Man		35
P249	121	Flicker		49
P250	122	Flash Back		20
P251	123	Reticulum		82
P252	124	Sagitta		86
P253	125	Perseus		84
P254	126	Auriga		55
P255	127	Libra		88
P256	128	Grus		39

User Bank (Bank MSB=63, LSB=2, Pgm#1-64)

No.	Pre.#	Pattern Name	Group	BPM
U001	93	Psy Trance	trance	135
U002	42	HouseParty	house	140
U003	22	Bombay	techno	137
U004	207	Claviphunk	breaks 2	112
U005	83	Dyammaka	breaks 1	137
U006	112	Comp Pluck	trance	130
U007	178	Bossa Call	drum'n bass	88
U008	205	Tomic Bass	breaks 2	114
U009	67	SolidHouse	house	124
U010	5	Percussive	techno	140
U011	183	Spacecraft	breaks 2	106
U012	236	Tock	ambient	42
U013	27	Elec Pulse	techno	128
U014	127	Dino	trance	140
U015	181	Bang Tech	breaks 2	123
U016	129	Spacy Keys	hiphop	88
U017	4	Ethnectric	techno	136
U018	60	Scratches	house	130
U019	193	Driver	breaks 2	132
U020	246	Bass Face	ambient	60
U021	29	Elec Rezz	techno	127
U022	106	Two Three	trance	142
U023	165	Wicked	drum'n bass	172
U024	198	Syn Pick	breaks 2	130
U025	1	Nosebleed	techno	143
U026	65	Building	house	131
U027	180	Delhi	breaks 2	108
U028	131	Jam	hiphop	92
U029	75	Warning	breaks 1	116
U030	111	Puppet	trance	140
U031	220	Aquarium	breaks 2	97
U032	256	Grus	ambient	39
U033	36	Floaty	techno	135
U034	64	Life Line	house	129
U035	98	Psy Seq	trance	143
U036	214	Clouds	breaks 2	138
U037	38	Pingpong	techno	131
U038	81	Barbarossa	breaks 1	108
U039	171	Lyla	drum'n bass	170
U040	134	Angel City	hiphop	98
U041	66	Calcutta	house	133
U042	91	DJ DX	trance	135
U043	223	Frettin	breaks 2	64
U044	248	Mach Man	ambient	35
U045	2	KlingKlang	techno	135
U046	101	Tokyo	trance	143
U047	187	Software	breaks 2	128
U048	146	Apus	triphop	96
U049	72	Tech Mini	breaks 1	142
U050	44	Sand	house	134
U051	208	Hexadron	breaks 2	106
U052	238	Blue	ambient	105
U053	28	Dredzs	techno	128
U054	115	Nickel	trance	78
U055	222	WorkGarage	breaks 2	140
U056	69	Plastix	house	128
U057	190	Dada Fly	breaks 2	133
U058	14	Energie	techno	136
U059	170	Ruffle	drum'n bass	165
U060	234	New Delhi	breaks 2	86
U061	78	Freaky	breaks 1	122
U062	120	U boat	trance	139
U063	217	Ambernecta	breaks 2	130
U064	250	Flash Back	ambient	20

User Bank (Bank MSB=63, LSB=2, Pgm#65-128)

No.	Pre.#	Pattern Name	Group	BPM
U065	32	Big Up	techno	137
U066	104	Runaway	trance	145
U067	233	Bossa	breaks 2	95
U068	145	Minstrels	triphop	97
U069	20	Sink	techno	140
U070	73	DX Scratch	breaks 1	122
U071	168	Feel Noise	drum'n bass	170
U072	184	Hyp Fuzz	breaks 2	95
U073	46	Deep Beat	house	135
U074	107	Straight	trance	132
U075	229	Ruler	breaks 2	122
U076	94	Mini Pit	trance	138
U077	3	Swimming	techno	135
U078	119	Precinct	trance	146
U079	204	Basic Bass	breaks 2	98
U080	142	Modem Beat	triphop	95
U081	85	Koo-KAI	breaks 1	144
U082	70	Aquafer	house	134
U083	212	New York	breaks 2	119
U084	26	Acid Pulse	techno	130
U085	80	Q-Baz	breaks 1	124
U086	121	Fuzzy Sun	trance	142
U087	158	Infrared	drum'n bass	170
U088	192	Deep Grey	breaks 2	135
U089	50	FJA	house	129
U090	139	Hazard	hiphop	100
U091	7	Still DX	techno	145
U092	230	Impetus	breaks 2	113
U093	84	Double One	breaks 1	131
U094	105	Screak	trance	132
U095	202	Retro Jam	breaks 2	126
U096	235	Vela	ambient	49
U097	17	Hypnotic	techno	165
U098	123	DCS	trance	149
U099	215	Sqotesue	breaks 2	111
U100	154	Melody Man	triphop	94
U101	9	Wreath	techno	145
U102	77	Electrics	breaks 1	128
U103	169	Over DNB	drum'n bass	172
U104	191	FlyingRoad	breaks 2	96
U105	47	Full House	house	131
U106	189	Stepping	breaks 2	131
U107	114	Dawning	trance	136
U108	218	Devastated	breaks 2	90
U109	15	Clokker	techno	123
U110	118	Wire SP	trance	120
U111	221	Breathing	breaks 2	119
U112	143	Liger	triphop	96
U113	199	Body	breaks 2	95
U114	51	Minimal At	house	138
U115	87	Dasboot	breaks 1	140
U116	216	Reflex	breaks 2	145
U117	10	Subculture	techno	138
U118	100	Buh!	trance	138
U119	159	Groover	drum'n bass	170
U120	232	Octans	breaks 2	64
U121	23	Oaz	techno	135
U122	49	Scream	house	127
U123	237	Jixtuken	ambient	50
U124	224	Artoo	breaks 2	133
U125	242	Diazepam	ambient	145
U126	252	Sagitta	ambient	86
U127	245	Boom FX	ambient	105
U128	239	Reflection	ambient	95

Song 1 : Demo 1 (techno)   Song 4 : Demo 4 (house)
Song 2 : Demo 2 (drum'n bass) Song 5 : Demo 5 (techno)
Song 3 : Demo 3 (triphop)   Song 6 : Demo 6 (trance)

DX200:U123,U124 & SU200:BANK A (Trip Hop Demo)
DX200:U125,U126 & SU200:BANK B (Trance Demo)
DX200:U127,U128 & SU200:BANK C (Break Beats Demo)

DX200:U123,U124 & AN200:U123,U124 (Trip Hop Demo)
DX200:U125,U126 & AN200:U125,U126 (Trance Demo)
DX200:U127,U128 & AN200:U127,U128 (Break Beats Demo)