KORG

WAVEDRUM

Dynamic Percussion Synthesizer

Synthétiseur Dynamique de Percussion

Owner´s Manual

SONDIUS-XG

Ⓔ ②

Thank you for purchasing the Korg WAVEDRUM dynamic percussion synthesizer.

This owner's manual contains a great deal of information that will help you understand the WAVEDRUM and play it to its fullest potential. In order- to ensure that you are taking complete advantage of your WAVEDRUM, please read this manual carefully and use the product as directed.

Precautions

Location

Using the unit in the following locations can result in a malfunction.

- In direct sunlight
- Locations of extreme temperature or humidity
- Excessively dusty or dirty locations
- Locations of excessive vibration
- Close to magnetic fields

Power supply

Please connect the designated AC adapter to an AC outlet of the correct voltage. Do not connect it to an AC outlet of voltage other than that for which your unit is intended.

Interference with other electrical devices

Radios and televisions placed nearby may experience reception interference. Operate this unit at a suitable distance from radios and televisions.

Handling

To avoid breakage, do not apply excessive force to the switches or controls.

Care

If the exterior becomes dirty, wipe it with a clean, dry cloth. Do not use liquid cleaners such as benzene or thinner, or cleaning compounds or flammable polishes.

Keep this manual

After reading this manual, please keep it for later reference.

Keeping foreign matter out of your equipment

Never set any container with liquid in it near this equipment. If liquid gets into the equipment, it could cause a breakdown, fire, or electrical shock.

Be careful not to let metal objects get into the equipment. If something does slip into the equipment, unplug the AC adapter from the wall outlet. Then contact your nearest Korg dealer or the store where the equipment was purchased.

THE FCC REGULATION WARNING (for USA)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Unauthorized changes or modification to this system can void the user's authority to operate this equipment.

Notice regarding disposal (EU only)

When this "crossed-out wheeled bin" symbol is displayed on the product, owner's manual, battery, or battery package, it signifies that when you wish to dispose of this product, manual, package or battery you must do so in an approved manner. Do not discard this product, manual, package or battery along with ordinary household waste. Disposing in the correct manner will prevent harm to human health and potential damage to the environment. Since the correct method of disposal will depend on the applicable laws and regulations in your locality, please contact your local administrative body for details. If the battery contains heavy metals in excess of the regulated amount, a chemical symbol is displayed below the "crossed-out wheeled bin" symbol on the battery or battery package.

Cautions for use

Each individual WAVEDRUM unit will differ slightly depending on the type of head used, how it is tuned or played, and how it has been maintained. Please take note of the following points as well as the preceding “Cautions for safety.”

Do not place heavy objects on the head for long periods

If pressure is applied to the surface of the head for a long period, the rubber cushion and sensor under the head will become deformed, and this can harm the playability of the instrument.

Avoid placing heavy objects on the head or placing the WAVEDRUM upside down for long periods.

Feedback

The sensors in the WAVEDRUM detect the vibrations that occur in the head and body when you strike the WAVEDRUM with your hand or a drum stick. In some situations, the WAVEDRUM may also act as a microphone and pick up loud sounds from nearby high output speakers in addition to vibrations produced by directly striking the WAVEDRUM.

Especially when monitoring the WAVEDRUM with a large PA setup, the WAVEDRUM sounds emitted by the speakers can be transmitted through the floor or stand (or directly through the air) and be picked up once again by the WAVEDRUM.

When such vibrations are detected by the WAVEDRUM and sent back through the speakers, feedback will occur, and an uncontrollable and continuous sound will result. Feedback places severe stress on amps and speakers, and can cause serious damage to equipment. Thus, when a powerful monitoring system is used, the equalizers and limiters of the PA system should be adjusted to prevent the WAVEDRUM from producing feedback, similar to preventing feedback for vocal and acoustic instrument mics.

Data handling

Unexpected malfunctions can result in the loss of memory contents. Korg cannot accept any responsibility for any loss or damage which you may incur as a result of data loss.

*This product was developed under license of physical modeling tone generator patents (http://www.sondius-xg.com) owned by Stanford University USA and Yamaha Corporation.

*All product names and company names are the trademarks or registered trademarks of their respective owners.

Contents

Introduction

Main features

Revolutionary synthesis technology

The WAVEDRUM generates sound by detecting the sound of your strike via the head and rim sensors, and processing this audio source by DSP (Digital Signal Processing) sound synthesis technology to create unique sounds. At the same time, a PCM sound source is also played using your strike as the trigger.
Using this combination of methods, the WAVEDRUM produces a rich variety of percussion sounds that give you an extremely wide range of freedom for performance expression. By using subtle motions of your fingers or hand to strike, rub, or scratch the WAVEDRUM, or by playing it using sticks, mallets, or brushes, you can obtain a high degree of expressive and dynamic range that rivals that of acoustic drums or percussion instruments.

Unique sounds generated by 36 different algorithms

The WAVEDRUM uses DSP technology to carry out a variety of software synthesis methods including analog, additive, non-linear, and physical modeling, and combines these sounds to create the final output sound. Such combinations are called “algorithms,” and the WAVEDRUM contains 36 different single-size and double-size algorithms. By specifying different algorithms you can create completely new sounds that can be produced only by the WAVEDRUM, as well as a variety of instrumental sounds or sounds of nature.

200 different PCM instruments for head and rim

The PCM instruments (PCM sound sources produce a rich variety of sounds in addition to the algorithms. Programs that use a single-size algorithm allow you to freely assign a different algorithm and PCM instrument to the head and the rim, giving you a very broad array of sounds. Programs that use a double-size algorithm are optimized for simulating acoustic instruments such as a snare, djembe, or cajon; within the algorithm, these programs analyze your performance in realtime, and based on this analysis control the PCM instrument to create natural response that cannot be obtained from a conventional PCM sound generator.

100 preset programs, 100 user programs

There are 100 built-in preset programs that combine percussion, drums, and sound effects in complex ways that can produce completely different sounds according to your playing technique. Programs that you edit can be saved in the 100 user programs.

Live mode

You can register twelve frequently-used programs (four programs x three banks) in buttons 1–4 for immediate recall. This is convenient for live performances.

100 loop phrases

The built-in 100 loop phrases cover a broad range of genres and tempos, allowing you to play along for a one-person jam session.

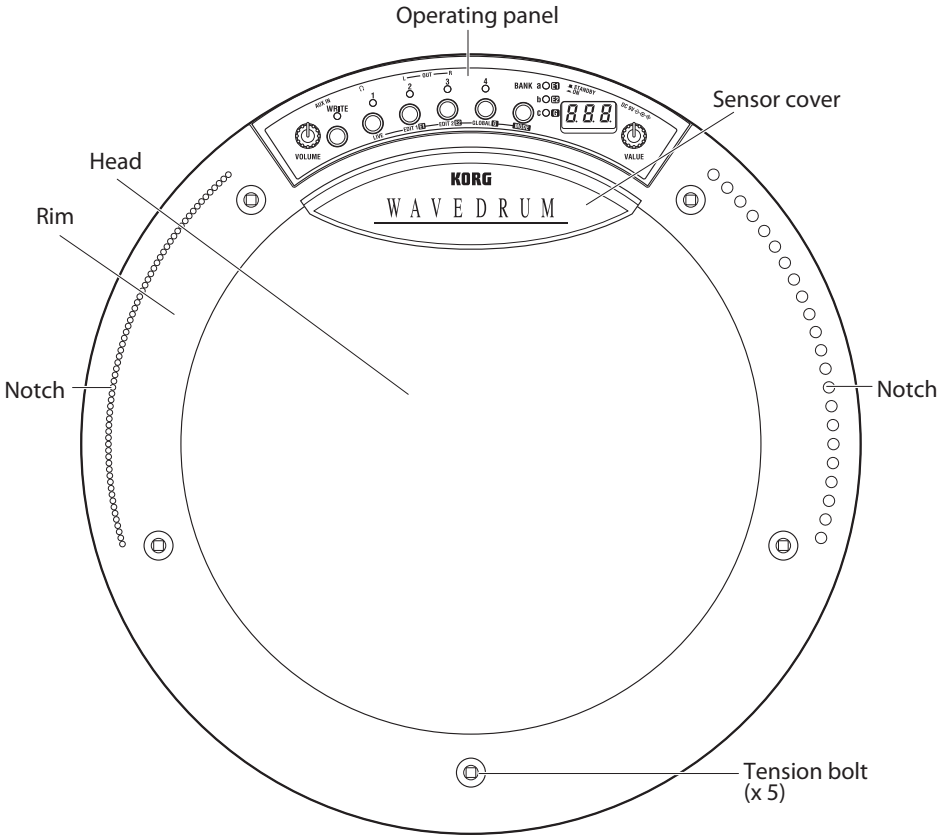
AUX IN connector

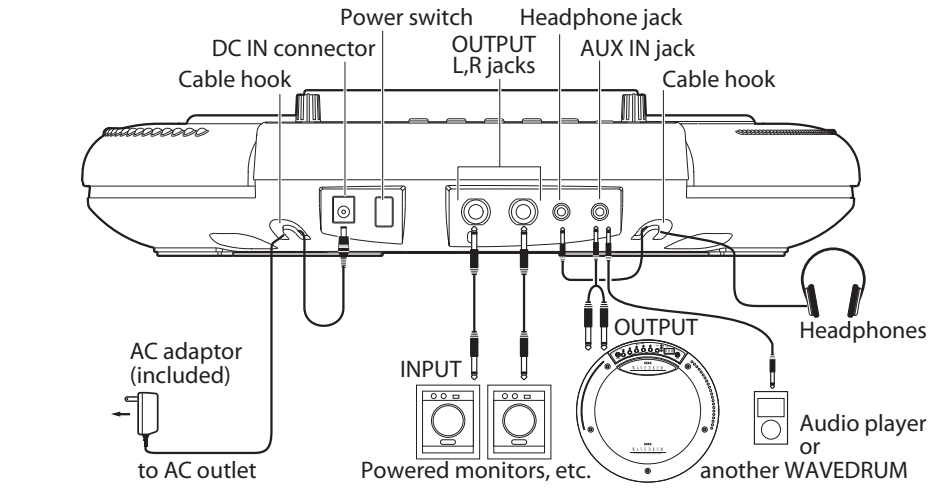
The AUX IN connector lets you connect another WAVEDRUM unit, an audio device, or an external sound module, and play along with that audio source.

Lightweight and compact design

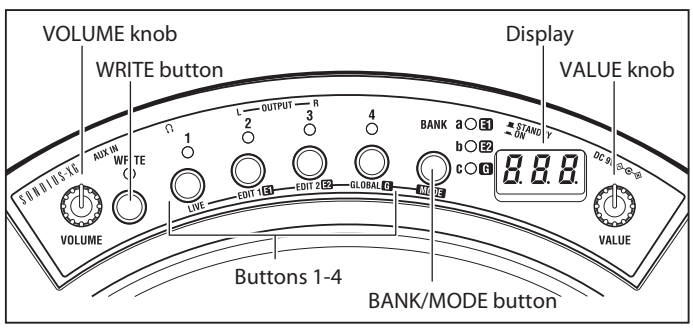
The WAVEDRUM features a lightweight and compact design for comfortable playing on your lap as well as easy portability. You can also perform with it attached to a stand (sold separately) for stand-up performance (Percussion Stand ST-WD) or a commercially-available snare stand.

Parts of the WAVEDRUM





Operating panel



Preparations

Connecting audio devices

Before you make connections to other equipment, you must turn down the volume of all equipment and turn off the power. Careless operation may damage your speaker system or cause malfunctions.

Please refer to the preceding page for a diagram of connections.

Connecting the output jacks to powered monitors or a mixer

- Connect the WAVEDRUM's OUTPUT L, R jacks to the input jacks of your powered monitors or mixer.

  If you're monitoring through headphones, connect your headphones to the WAVEDRUM's headphone jack. The VOLUME knob adjusts the L & R OUTPUT as well as the headphone volume.

Connecting an audio device to the input jack

- You can connect the OUTPUT L, R jacks of a second WAVEDRUM unit or the output jacks of other audio devices or to the WAVEDRUM's AUX IN jack. The sound that is input via this jack will be output from the OUTPUT L, R jacks and the headphone jack.

  note: To input sound from a device connected to the AUX IN jack, you must go to Global mode and raise the AUX IN jack mix level appropriately. The mix level is 0 by default (*See page 15*).

Turning the power on

Connecting the AC adapter

1. **Make sure that the WAVEDRUM's power switch is turned off (not pressed inward).**
2. **Connect the included AC adapter to the WAVEDRUM's rear panel DC IN jack.**

   Use only the included AC adapter. Using any other AC adapter may cause malfunctions.
3. **Plug the AC adapter into an AC outlet.**

   Be sure to use an AC outlet that is the correct voltage for the adapter.
4. **To prevent the plug from being accidentally disconnected, secure the power cable by wrapping it around the WAVEDRUM's cable hook.**

Turning the power on

1. **Make sure that the WAVEDRUM and any connected equipment is powered off, and that all volume controls are set to 0.**
2. **Power-on the equipment that's connected to the AUX IN jack.**
3. **Press the WAVEDRUM's power switch to turn it on.**

   When powering-on the WAVEDRUM, do not rest your hand or any other object on the head. The WAVEDRUM may malfunction if this is the case.
4. **Turn on your powered monitors or other equipment connected to the OUTPUT L, R jacks.**
5. **Adjust the volume of each device. Adjust the WAVEDRUM's volume by turning its VOLUME knob. If you're using the AUX IN jack, use the mix level setting to adjust its volume** (*See page 15*)**.**

   Sudden high volumes produced by the WAVEDRUM can damage your monitor equipment, or your hearing if you're monitoring through headphones. Please be sure to set the volume appropriately.

Turning the power off

When you've completed any necessary steps such as saving a program that you were editing, turn off the power by following the procedure below (*See page 9*).

Never turn off the power while data is being saved. Internal data may be destroyed if you do so.

1. **Minimize the volume and then power off your powered monitors or other equipment that is connected to the OUTPUT L, R jacks.**
2. **Turn the WAVEDRUM's VOLUME knob all the way to the left, and then press the power switch to turn off the power.**
3. **Power off the power to any equipment connected to the AUX IN jack.**

Attaching the WAVEDRUM to a stand

The WAVEDRUM can be used with any commercially-available 14-inch three-arm snare stand.

If you want to play the WAVEDRUM in a standing position, like a conga, you can use the optional Percussion Stand ST-WD (sold separately).

Place the stand on a flat and stable location. Bundle the power adapter and all connection cables neatly so that no one trips over them.

For details on attaching the WAVEDRUM to your stand, carefully read the owner's manual included with the stand that and as described.

Performing

Performance techniques

The sound of the WAVEDRUM will respond to the subtle nuances in the way that you strike, rub, or scratch it with your fingers or hand, or the way that you strike it with a stick, mallet, or brush. It will also respond differently depending on whether you strike the center of the head, the edge, or the rim. The WAVEDRUM produces expressive and dynamic range that rivals that of an acoustic drum or percussion instrument, covering the full spectrum of performance gestures from a light brush across the head to a hard rimshot.

Some of the programs simulate conventional percussion instruments, while others produce a different pitch each time you strike; some allow you to play a phrase in a specified scale. You can use a variety of techniques; after striking the surface of the head with your hand or mallet, you can apply additional pressure to control the pitch or tone of the decay, or you can produce sustaining sounds simply by applying pressure without striking the drum.

For details on each program, refer to the separate leaflet "Voice Name List" and to *page 16* and following of this manual.

Do not strike below the sensor cover or on the operating panel area.

Selecting programs

1. **Hold down the BANK/MODE button and press button 1.**

   This selects Live mode, which is the mode you'll use when playing the WAVEDRUM. The display will indicate `LIU`, and will then indicate the program number (`00`–`99`, `P00`–`P99`).

   note: Immediately after you turn on the power, the program stored in button 1 of bank a will be selected.

2. **Press the BANK/MODE button to switch banks.**

   Each time you press the button, you'll switch banks in the order of a→b→c→a... The indicators at the right of the button will light consecutively. The display will indicate the bank name, or will indicate the program number for the bank of the program that is currently selected.

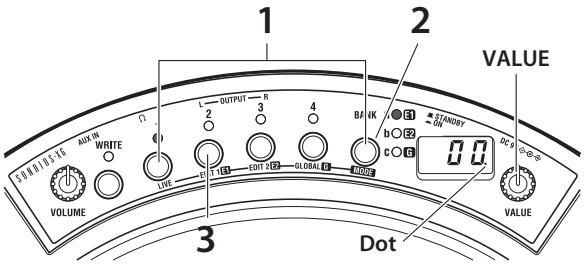
3. **Press a button 1–4 to select the program that you want to play.**

   The indicator above the selected button will light up, and the display will indicate the program number.

   Strike the head or rim to hear the selected program.

4. **If you want to select a program from a different bank, repeat steps 2 and 3 to select the desired program.**

note: The WAVEDRUM contains loop phrases, such as drum phrases. You can play along with these loop phrases (*See page 15*).



Playing all programs consecutively

- When the display shows the program number, turning the VALUE knob will switch through the programs consecutively (`00`–`99`, `P00`–`P99`).

  If a program number has been changed, the decimal point to the right of the program number in the display will light up. If you want to return to the original program that was assigned, press the button whose indicator is lit.

About the programs

The WAVEDRUM contains one hundred user programs (`00`–`99`) and one hundred preset programs (`P00`–`P99`). User programs, on the other hand, can be used to save a program that you've edited. You cannot rewrite preset programs. By default the user programs contain the same programs as the preset programs.

Assigning programs to buttons 1–4

You can assign your favorite programs to buttons 1–4 assignable locations. You can assign a total of 12 programs (1–4 for banks a, b and c) for quick access.

1. **Select the bank and button that you want to assign.**

   As an example, here's how to assign bank a button 1. Press the BANK/MODE button to select bank a, and then press button 1.

2. **Turn the VALUE knob to select the program that you want to assign.**

3. **Press the WRITE button. The indicator above the button will blink, and the display will blink to indicate the newly assigned bank and button number `a-1` and the program number.**

4. **Press the WRITE button once again to complete the assignment.**

   If you decide not to assign the program, press any button other than the WRITE button.

Editing

By editing a program you can adjust it to suit your playing style, or transform it into a completely new sound. For example, you can adjust the pitch or the decay time to match your song or your playing method, or you can select the way that different strikes will affect the volume or tone. You can also adjust reverb and delay effects.

By adjusting the algorithm parameters you can make more detailed changes to the sound or even transform the sound radically. For example, even with the same algorithm, it's possible to create a range of variation not possible with a typical percussion instrument, such as changing the head of a drum from skin to metal.
You can also switch the algorithm itself or choose a different PCM instrument, and create sounds from scratch.

The process of making these changes is called "editing." On the WAVEDRUM, you can edit using the Edit modes described below.

Basic editing procedure

note: In order to edit a program, you must first select the program that you want to edit in Live mode (*See page 7*).

1. **Select the desired Edit mode.**

Edit 1: Hold down the BANK/MODE button and press button 2. The display will indicate Ed1 for several seconds.

In Edit 1 mode you can adjust parameters such as Tune, Decay, Level, Curve, and Effect (reverb, delay), and select the algorithm and PCM instrument (*See page 12*).

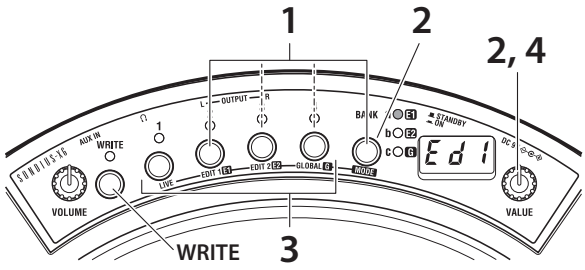
Edit 2: Hold down the BANK/MODE button and press button 3. The display will indicate Ed2 for several seconds.

In Edit 2 mode you can adjust the algorithm (*See page 14*).

Global: Hold down the BANK/MODE button and press button 4. The display will indicate GLb for several seconds.

In Global mode you can adjust the final panning, play back looped phrases, and adjust the WAVEDRUM's calibration (*See page 15*).

note: In Edit 1 and 2 modes you'll be editing the sound of an individual program. In contrast, the settings in Global mode are common to the entire WAVEDRUM; they are not specific to an individual program.



For details on each mode, please refer to the respective reference pages.

The [E1], [E2], or [G] indicator at the right of the BANK/MODE button will blink.

If you select Edit mode 1 or 2, the display will indicate Ed1 or Ed2, and will then indicate the current page.

In Global mode, the display will indicate GLb, and will then indicate the parameter that was last selected. (The unit will be in this state following step 3. Immediately after you turn on the power, Pan will be selected.)

2. **Select the page that you want to edit. Press the BANK/MODE button. Press the button until the desired page appears. Alternatively, you can turn the VALUE knob to select a page.**

For example if you press the BANK/MODE button in Edit 1 mode, the page will change in the order of Tune (tun) → Decay (dcy) → Level (LEU) → ... (*See page 12*).

3. **Press one of the buttons 1–4 to select the parameter that you want to edit.**

The indicator above the button will light up. The display will indicate the parameter name, and then the value.

note: If a button other than the selected button (1–4) is blinking, this indicates that the corresponding parameter value has been edited.

4. **Turn the VALUE knob to edit the value.**

The value indicated in the display will change, and the decimal point to the right of the value will light up. (The decimal point will go dark if you return the value to its original setting.)

5. **If you want to edit a parameter located on another page, press the BANK/MODE button to switch pages (see step 2). Then edit the value as described in steps 3 and 4.**

6. **If you want to keep the changes that you've made, you must save them. Please see next page.**

note: If you return to Live mode without saving the program that you've edited, the indicator of the selected button (1–4) will blink, and the decimal point at the right edge of the display will light up. This indicates that the program has not been saved.

Saving your edited settings

If you would like to use your edited program again later, you'll need to save it. If you've edited a program and then power-off or switch to a different program without saving it, the changes that you made will be lost.

Changes you make to the settings of Global mode will also be lost if you power-off without saving. After editing, be sure to save your changes if you want to keep them.

Never turn off the power while data is being saved. Doing so may harm the memory.

Saving a program

This operation will save all of the Edit 1 and Edit 2 mode parameters of the program that is currently selected.

1. **In Edit 1 or Edit 2 mode, press the WRITE button.**

   The WRITE button will blink, and the save-destination program number 00 – 99 will blink in the display. You can't save to P00 – P99.

2. **Turn the VALUE knob to select the program number for the desired save location.**

   note: When you save a program, the contents of the destination program will be lost.

3. **Press the WRITE button once again; the program will be saved, and you'll return to Live mode.**

   If you decide not to save, press any button other than the WRITE button.

   When you save, the button where the edited program had been assigned will be reassigned to the newly saved program (number).

Saving global settings

This operation will save all Global mode parameters other than the loop phrase start/stop setting. When you turn on the power, the loop phrase will be stopped.

1. **In Global mode, press the WRITE button. The WRITE button will blink, and the display will blink GLb.**

2. **Press the WRITE button once again; the settings will be saved.**

   If you decide not to save, press any button other than the WRITE button.

Important editing parameters

Tune and decay

Edit 1 – Tune (tun): This adjusts the pitch.

Depending on the algorithm, the pitch may change smoothly or in semitone steps. Also depending on the pitch, this may affect the vibration of the skin, or the body resonances.

For algorithms where the Tune parameter has a special role, its specific function is described separately for each algorithm (*See pages 16*, *26*).

For PCM instruments, you can adjust the pitch in semitone steps in a range of four octaves up or down.

Edit 1 – Decay (dcy): This adjusts the time it takes for the sound to decay.

Like the Tune parameter, there are cases where the Decay parameter will affect only the vibration of the skin, or the body resonance.

For algorithms where the Decay parameter has a special role, its specific function is described separately for each algorithm (*See pages 16*, *26*).

Head and rim volume and pan

Edit 1 – Level (LEU): This adjusts the volume balance between the head and rim.

Edit 1 – Pan (Pan): This adjusts the panning of the head and rim.

Edit 2 – Pre EQ (EQ): Use this to select the EQ/amp type that will be most appropriate, depending on whether you're using your hand or a stick to strike the drum.

Reverb and delay

Edit 1 – Reverb (rEb): This adjusts the reverberation added to the sound. You can adjust the reverb type and depth.

Edit 1 – Delay (dLy): This adjusts the delay that is added to the sound. You can adjust the delay time and depth.

Algorithm

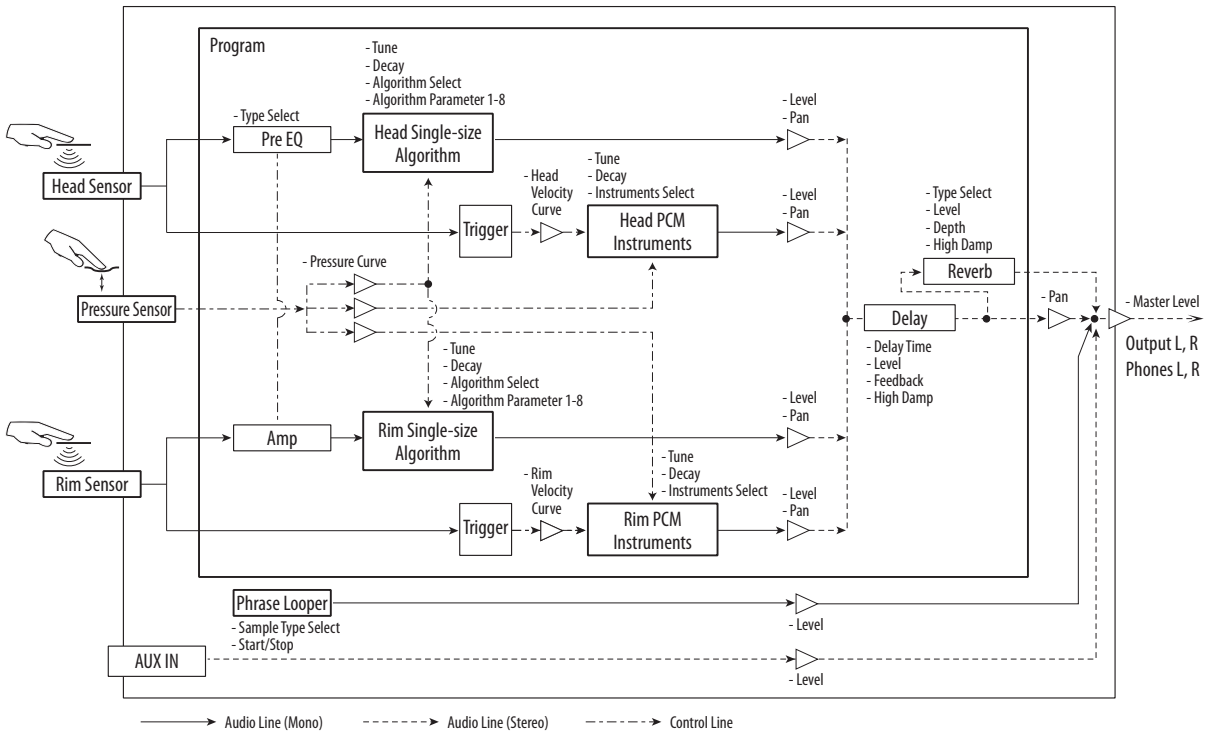
The WAVEDRUM implements a variety of synthesis methods in software, including analog, additive, non-linear, and physical modeling. These methods are then combined, and the result is processed. These combinations are called “algorithms ,” and the WAVEDRUM contains 36 different algorithms. An algorithm collects the elements that determine the sound of an instrument or other sound-producing object, and combines these elements in a wide variety of ways. This means that when a source sound (such as the sound of a drum head being struck) is passed through an algorithm, it will be output as a sound that is uniquely transformed by the characteristics of that algorithm, for example becoming the sound of a snare drum, the ringing of a bell, or the sound of a metal pipe being struck.

Each algorithm consists of different elements that determine the sound in various ways, and each element is expressed as an “amount” (large/small, long/short, positive/negative) such as the size of a guitar's body, the depth of a snare's shell, the length of a pipe, or the den-

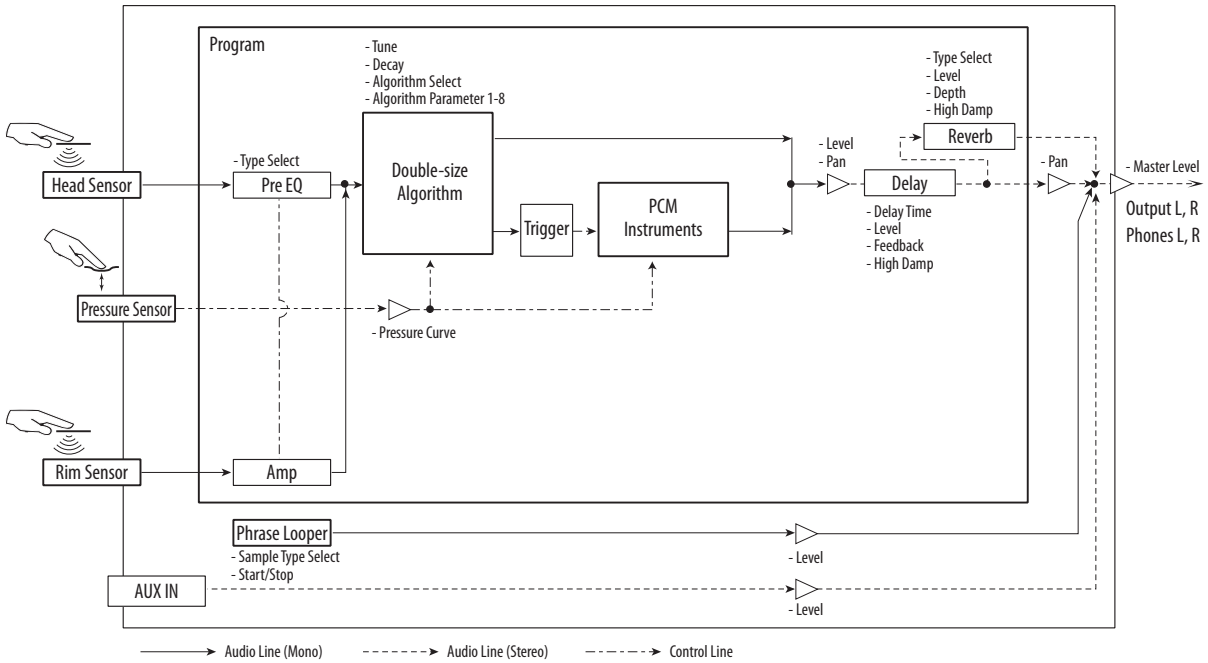
sity of a metal object. These amounts can be varied to synthesize the sound of instruments or other sound-producing objects that could not exist in reality.

The WAVEDRUM's algorithms differ in structure depending on whether they are "single-size" or "double-size."

Single-size Algorithm Type



Double-size Algorithm Type



Program structure for single-size algorithms

Single-size algorithms use two algorithms for each program. These algorithms are used for the head and the rim.

Programs that use a single-size algorithm also allow you to use *PCM instruments* (PCM sound sources) for the head and the rim.

You can freely assign these four sound sources and edit their parameters to create an extremely broad range of sounds ranging from traditional percussion instruments to non-conventional ones; even non-percussive sounds.

The signal flow starts when you strike the head; the audio signal of this strike is input to the head algorithm, processed by DSP, and sent to the mixer section. At the same time, the strike's audio signal is also used to trigger the PCM instrument, and is itself also sent to the mixer section. An EQ is located immediately before this audio signal is input to the algorithm, allowing you to select the most appropriate setting depending on whether you're using your hand or a stick to strike the WAVEDRUM. You can adjust the velocity curve immediately before the signal is input to the PCM instrument, allowing you to choose the way that the force of your strike will vary the volume or tone. For example, you might set this so that a soft strike will produce only the sound processed by the DSP, and the sound of the PCM instrument will be added as you gradually increase the force of your strike.

When you strike the rim, the signal flow is similar to when you strike the head; the audio signal is processed by the rim algorithm and the PCM instrument, and sent to the mixer section.

In addition, you can control the head and rim algorithms and PCM instruments by applying pressure to the head. The curve can be adjusted for this pressure as well, allowing you to specify how the pressure will affect the volume and tone. This can be used to make the instrument behave differently depending on whether pressure is being applied. For example, you might set this so that pressure on the head will mute the DSP-processed sound while allowing the PCM instrument sound to be produced.

The level and pan of the various audio signals sent to the mixer section are adjusted, sent through reverb and delay, and then sent out of the instrument.

Program structure for double-size algorithms

Double-size algorithms are more highly specialized for simulating acoustic instruments.

For this reason, two separate PCM instruments for the head and rim are combined into one, allowing a larger amount of PCM data to be handled.

Within the algorithm, your performance is analyzed in realtime, and the result of this analysis is used to control the PCM instrument, allowing a natural response that reflects your performance in a way that is impossible for a conventional PCM sound module.

Programs that use a double-size algorithm contain only one algorithm.

This algorithm contains inputs for both the head and rim, but this does not mean that they have separate sound sources for each; rather, the head and rim input signals are mixed and input to the single algorithm.

Since the PCM instrument is linked with the algorithm, it cannot be specified independently.

The signal flow starts when you strike the head or rim; these audio signals are input to the algorithm.

The signal that is input to the algorithm is DSP-processed and sent to the mixer. At the same time, the signal is analyzed to generate a trigger that sounds the appropriate PCM instrument.

The PCM instrument produces sound in response to this trigger, and the sound is sent to the mixer section.

For the head, you can use an EQ to adjust the signal immediately before it is input to the algorithm. You can also use pressure on the head to control the volume or tone of the algorithm and the PCM instrument. The pressure curve can also be adjusted.

The level and pan of the audio signals sent to the mixer section are adjusted, sent through reverb and delay, and then sent out of the instrument.

Edit 1 – Algorithm Select (ALG): This selects the algorithm.
Edit 2 – Head Algorithm 1, 2 (H.14, H.58),
Edit 2 – Rim Algorithm 1, 2 (r.14, r.58): Adjusts the parameters of the algorithm.

Audio input and loop phrase playback

The stereo audio signal of the program, the stereo audio signal from the AUX IN jack, and the loop phrase audio are finally combined and sent out of the WAVEDRUM.

Global – Common (Com): Here you can set the pan following the delay effect, and the volume for the AUX IN jack. You can also select the loop phrase, start and stop it, and control its level.

Parameter list

Edit 1 (Ed 1)

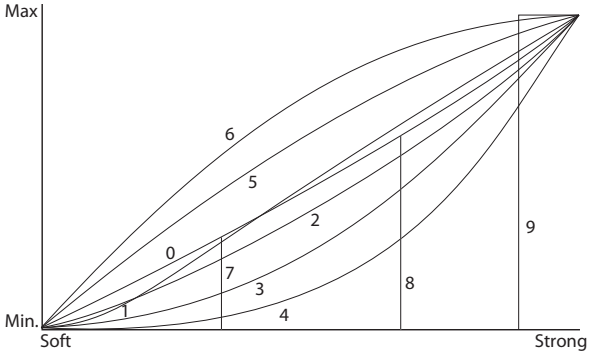
For details on how to access parameters, refer to "Basic editing procedure" (*See page 8*).

* In the list below, "***S***" and "***D***" indicate explanations for single-size and double-size algorithms respectively. The available parameters will differ depending on whether Edit 1 mode 5. Algorithm Select (ALG) is set to a single-size algorithm 01...26 or a double-size algorithm 27...36. With the exception of 10. Reverb (rEV) and 11. Delay (dLY), the items of Button 2–4 are shown as "- - - " and cannot be edited.

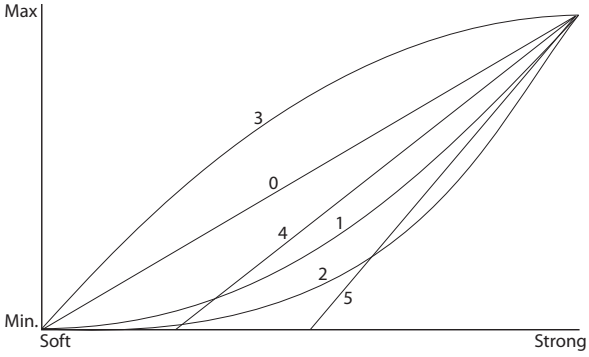
Page#. Parameter	Button 1	Button 2 *	Button 3 *	Button 4 *
1. Tune (tUn)	hd.A 000...100 ***S****: Specifies the pitch of the head algorithm. ***D****: Specifies the pitch of the algorithm. (*See page 9*)	hd.P -24...24 ***S****: Specifies the pitch of the head PCM instrument in semitones (100 cents). The range is 4 octaves up or down. ***D****: ---	rim.A 000...100 ***S****: Specifies the pitch of the rim algorithm. (*See page 9*) ***D****: ---	rim.P -24...24 ***S****: Specifies the pitch of the rim PCM instrument in semitones (100 cents). The range is 4 octaves up or down. ***D****: ---
2. Decay (dcY)	hd.A 000...100 ***S****: Specifies the decay time for the sound of the head algorithm. ***D****: Specifies the decay time for the sound of the algorithm. (*See page 9*)	hd.P -99...99 ***S****: Specifies the decay time for the sound of the head PCM instrument. ***D****: ---	rim.A 000...100 ***S****: Specifies the decay time for the sound of the rim algorithm. (*See page 9*) ***D****: ---	rim.P -99...99 ***S****: Specifies the decay time for the sound of the rim PCM instrument. ***D****: ---
3. Level (LEV)	hd.A 000...100 ***S****: Specifies the volume of the head algorithm. ***D****: Specifies the volume of the algorithm.	hd.P 000...100 ***S****: Specifies the volume of the head PCM instrument. ***D****: ---	rim.A 000...100 ***S****: Specifies the volume of the rim algorithm. ***D****: ---	rim.P 000...100 ***S****: Specifies the volume of the rim PCM instrument. ***D****: ---
4. Pan (PAn)	hd.A L50...r50 ***S****: Specifies the pan of the head algorithm. L values place the sound to the left, r values to the right, and 00 places the sound in the center. ***D****: Specifies the pan of the algorithm.	hd.P L50...r50 ***S****: Specifies the pan of the head PCM instrument. ***D****: ---	rim.A L50...r50 ***S****: Specifies the pan of the rim algorithm. ***D****: ---	rim.P L50...r50 ***S****: Specifies the pan of the rim PCM instrument. ***D****: ---
5. Algorithm Select (ALG)	hd.A 01...36 Selects the algorithm. (*See page 16*, *26*) 01...26: Single-size algorithm for the head. 27...36: Double-size algorithm.	hd.P 001...100 ***S****: Selects the head PCM instrument. (*See Voice Name List*) ***D****: ---	rim.A 01...25 ***S****: Selects a single-size algorithm for the rim (*See page 16*). However 26 1812 cannot be selected. This can be selected only if a single-size algorithm is selected for the hd.A parameter at left. ***D****: ---	rim.P 001...100 ***S****: Selects the rim PCM instrument. (*See Voice Name List*) ***D****: ---
6. Velocity Curve (U.Cr)	---	hd.P 0...9 ***S****: Selects a curve that determines how the volume or tone of the head PCM instrument will be affected by how strongly you strike the head. (*See diagram below.*) ***D****: ---	---	rim.P 0...9 ***S****: Selects a curve that determines how the volume or tone of the head PCM instrument will be affected by how strongly you strike the rim. (*See diagram below.*) ***D****: ---

Page#. Parameter	Button 1	Button 2 *	Button 3 *	Button 4 *
7. Pressure Curve (P.Cr)	hd.A 0...5 Selects a curve that determines how the volume or tone of the algorithm will be affected by pressure applied to the head. (*See diagram below.*)	hd.P 0...5 ***S****: Selects a curve that determines how the volume or tone of the head PCM instrument will be affected by pressure applied to the head. (See diagram below.) ***D****: ---	---	rim.P 0...5 ***S****: Selects a curve that determines how the volume or tone of the rim PCM instrument will be affected by pressure applied to the head. (See diagram below.) ***D****: ---
8. Pressure Tune (P.tn)	---	hd.P -12...12 ***S****: Specifies how the pitch of the head PCM instrument will be affected by pressure applied to the head. This setting specifies the number of semitones (up to +/-1 octave) by which the pitch will change when the maximum pressure is applied. ***D****: ---	---	rim.P -12...12 ***S****: Specifies how the pitch of the rim PCM instrument will be affected by pressure applied to the head. This setting specifies the number of semitones (up to +/-1 octave) by which the pitch will change when the maximum pressure is applied. ***D****: ---
9. Pressure Decay (P.dc)	---	hd.P -50...50 ***S****: Specifies how the decay time of the head PCM instrument will be affected by pressure applied to the head. This setting specifies the change produced when the maximum pressure is applied. ***D****: ---	---	rim.P -50...50 ***S****: Specifies how the decay time of the rim PCM instrument will be affected by pressure applied to the head. This setting specifies the change produced when the maximum pressure is applied. ***D****: ---
10. Reverb (rEb)	typ 00...10 Selects the type of reverb. 00: Off, 01: Slap, 02: Spring1, 03: Spring2, 04: Plate, 05: Garage, 06: Chamber, 07: Canyon, 08: Room, 09: Studio, 10: Hall	bal 000...100 Specifies the effect level.	dEP 00...90 Specifies the reverb decay time.	HdP 000...100 Specifies the amount of high-frequency damping.
11. Delay (dLY)	ti.m 000...200 Specifies the delay time in 0.01 second units, up to a maximum of 2 seconds.	bal 000...100 Specifies the effect level.	Fb 00...99 Specifies the amount of feedback.	HdP 000...100 Specifies the amount of high-frequency damping.

6. Velocity curve diagram



7. Pressure curve diagram



Edit 2 (Ed2)

For details on how to access parameters, refer to "Basic editing procedure" (*See page 8*).

* In the list below, "***S***" and "***D***" indicate explanations for single-size and double-size algorithms respectively. The available parameters will differ depending on whether Edit 1 mode 5. Algorithm Select (ALG) is set to a single-size algorithm 01...26 or a double-size algorithm 27...36.

Since the parameters differ depending on the algorithm, the range of available values will also differ. For details on the parameters and their ranges, please refer to the explanation of each algorithm.

Page#. Parameter	Button 1	Button 2	Button 3	Button 4
1. Pre EQ (EQ)	typ H-H...S-n	---	---	---
	This lets you specify whether you're using your hand or a stick to play the WAVEDRUM. For the rim, you can choose settings that are appropriate for performing by rubbing the notches. This setting uses the head EQ and rim amp to control the amount of input that is sent to the algorithm. Choose one of the following five combinations according to how you're playing the WAVEDRUM. H-H: You're using your hand to play both the head and the rim. H-S: You're using your hand to play the head, and a stick to play the rim. S-S: You're using a stick to play both the head and the rim. H-n: You're using your hand to play the head, and the notches to play the rim. S-n: You're using a stick to play the head, and the notches to play the rim. Be aware that if H-H is selected, striking the rim with a stick will produce a high volume.			
2. Head Algorithm1 (H.1 4)	hd1 *	hd2 *	hd3 *	hd4 *
	S*: Edit parameters 1–4 of the head single-size algorithm. (*See page 16*) ***D****: Edit parameters 1–4 of the double-size algorithm. (*See page 26*)			
3. Head Algorithm2 (H. 58)	hd5 *	hd6 *	hd7 *	hd8 *
	S*: Edit parameters 5–8 of the head single-size algorithm. (*See page 16*) ***D****: Edit parameters 5–8 of the double-size algorithm. (*See page 26*)			
4. Rim Algorithm1 (r.1 4)	rm1 *	rm2 *	rm3 *	rm4 *
	S*: Edit parameters 1–4 of the rim single-size algorithm. (*See page 16*) ***D****: ---			
5. Rim Algorithm2 (r. 58)	rm5 *	rm6 *	rm7 *	rm8 *
	S*: Edit parameters 5–8 of the rim single-size algorithm. (*See page 16*) ***D****: ---			

Global (GLb)

For details on how to access parameters, refer to "Basic editing procedure" (*See page 8*).

Page#. Parameter	Button 1	Button 2 *	Button 3 *	Button 4 *
1. Common (Con)	Pan L50...r50 Specifies the pan following the delay effect. L values place the sound to the left, r values to the right, and 00 places the sound in the center. (Default Value: 0)	A.In 000...100 Specifies the AUX IN mix level. (Default Value: 0)	LoP 001...100 Selects the loop phrase that will be played. (Default Value: 0)	PLY, oFF / 000...100 Plays the loop phrase. Play/off will alternate each time you press button 4. While playing, you can use the VALUE knob to adjust the volume. (Default Value: off/38)
2. Head Calibration (H.cd)	Lo 000...100 The input signal from the head is attenuated when it falls below a specified level. This parameter specifies the threshold level below which this will occur (*See page 29*). (Default Value: 7)	SEn 000...100 Specifies the sensitivity with which your striking force on the head will affect the head PCM instrument or the PCM instrument of a double-size algorithm. (Default Value: 20)	---	---
3. Rim Calibration (r.cd)	Lo 000...100 The input signal from the rim is attenuated when it falls below a specified level. This parameter specifies the threshold level below which this will occur (*See page 29*). (Default Value: 7)	SEn 000...100 Specifies the sensitivity with which your striking force on the rim will affect the rim PCM instrument. (Default Value: 20)	---	---
4. Pressure Calibration (P.cd)	Val 000...100 Indicates the current value of the pressure sensor. Apply pressure on the head, note the minimum and maximum readings, and adjust the P.Lo and P.Hi settings if necessary (*See page 29*).	P.Lo 00...99 Specifies the minimum value that is detected as pressure applied to the head. (Default Value: 5)	P.Hi 001...100 Specifies the maximum value that is detected as pressure applied to the head. (Default Value: 100)	---

Adjusting the volume of a device connected to the AUX IN connector

1. As described in "Connecting audio devices" and "Turning the power on" (*See page 6*), connect your audio device to the WAVEDRUM's AUX IN jack and turn on the power.
2. Hold down the BANK/MODE button and press button 4 to enter Global mode.
3. Press the BANK/MODE button (several times). The display will indicate Con (Common).
4. Press button 2 to make the display indicate A.In and the value.
5. Use the controls of the connected audio device and the WAVEDRUM's mix level to adjust the volume. Turn the VALUE knob to adjust the WAVEDRUM's mix level.

note: We recommend that you raise the mix level of the AUX IN jack only when you're using it. However if you are using it all the time, and would like to leave the mix level raised, you can save this setting. Press the WRITE button twice to save the setting. For more details on saving, refer to *page 9*.

Playing back a loop phrase

1. Hold down the BANK/MODE button and press button 4 to enter Global mode.
2. Press the BANK/MODE button (several times). The display will indicate Con (Common).
3. Press button 4. The loop phrase will sound. Each time you press the button, the status will alternate between start (PLY) and stop (oFF).
4. To adjust the volume, turn the VALUE knob when button 4 selected.
5. To switch the loop phrase, press button 3 to make the display indicate LoP, and turn the VALUE knob (*See Voice Name List*).

- If you want to play a different program, hold down the BANK/MODE button and press button 1 to enter Live mode, and then switch the program. To stop playback, hold down the BANK/MODE button and press button 4 to enter Global mode, and press button 4 in the Con (Common) page.

note: You can't change the playback speed of the loop phrase.

Single-size algorithm

Tune (Default Value), Decay (Default Value)

Parameter#: Parameter Name Value Min...Max (Default Value)

01 Udu

This algorithm creates the sound of a ceramic pot being struck. When you strike near the center of the head, the sound will be as if you struck the mouth of the pot. The length of the resonance is controlled by the setting of Decay, and by the length of time your hand is in contact with the head. The pitch of the sound of the mouth being struck can be set by Tune, but if you press down on the head with a certain amount of pressure, it will sound as though the mouth of the pot has been closed, and the pitch will be one octave lower than the setting. By increasing and decreasing the pressure you apply, you can create vibrato-like effects. **Tune (18), Decay (76)**

hd1/rm1: Clang Pitch **000...100 (78)**
This parameter adjusts the pitch of the "clang" produced by striking the side of a ceramic pot.

hd2/rm2: Clang Decay **000...100 (80)**
This parameter adjusts the decay time of the sound produced by striking the side of the pot.

hd3/rm3: Clang Color **000...100 (87)**
Higher settings of this parameter will result in a longer resonance after the side of the pot is struck, and also a more metallic sound with more overtones.

hd4/rm4: Clang Height **000...100 (13)**
Increasing this value will increase the height of the pot.

hd5/rm5: Clang Width **000...100 (33)**
Increasing this value will increase the diameter of the mouth of the pot.

hd6/rm6: Clang Level **000...100 (35)**
This parameter adjusts the volume of the sound when struck.

hd7/rm7: Boom Level **000...100 (100)**
This parameter adjusts the volume of the sound when the mouth of the pot is struck.

hd8/rm8: Clang Type **000...100 (80)**
Increasing this value will increase the number of overtones, producing a more complex resonance. The amount of change will depend on the Clang Pitch value.

02 Temple

This algorithm produces the sound of a temple bell, but also allows you to create continuous changes in pitch by pressing the head. When you press even harder, you will hear a metallic noise. The pitch and decay of the overall sound can be adjusted using Tune and Decay, but the other parameters allow you to make detailed adjustments to the bell's tone, the direction of pitch change (whether the pitch will rise or fall when you apply pressure). The parameters in this algorithm have an important and complex effect on each other. This means that modifying the value of one parameter will change the way that the other parameters affect the sound. **Tune (50), Decay (97)**

hd1/rm1: Bell Color **000...100 (60)**
As this value is increased the sound will become brighter, and as it is decreased the sound will become darker.

hd2/rm2: Harmonic Shift **–50...50 (0)**
This parameter makes the overtones change. Depending on the settings of Bell Color and Bell Type, the results of adjusting this parameter may differ greatly, from simple pitch changes to complex changes where the timbre itself changes dramatically.

hd3/rm3: Bell Type **000...100 (100)**
As this value is increased, the pitch and overtones of the bell will change, resulting in a rougher sound. Depending on the settings of Bell Color and Harmonic Shift, it is also possible to create sounds similar to a bass guitar.

hd4/rm4: Bend Range **000...100 (74)**
This parameter adjusts the amount and direction that the pitch will change when you press the head. Positive (+) settings of this parameter will cause the pitch to rise when you press the head. Negative (-) settings will cause the pitch to fall when you press the head.

hd5/rm5: Pressure Level **000...100 (55)**
This parameter adjusts the level of the continuous noise that is heard when you press the head.

hd6/rm6: Bell Height **000...100 (20)**
Increasing this value will change the height of the bell.

hd7/rm7: Bell Width **000...100 (32)**
Increasing this value will change the diameter of the bell.

hd8/rm8: Bell Thickness **000...100 (75)**
Increasing this value will increase the thickness of the bell.

03 WoodDrum

This algorithm creates a conga-like sound. Open shots will produce a ringing resonance, and slap shots or mutes can also be used to in the same way as on a conga drum. You can create effects similar to adjusting the resonance on an analog filter. Depending on the settings, you can create continuous oscillating sounds similar to an analog synthesizer that change in pitch when you press the head.

Tune (85), Decay (70)

hd1/rm1: Wood Type **000...100 (48)**
As this value is increased, the sound will have more overtones, a longer resonance, and a more metallic timbre. The result is similar to striking a PVC pipe.

hd2/rm2: Shell Decay **000...100 (76)**
This parameter adjusts the time over which the shell body resonance will decay.

hd3/rm3: Shell Pitch **000...100 (95)**
This parameter adjusts the pitch at which the shell resonates.

hd4/rm4: Shell Level **000...100 (62)**
This parameter adjusts the volume level of the shell resonates.

hd5/rm5: Mute Cutoff **000...100 (2)**
This parameter adjusts the center frequency of the resonance filter that is controlled by muting.

hd6/rm6: Mute Resonance **000...100 (9)**
This parameter adjusts the amount of resonance of the filter that's used when you press the head. Depending on the settings of other parameters, you can create a continuous oscillation sound that changes pitch according to how the head is pressed.

hd7/rm7: Mute Pitch **000...100 (25)**
This parameter adjusts the amount of change in the cutoff frequency of the filter that's used when you press the head. This parameter also affects the way that the pitch will change for the oscillation sound that occurs when you raise the *Mute Resonance* setting.

hd8/rm8: Velocity Curve **000...100 (0)**
As this value is increased, you will have to play harder to make the drum sound. This parameter doesn't change the effect that occurs when you press the drumhead.

04 Analog

This algorithm creates a continuous sound similar to an analog synthesizer with two oscillators. The force used to strike the drum will affect the pitch difference between the two oscillators, or affect the cutoff frequency of the filter. The filter cutoff can also be changed by applying pressure to the head. **Tune (2), Decay (97)**

hd1/rm1: Filter Cutoff **000...100 (15)**
This parameter adjusts the cutoff frequency of the low pass filter.

hd2/rm2: Resonance **000...100 (0)**
This parameter adjusts the amount of resonance for the filter. Higher settings will produce a continuous oscillating tone.

hd3/rm3: Pitch EG Depth **000...100 (0)**
This parameter adjusts the amount of pitch difference that will occur between the two oscillators each time you strike the drum. Higher settings will produce a chorus-type effect that adds depth each time you play.

hd4/rm4: Filter EG Depth **000...100 (100)**
Adjust the amount of filter cutoff frequency change that occurs each time you strike the drum.

hd5/rm5: Pressure Resonance **–50...50 (–25)**
This parameter adjusts the range of change for the resonance filter that is affected by pressure applied to the head.

hd6/rm6: Filter EG Decay **000...100 (22)**
This parameter adjusts how long it will take for the filter cutoff frequency to return to its original state after the initial attack that occurs each time that you strike the drum.

hd7/rm7: Mute Depth **000...100 (1)**
This parameter adjusts the depth of the muting that occurs when you press the head.

hd8/rm8: Effects Level **000...100 (30)**
As this value is increased, there will be a more pronounced stereo effect and the sound will become richer.

05 Arimbao

This algorithm produces the sound of a large double-headed drum. The sound consists of several different sounds; a clear marimba-like sound, the sound of two skins (front and rear) vibrating, and the sound of the drum body. The marimba-like sound will change in pitch depending on how hard the drum is struck. You can also create smooth changes in overall pitch by pressing the head. You can adjust the volume and tone for each of the component sounds. **Tune (70), Decay (61)**

hd1/rm1: Tone Pitch **000...100 (55)**
This parameter adjusts the pitch of the marimba-like sound.

hd2/rm2: Tension Balance **000...100 (0)**
Increasing this value will make the skin more unevenly tensioned.

hd3/rm3: Tone Level **000...100 (87)**
This parameter adjusts the volume level of the marimba-like sound.

hd4/rm4: Drum Type **000...100 (26)**
This parameter adjusts the overtones of the sound of the vibrating skin. As this value is increased, the pitch will fall and the timbre will become rougher.

hd5/rm5: Damping **000...100 (50)**
As this value is decreased, the decay will become shorter, the overtones will change, and the result will sound like a drum being played while pressing the skin to mute it.

hd6/rm6: Bark Level **000...100 (12)**
This parameter adjusts the level of the low body resonance.

hd7/rm7: Pitch Interval **000...100 (74)**
This parameter adjusts the difference in pitch between the two skins (the striking head and the rear head).

hd8/rm8: Dry Level **000...100 (35)**
This parameter adjusts the level of the direct sound of the head (or the rim) being struck.

06 Sawari–A

When the WAVEDRUM is struck normally, this algorithm produces the sound of an Indian drum, but if you press the head as you strike. a pair of *Tambura* drones will be added, positioned at stereo left and right. You can adjust various parameters (balance and tone etc.) of the drum and tambura. **Tune (50), Decay (56)**

hd1/rm1: Buzz Intensity **000...100 (21)**
This parameter adjusts the intensity of the drone sound. Higher settings of this parameter result in a metallic sound with a long decay, and lower settings result in a duller sound with a short decay.

hd2/rm2: L–R Delay **000...100 (10)**
This parameter adjusts the difference in time between when the two drone strings (pitched at the unison and the fifth) begin sounding. Increasing this value will delay the start of the fifth relative to the start of the unison.

hd3/rm3: Drone Pitch **–50...50 (0)**
This parameter adjusts the pitch of the drones in relation to the drum sound. With a setting of 0, the pitch of the drum and the left string will be identical, and the right string will be pitched a fifth above this. As the value of this parameter is increased in the positive (+) direction, the pitch of the left and right drones will rise. As the value is increased in the negative (-) direction, the pitch will fall.

hd4/rm4: Drone Decay **000...100 (100)**
This parameter adjusts the decay time of the drones.

hd5/rm5: Drone Balance **–50...50 (2)**
This parameter adjusts the volume balance between the two drone strings. Positive (+) settings will make the unison-pitched string louder, and negative (-) settings will make the fifth louder.

hd6/rm6: Brightness **000...100 (37)**
This parameter adjusts the tone of the drum. Higher settings will result in a metallic sound with a long decay, and lower settings will result in a darker sound with a short decay.

hd7/rm7: Drone Level **000...100 (76)**
This parameter adjusts the volume level of the drones.

hd8/rm8: Drum Level **000...100 (100)**
This parameter adjusts the volume level of the drum.

07 WindDrum

This algorithm produces a pitched sound similar to a *Baraphone* (an ethnic marimba of Africa) with the addition of a percussive noise sound. Each time you hit the instrument, a note of the scale is played at random. The level and timbre of the noise sound will cange dramatically in response to the strength of your hits.
Tune will adjust the basic pitch in chromatic steps over the range of 39–70. With a setting of 50 the pitch will be *C*.
You can adjust the balance of the component sounds and select the scale to be used. **Tune (53), Decay (93)**

hd1/rm1: Fine Tuning **000...100 (50)**
This parameter allows you to make fine adjustments over a range of a whole tone to the pitch set by 'Tune'. When this parameter is defined to a value of 50, the pitch will be as set by the 'Tune' parameter.

hd2/rm2: Scale Select **0...7 (3)**
This parameter allows you to select the scale to be played from eight types of scale 0–7. For details on the scales available, refer to “About the preset scales”.
(*See page 25*)

hd3/rm3: Balance **–50...50 (30)**
This parameter allows you to adjust the volume balance between the pitched sound and the noise sound. Positive (+) settings will make the pitched sound louder, and negative (-) settings will make the noise sound louder.

hd4/rm4: Tone Decay **000...100 (70)**
This parameter adjusts the decay time for the pitched sound.

hd5/rm5: Interval **000...100 (10)**
This parameter adjusts the pitch difference between the two pitched sounds.

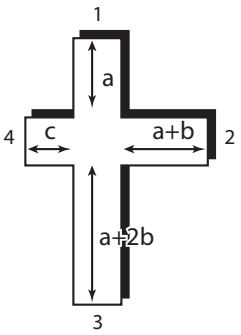
hd6/rm6: Noise Filter **000...100 (10)**
Adjust the amount of change for the resonance filter that is applied to the noise sound according to how hard you strike.

hd7/rm7: Noise Decay **000...100 (53)**
This parameter adjusts the decay time of the noise sound.

hd8/rm8: Noise Color **000...100 (46)**
This parameter makes dramatic changes in the tonal character of the noise sound.

08 Triangle

This algorithm produces the sounds of small metal percussion; cowbells, agogo bells, triangles, etc. This algorithm uses the DSP to create a physical model of a cross-shaped metal vibrating body as shown in the following diagram.



You can adjust the length of the four arms (projections) and their thickness to create a variety of metallic sounds.

Tune (76), Decay (98)

hd1/rm1: Brightness **000...100 (99)**
As this value is decreased, the resonance will become shorter and the pitch will become lower. The result will be similar to muting a triangle by holding it in your hand.

hd2/rm2: Pitch 1 **000...100 (90)**
In the physical model of the diagram above, this parameter sets the value of length a (the length of arm 1).

hd3/rm3: Pitch 2 **000...100 (90)**
In the physical model of the diagram above, this parameter sets the value of length b.

hd4/rm4: Pitch 3 **000...100 (90)**
This parameter sets the value of length c (the length of arm 4).

hd5/rm5: Metal Type 1 **000...100 (8)**
This parameter sets the thickness of arm 1.

hd6/rm6: Metal Type 2 **000...100 (18)**
This parameter sets the thickness of arm 2.

hd7/rm7: Metal Type 3 **000...100 (24)**
This parameter sets the thickness of arm 3.

hd8/rm8: Metal Type 4 **000...100 (13)**
This parameter sets the thickness of arm 4.

09 Water

This algorithm produces a drum sound where the pitch changes in a complex way like that of a talking drum, together with the sound of flowing water when you apply pressure to the head.

You can make adjustments to the pitch and timbre for each of the component sounds. **Tune (58), Decay (82)**

hd1/rm1: Pitch Change **000...100 (99)**
This parameter adjusts the amount that the drum's pitch will change.

hd2/rm2: Brightness **000...100 (32)**
As this value is increased, the high frequencies of the drum sound will be emphasized, resulting in a more metallic sound.

hd3/rm3: Drum Type 1 **000...100 (42)**
This models a drum where the top and bottom diameters differ, like a djembe. Increasing this value will change the top diameter of the drum.

hd4/rm4: Drum Type 2 **000...100 (82)**
Increasing this value will change the bottom diameter of the drum.

hd5/rm5: Portamento **000...100 (80)**
This parameter adjusts the amount of portamento that smoothly connects changes in the drum's pitch.

hd6/rm6: Pressure = Level **000...100 (90)**
This parameter adjusts the volume of the water sound that is produced when you apply pressure to the head.

hd7/rm7: Water Pitch **000...100 (28)**
This parameter adjusts the pitch of the sound of the water flowing inside the drum.

hd8/rm8: Water Strength **000...100 (63)**
This parameter adjusts the force of the water flowing inside the drum.

10 BigHand

This algorithm produces a sound with an aggressive attack and a lingering resonance, similar to striking a metal oil drum. Hits on the edge of the head will produce a sharp and noisy slap sound.
You can get results similar to an analog filter being driven into an oscillator. Filter settings can be made to produce analog synthesizer-type oscillation sounds.
Tune (46), Decay (86)

hd1/rm1: Drum Type **000...100 (66)**
This parameter creates complex changes in pitch and overtone structure.

hd2/rm2: Bass Tone Level **000...100 (98)**
This parameter adjusts the level of the body resonance. As this value is increased, the low and long resonance will become louder.

hd3/rm3: Slap Level **000...100 (40)**
This parameter adjusts the volume level of the slap sound.

hd4/rm4: Slap Decay **000...100 (80)**
This parameter adjusts the time over which the slap sound will decay.

hd5/rm5: Slap Color **000...100 (37)**
This parameter adjusts the tone color of the slap sound. As this value is increased, the sound will become more defined and similar to a snare drum.

hd6/rm6: Slap Filter **000...100 (86)**
This parameter adjusts the cutoff frequency of the filter applied to the slap sound.

hd7/rm7: Slap Resonance **000...100 (55)**
As this value is increased, an oscillation sound will be added to the slap sound that passes through the filter. The pitch of the oscillation is determined by the *Slap Filter* parameter.

hd8/rm8: Threshold **000...100 (25)**
This parameter adjusts the point where stronger hits on the edge of the head will begin to produce a noisy slap sound.

11 Steel ST

This algorithm produces the sound of the *Berimbau*, a Brazilian instrument that consists of a hunting bow with a small gourd attached as a resonator, and played by tapping the bowstring with a stick. The pitch of the Berimbau can be varied by touching a stone to the string, and the tone can be varied by moving the opening of the gourd closer to or farther from the body of the musician. In this algorithm, these effects are produced by pressing the head.
You can adjust the amount that the pitch and tone will change, and set the force of pressure on the head for which the sound will change. **Tune (40), Decay (94)**

hd1/rm1: Brightness **000...100 (75)**
As this value is increased, the sound will become more metallic with a longer resonance. As this value is decreased, the sound will have a shorter resonance, becoming similar to a muted string.

hd2/rm2: Pressure Pitch **000...100 (21)**
This parameter adjusts the degree of how pressing the head will raise the pitch.

hd3/rm3: Pressure Color **000...100 (6)**
As this value is increased, the sound will become lighter and brighter. As this value is decreased, the sound will become deeper and darker. This parameter acts like changing the size of the resonator (gourd).

hd4/rm4: Pressure Range **–50...50 (15)**
This parameter adjusts the direction and width of the frequency range where the filter will sweep.

hd5/rm5: Threshold **000...100 (50)**
This parameter adjusts the force of pressure on the head where the pitch will begin to rise.

hd6/rm6: Balance **–50...50 (10)**
This parameter adjusts the balance between the wah sound from the filter and the unfiltered sound. Positive (+) settings will make the wah sound louder, and negative (-) settings will make the unfiltered sound louder.

hd7/rm7: Wah Depth **000...100 (59)**
This parameter adjusts the depth of the wah effect that occurs when you press the head. As this value is lowered, the wah will be applied stronger.

hd8/rm8: Gauge **000...100 (82)**
This parameter adjusts the thickness of the string.

12 Mo'Daiko

This algorithm produces the sound of a taiko drum with vibrato applied. Applying pressure to the head will vary the drum's pitch and decay.

You can adjust the speed and depth of the drum's vibrato, and adjust the degree of pitch change. **Tune (80), Decay (87)**

hd1/rm1: Drum Type **000...100 (94)**
As this value is increased, the pitch of the drum sound will fall, and deeper vibrato will be applied.

hd2/rm2: Pitch EG Depth **000...100 (18)**
This parameter adjusts the amount of how the drum's pitch will be affected by the force of your strike each time you strike drum. Values of 000–010 will make the pitch fall, and values of 011–100 will make the pitch rise.

hd3/rm3: LFO Rate **000...100 (12)**
This parameter adjusts the speed of the vibrato applied to the drum sound.

hd4/rm4: LFO Depth **000...100 (25)**
This parameter adjusts the depth of the vibrato applied to the drum sound.

hd5/rm5: Damping **000...100 (52)**
Decreasing this value will produce a shorter resonance with a muffled feel.

hd6/rm6: Pressure Pitch **000...100 (100)**
This parameter adjusts how the amount of pressure that's the amount by which pressure applied to the head will change the pitch.

hd7/rm7: Resonance Sweep **000...100 (10)**
This parameter adjusts how much the resonance will be swept according to how hard you strike.

hd8/rm8: Mute Depth **000...100 (100)**
This parameter adjusts how much muting will occur when you apply pressure to the head.

13 Sawari–B

This algorithm produces the sounds of two string instruments used in Indian music: the *Sitar* and the *Tambura*. The sitar is a melodic instrument with many sympathetic strings. The tambura on the other hand plays a drone with an unchanging pitch. Both instruments are designed so that the vibrating string comes in contact with a rounded bridge, adding a characteristic buzz to the sound.
When the WAVEDRUM is played normally, only the tambura will sound, and when you press the head the sitar will be heard as well. By pressing harder, you can smoothly control the pitch of the sitar. By applying additional pressure you can vary the sitar's pitch either smoothly or within a specified scale.

You can adjust the amount of buzz, and adjust the tone color of the sitar and tambura, etc. **Tune (50), Decay (96)**

hd1/rm1: Bend Range **000...100 (48)**
This parameter adjusts how much the pitch of the sitar will change when you press the head. This parameter is valid if the Bend/Scale Select setting is 0.

hd2/rm2: Decay Balance **–50...50 (0)**
This parameter adjusts the balance of the length of time that the sitar and tambura will sustain. Negative (-) settings will cause the sitar to have a longer decay, and positive (+) settings will cause the tambura to have a longer decay.

hd3/rm3: Level Balance **–50...50 (0)**
This parameter adjusts the volume balance of the sitar and tambura. Negative (-) settings will cause the sitar to be louder, and positive (+) settings will cause the tambura to be louder.

hd4/rm4: Top Color **000...100 (89)**
This parameter adjusts the tone color of the sitar. Higher settings will produce a longer-sustaining and brighter sound.

hd5/rm5: Drone Color **000...100 (89)**
This parameter adjusts the tone color of the tambura. Higher settings will produce a longer-sustaining and brighter sound.

hd6/rm6: Buzz Intensity **000...100 (20)**
This parameter adjusts the intensity of the buzz.

hd7/rm7: Scale Select **0...7 (3)**
If you're varying the sitar's pitch within a scale, this specifies one of seven scales (0–6) where the pitch will change in response to pressure on the head. This parameter is valid if the Bend/Scale Select setting is 1. Preset scale no.7 is not available. For details on each scale, please refer to "About the preset scales". (*See page 25*)

hd8/rm8: Bend/Scale Select **0...1 (1)**
This parameter allows you to select whether the sitar's pitch will change continuously or within a specified scale when you apply pressure to the head. The pitch change will occur continuously if this is set to 0, or within a scale if this is set to 1.

14 Tabla

This algorithm produces the sounds of two drums used in Indian music; the *Tabla* and the *Baya*. The tabla is a cylindrical drum made of wood, and the baya is pot-shaped or nearly spherical and made of copper or brass. Both instruments have heads covered with two layers of goatskin, and are played in pairs. Performance techniques can create a diverse range of sounds, but the various types of sounds are called by different names in different schools or systems of music.
The characteristic sound of the tabla is produced by using the fingers to mute one area of the skin as the head is struck, so that the two layers of skin vibrate and buzz against each other, producing a unique pitched sound that is neither like a human voice nor a string instrument. This sound is called *na* (or other names).
The characteristic sound of the baya is produced by using the wrist to press the skin while the fingertips strike the skin. Complex changes in the pitch of the resonant decay can be created by moving the wrist to vary the pressure on the skin. This sound is called *ge* (or other names).
In this algorithm, the outer part of the head plays na and the center of the head plays *ge*. **Tune (47), Decay (89)**

hd1/rm1: Baya Pitch **000...100 (66)**
This parameter adjusts the pitch of the ge sound.

hd2/rm2: Baya Level **000...100 (100)**
This parameter adjusts the volume of the ge sound.

hd3/rm3: Baya Decay **000...100 (61)**
This parameter adjusts the decay time of the ge sound.

hd4/rm4: Bend Curve **000...100 (58)**
This parameter adjusts the way that the pitch of the ge sound will change when you apply pressure to the head. Increasing this value will allow the pitch to change in response to minimal pressure.

hd5/rm5: Damping **000...100 (46)**
Decreasing this value will produce a shorter resonance with a muffled feel.

hd6/rm6: Shell Pitch **000...100 (37)**
This parameter adjusts the pitch of the short and light sound (close to the tabla sound known as te) that is produced when you strike the outer part of the head while pressing the head strongly to mute it.

hd7/rm7: Shell Damping **000...100 (56)**
This parameter adjusts the tone color of the *te* sound. As this value is decreased, the sound will become lighter and more metallic.

hd8/rm8: Shell Decay **000...100 (44)**
Increasing this value will lengthen the decay of the body resonance.

15 Gong1

This algorithm creates various types of metal percussion sounds such as gongs, that have relatively slow attacks and sometimes produce rough low tones accompanied by oscillation. Pressing on the head will mute the resonant decay.
These sounds are created by passing a source sound through several virtual resonators simulated by the DSP, thus creating a sound with a complex overtone structure. This sound is then sent through a filter controlled by an LFO to create beating effects.
The sound can be controlled in a wide variety of ways, and you can create bells or even various metallic creaks or scraping sounds. **Tune (39), Decay (95)**

hd1/rm1: Gong Color **000...100 (41)**
This parameter adjusts the tone color of the original sound that is distributed to the virtual resonator.

hd2/rm2: LFO Depth **–50...50 (–5)**
This parameter adjusts the depth of change that is applied to the filter by the LFO.

hd3/rm3: LFO Rate **000...100 (4)**
This parameter adjusts the speed of the LFO that creates the beating effect.

hd4/rm4: Damping **000...100 (4)**
As this value is increased, the sound will become tighter and have a shorter decay.

hd5/rm5: Gong Type **000...100 (7)**
As this value is increased, the sound will become noisier and sharper, with more high frequency clashing.

hd6/rm6: Harmonic Shift **000...100 (90)**
This parameter adjusts the pitch differences between the various resonating bodies. As this value is increased, the pitch and overtone structure will change in complex ways.

hd7/rm7: Thickness **000...100 (7)**
As this value is increased, the sound will become lighter with a more pronounced high range. As this value is decreased, the sound will become heavier and have more emphasis in the low range. The effect is similar to changing the thickness of a gong.

hd8/rm8: Model Select **0...7 (0)**
This parameter allows you to select one of eight types (0–7) of gong as the source for the sound.

16 Wah Harp

This algorithm produces the sound of mouth harps such as the Jew's Harp, the Brummeisen of Austria, or the Mukkuri of the Ainu people of Japan. The wah effect created by the filter produces unique tones with dramatic changes in overtone structure. Pressing the head with your hand will produce large and dynamic wah effects.
This effect is especially suitable when applied to the sound of the struck rim, which is rich in overtones. While striking the rim or scraping the notches on the edge of the rim, apply pressure to the head to produce dramatic sounds.
You can adjust the wah effect's strength and frequency width. **Tune (54), Decay (90)**

hd1/rm1: Damping **000...100 (68)**
This parameter adjusts the sound of the muted string. Decreasing this value will produce a more muted sound.

hd2/rm2: Wah Color **000...100 (16)**
This parameter adjusts the center frequency of the filter that moves when the wah effect is applied.

hd3/rm3: String Character **000...100 (27)**
This parameter adjusts the character of the string sound. Decreasing this value will make the string sound more muffled.

hd4/rm4: Wah Balance **000...100 (50)**
This parameter adjusts the amount of wah effect that is applied. Increasing this value will produce a wah effect.

hd5/rm5: LoDamp **000...100 (72)**
Increasing this value will cut the low-frequency component of the string.

hd6/rm6: Attack Level **000...100 (30)**
Increasing this value will increase the sound of the attack.

hd7/rm7: Attack LoDamp **000...100 (78)**
Increasing this value will cut the low-frequency component of the attack sound.

hd8/rm8: Bend Range **–50...50 (25)**
This parameter adjusts how the pitch will change in response to the strength of the strike.

17 TalkDrum

This algorithm produces the sound of an African ethnic instrument; the *Talking Drum*. By pressing the head lacing strings on this drum to change the tension of the skin, dramatic pitch bending effects can be achieved.
In this algorithm, pressure on the head will produce similar pitch bending effects. You can independently adjust the tone color of the sounds when the head is pressed and when not pressed, and adjust the level of the rim sound.
Tune (26), Decay (78)

hd1/rm1: Bend Range **000...100 (68)**
This parameter adjusts the amount that the pitch will rise when the head is pressed.

hd2/rm2: Brightness 1 **000...100 (15)**
This parameter adjusts the tone color of the sound when the head is not pressed. As this value is increased, the sound will be rougher and have more overtones.

hd3/rm3: Brightness 2 **000...100 (45)**
This parameter adjusts the tone color of the sound when the head is pressed. As this value is increased, the sound will be rougher and have more overtones.

hd4/rm4: Decay Interval **000...100 (40)**
This parameter adjusts the difference in decay time between the sound when the head is pressed and the sound when the head is not pressed. For high settings of this value, the decay will be shorter when the head is not pressed.

hd5/rm5: Tension **000...100 (80)**
As this value is decreased, the sound will change as if the skin of the drum ware looser. This parameter produces the effect of reducing the tension.

hd6/rm6: Drum Type **000...100 (90)**
This parameter modifies the pitch and overtones in a complex way.

hd7/rm7: Attack **000...100 (51)**
Increasing this value will emphasize the attack sound.

hd8/rm8: Pressure Filter **000...100 (20)**
Adjust the way in which pressure applied to the head will open the filter.

18 Jingle

This algorithm produces the sound of an instrument with many small bells (jingles), such as a rattle or turkish crescent. The pitch of the jingles can be raised or lowered by pressing the head.

Decay adjusts the time length that the jingles are shaken. You can make various adjustments such as the tone color of the jingles, etc. **Tune (55), Decay (20)**

hd1/rm1: Jingle Type **000...100 (99)**
Lower settings of this parameter will produce the sound of two or three small bells jingling freely. Higher settings will produce the sound of a large number of small bells packed more tightly against each other to dampen the decay.

hd2/rm2: Jingle Size **–50...50 (–2)**
This parameter allows major adjustments in the size of the jingle sound. Negative (-) settings will result in a muffled sound as if the bell was muted by being grasped in the hand. Positive (+) settings will let the sound expand, changing to a sound similar to a wall clock striking the hour.

hd3/rm3: Repeat **000...100 (89)**
This parameter allows you to set the length of time that the jingle will sound.

hd4/rm4: Bell Decay **000...100 (83)**
This parameter adjusts the overall decay time of the individual bells. When this value is increased, each bell will have a longer decay time, and the result will be a continuous sound like high notes on an organ.

hd5/rm5: Brightness **000...100 (100)**
When this value is reduced, the metallic resonance will disappear from the bells, resulting in a sound like a shaker or cabasa.

hd6/rm6: Pressure Decay **–50...50 (32)**
This parameter adjusts the degree to which pressure applied to the head will affect the decay of the jingle.

hd7/rm7: Pressure Pitch **–50...50 (0)**
This parameter adjusts how the amount of pressure that's applied to the head will raise the pitch of the jingle.

hd8/rm8: Model Select **0...2 (0)**
This parameter allows you to set the material of the jingle to one of three (0–2) types.

19 Bonga

This algorithm creates the sound of a barrel-shaped or tub-shaped drum, such as a bongo or conga. You can use the same playing techniques (open shots, slap shots, mutes, etc.) as on a conga.

You can make detailed adjustments to the tone color etc. of the mute sound and slap sound. **Tune (73), Decay (43)**

hd1/rm1: Shell Size **000...100 (16)**
This parameter adjusts the pitch of the body resonance heard during the attack.

hd2/rm2: Shell Damp **000...100 (41)**
This parameter adjusts the overtone components of the body resonance heard during the attack.

hd3/rm3: Sub Harmonics **000...100 (2)**
This parameter adjusts the low frequency range of the sound. As this value is increased, the sound will become lighter and harder, with less low frequency sound.

hd4/rm4: Brightness **000...100 (45)**
As this value is increased, the high frequencies will be extended and the sound will become more piercing.

hd5/rm5: Drum Size **000...100 (66)**
As this value is increased, the pitch will become lower and the sound will become rougher. The effect is similar to changing the size of the drum.

hd6/rm6: Slap Level **000...100 (80)**
This parameter adjusts the level of the buzzing sound added to slap shots.

hd7/rm7: Slap Decay **000...100 (1)**
This parameter adjusts the decay time of the slap sound.

hd8/rm8: Slap Color **000...100 (21)**
This parameter adjusts the tone color or the slap sound. As this value is increased, the buzzing will be emphasized, and the sound will become sharper.

20 Koto

This algorithm produces the sound of the Japanese Koto. Each time you strike, a random note of a Japanese scale will sound. By pressing the head, you can simulate the upward pitch bends produced by pressing the string.

Tune will adjust the basic pitch in chromatic steps over a range of 45–62. With a setting of 50, the pitch will be *C*.

You can adjust the location of the pluck, and specify the range of strings that will be used. **Tune (50), Decay (78)**

hd1/rm1: Fine Tune **–50...50 (0)**
Make fine adjustments in a whole-tone range to the pitch set by *Tune*. When this value is 50, the pitch will be the value set by *Tune*.

hd2/rm2: Pluck Position **–50...50 (47)**
This parameter specifies the location on the string where the pluck will occur. When this value is 0, the pluck will occur at 1/2 of the vibrating length of the string; i.e., in the middle. Negative (-) settings will move the pluck toward the movable bridge. Positive (+) settings will move the pluck toward the fixed bridge. Moving the pluck all the way toward either end will cause the sound to resemble the bridge on that side.

hd3/rm3: Damping **000...100 (25)**
As this value is increased, the decay will become shorter, and the tone color will also change, producing a muted effect.

hd4/rm4: String Type 1 **000...100 (22)**
This parameter modifies the overtones of the string between the fixed bridge and the movable bridge on the side where the string is plucked. As this value is increased, the sound will become more metallic, approaching the sound of a square wave on a synthesizer.

hd5/rm5: String Type 2 **000...100 (0)**
This parameter modifies the overtones of the string between the fixed bridge and the movable bridge on the side where the string is note plucked. The effect is the same as *String Type 1*.

hd6/rm6: Plucked Noise **000...100 (30)**
This parameter adjusts the level of noise that occurs when the string is plucked.

hd7/rm7: Bottom String **0...12 (3)**
This parameter specifies the lowest of the 13 strings that will be used, counting from the lowest upward. With a setting of 00, strings are available for use all the way down to the lowest string. With a setting of 12 only the highest string will be available.

hd8/rm8: String Range **0...12 (7)**
Specify the number of strings that will be used, starting with the specified Bottom String.

21 Bamboo

This algorithm produces a bamboo percussion sound that can be used like a marimba. When you strike with a certain range of force, differences in striking force within that range will play different notes within an octave of the selected scale, allowing you to play phrases.

Tune adjusts the basic pitch in chromatic steps over a range of 26–69. With a setting of 50, the pitch will be *C*.

You can select the type of scale and specify the range of striking force that corresponds to the octave of notes in the scale. **Tune (50), Decay (90)**

hd1/rm1: Fine Tune **–50...50 (0)**
This parameter allows you to make fine adjustments to the pitch specified by Tune, within the range of one whole tone. When this value is set to 50, the pitch will be as set by the Tune.

hd2/rm2: Accent Level **000...100 (35)**
This parameter adjusts the volume level of the unpitched accent.

hd3/rm3: Velocity Range **000...100 (15)**
This parameter adjusts the striking force that will produce the note assigned to the strongest strike. (This will be the highest note when *Sequence Type* = 0, and the lowest note when *Sequence Type* = 1.)

hd4/rm4: 2nd Pitch **–50...50 (0)**
This parameter adjusts the pitch of the second partial within a range of +/- one fifth.

hd5/rm5: Pressure Pitch **–50...50 (0)**
This parameter adjusts the amount of pitch change that occurs when you apply pressure to the head.

hd6/rm6: Pressure Range **–50...50 (24)**
This parameter adjusts the degree of force that will be used to apply muting when the head is pressed.

hd7/rm7: Scale Select **0...7 (4)**
This parameter allows you to select one of eight types of scale (0–7). For details on the available scales, refer to "About the preset scales". *See page 25*

hd8/rm8: Sequence Type **0...2 (0)**
This parameter allows you to specify how changes in striking force will correspond to notes in the scale. 0: Stronger strikes will play higher notes. 1: Stronger strikes will play lower notes. 2: Striking force will have no effect on note pitch. (Notes in the scale will be played randomly.)

22 JingDrum

This algorithm produces the sound of a drum with jingling bells attached. When you strike the head, the jingling bells will sound together with the drum. Pressing the head will raise the pitch of the drum.

Both Tune and Decay affect only the drum sound.

You can make major changes in the pitch and tone color of the drum and bells. **Tune (74), Decay (74)**

hd1/rm1: Jingle Level **000...100 (42)**
This parameter adjusts the volume level of the jingle.

hd2/rm2: Drum Level **000...100 (100)**
This parameter adjusts the volume level of the drum sound.

hd3/rm3: Brightness 1 **000...100 (34)**
This parameter allows you to modify the tone color of the drum sound. As this value is increased, the sound will become more metallic with more sustain, like a guitar.

hd4/rm4: Drum Width **000...100 (90)**
As this value is increased the pitch of the drum sound will become lower and the overtones will also change, producing a rougher sound. The effect is similar to greatly loosening the skin of the drum.

hd5/rm5: Pressure Decay **–50...50 (50)**
This parameter adjusts the decay time according to the amount of pressure that is applied to the head.

hd6/rm6: Jingle Pitch **000...100 (39)**
This parameter adjusts the pitch of the bell sound.

hd7/rm7: Jingle Decay **000...100 (47)**
This parameter adjusts the decay time of the bell sound.

hd8/rm8: Brightness 2 **000...100 (100)**
As this value is increased, the metallic resonance will disappear from the bell sound, resulting in a sound like a shaker or cabasa.

23 Don–Hya

Each time you strike, four drum notes will sound in succession. Soft strikes will produce four notes of the same pitch, but stronger strikes will cause the pitch of each note to change, and since the pitch of each note is smoothly connected by portamento, the result will be a complex, undulating phrase. In addition, you can press the head to produce a sustaining noisy sound that smoothly changes in pitch and tone color.

Tune affects only the drum sound.

You can specify the rhythm pattern, and make various adjustments to the tone color of the drum sound and metallic sound. **Tune (70), Decay (84)**

hd1/rm1: Seq. Note Volume **000...100 (50)**
This parameter adjusts the volume level of the muted notes in the pattern selected by 'Motif Select'.

hd2/rm2: Motif Select **0...7 (7)**
Of the four consecutive drum notes, you can select one of eight (0–7) types of muting patterns for the three notes following the initial strike. Since the Seq. Note Volume parameter allows you to set the volume of muted notes, you can create rhythm patterns by making the muted notes softer than unmuted notes. Select one of the following patterns of muted notes. (A dot indicates a muted note, and an x indicates no mute.)

0 = 
1 = 
2 = 
3 = 
4 = 
5 = 
6 = 
7 = 

hd3/rm3: Delay Time **000...100 (20)**
This parameter adjusts the delay time (tempo) of the three delayed notes.

hd4/rm4: Portamento **000...100 (69)**
This parameter adjusts the amount of portamento that connects each drum note.

hd5/rm5: Brightness **000...100 (38)**
This parameter adjusts the tone color of the drum sound. As this value is increased the sound will become more metallic and have a longer resonance.

hd6/rm6: Noise–Color **000...100 (40)**
This parameter adjusts the color of the noise that is heard when you apply pressure to the head. Increasing this value will produce an aggressive sound with a boosted high-frequency range.

hd7/rm7: Noise–Level **000...100 (62)**
This parameter adjusts the volume of noise that is heard when you apply pressure to the head.

hd8/rm8: Pitch Interval **000...100 (100)**
This parameter adjusts how much the drum sound's pitch will change randomly.

24 Mariko

This algorithm produces a normal tom-type drum sound. In addition, striking the outer area of the head will produce marimba-like wood percussion sounds that will have different pitches in response to the force of your strike. In addition to this, striking the rim will produce a high sound with a short decay, similar to a xylophone or glass percussion.

Tune adjusts the pitch of the drum sound. You can adjust the pitch and volume of the marimba sound, etc.
Tune (53), Decay (78)

hd1/rm1: Tone Pitch **000...100 (14)**
This parameter adjusts the standard pitch of the marimba sound that plays when you strike the outer area of the head.

hd2/rm2: Pitch Response **000...100 (100)**
This parameter adjusts how much the force of your strike will change the pitch.

hd3/rm3: Pressure Pitch **000...100 (40)**
This parameter adjusts how much the amount of pressure that's applied to the head will raise the pitch.

hd4/rm4: Tone Level **000...100 (100)**
This parameter adjusts the volume level of the marimba sound.

hd5/rm5: Resonance Balance **000...100 (70)**
This parameter adjusts how much the marimba sound resonates with the drum shell.

hd6/rm6: Brightness **000...100 (19)**
When this value is increased, the sound will become brighter with an overall boost in the high range.

hd7/rm7: Drum Type1 **000...100 (86)**
When this value is increased, the drum sound will become lower in pitch and have a rougher tone. The effect of this parameter changes greatly depending on the settings of the other parameters.

hd8/rm8: Drum Type2 **000...100 (44)**
This parameter adjusts the tone of the drum sound.

25 Upo

When struck normally, this algorithm produces a normal tom-type drum sound. However if you continue pressing the head after you strike, and then release it, a popping sound will be heard the instant you release the head. The volume and pitch of the pop will depend on the force of the initial strike and the force with which you press.

Tune and Decay adjust the pitch and decay of the drum sound. **Tune (63), Decay (71)**

hd1/rm1: Pitch EG Depth **000...100 (36)**
This parameter adjusts how much the force of your strike will affect the pitch of the drum sound at the instant you strike.

hd2/rm2: Harmonics **000...100 (43)**
This parameter modifies the overtones of the drum sound.

hd3/rm3: HiDamp **000...100 (28)**
This parameter adjusts the decay of the overtones of the drum sound.

hd4/rm4: Filter Level **000...100 (25)**
This parameter adjusts the level of the drum sound that will remain even when muted. Increasing this value will produce a more distinctive sound.

hd5/rm5: Filter Cutoff **000...100 (9)**
This parameter adjusts the pitch of the drum sound that will remain even when muted.

hd6/rm6: Pop Level **000...100 (100)**
This parameter adjusts the volume of the pop sound.

hd7/rm7: Pop Pitch **000...100 (13)**
This parameter adjusts the reference pitch of the pop sound.

hd8/rm8: Pop Random **000...100 (23)**
This parameter will randomly change the pitch of the pop sound.

26 1812

This algorithm produces an ensemble of five snare drums. Open rim shots produce the sound of a cannon shot.
Tune and Decay apply only to the snare drum sound.
Tune (86), Decay (32)

note: This algorithm can be used only for the head.

hd1: Pressure Pitch **000...100 (30)**
This parameter adjusts how the amount of pressure that's applied to the head will affect the pitch or tonal character.

hd2: Brightness **000...100 (8)**
This parameter will radically adjust the tonal character of the snare drum. Increasing this value will produce extended overtones that sound like a guitar or piano.

hd3: Ensemble Size **000...100 (58)**
This parameter adjusts the *de-synchronization* of the five snares. As this value is further, the snares will play increasingly out of synchronization, resulting in a thicker sound and more of an ensemble effect.

hd4: Delay Control **000...100 (50)**
Increasing this value will adjust the coherence of the five snare drums when you strike the WAVEDRUM strongly.

hd5: Snappy Level **000...100 (50)**
This parameter adjusts the volume level of the snare wires.

hd6: LoDamp **000...100 (12)**
Increasing this value will cut the low-frequency portion of the snare wires.

hd7: HiDamp **000...100 (100)**
Decreasing this value will cut the high-frequency portion of the snare wires.

hd8: Resonance **000...100 (50)**
This parameter adjusts the amount of change in the LoDamp/HiDamp resonance filter.

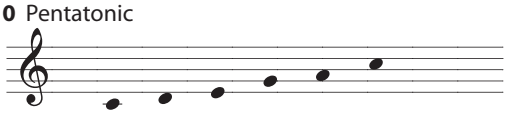
About the preset scales

Some of the algorithms in the WAVEDRUM allow you to play phrases in a particular scale. For some phrases, notes in the selected scale will sound randomly each time you play. For others, the note of the scale that is sounded will depend on how strongly you play.

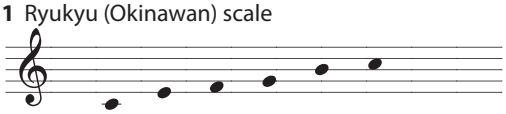
You can choose one of the following eight types of scale. For some algorithms, not all scales are available. For details, refer to the page on each algorithm.

Scale Select is available in the following algorithms.
“07 WindDrum” (See page 18)
“13 Sawari–B” (See page 20)
“21 Bamboo” (See page 23)

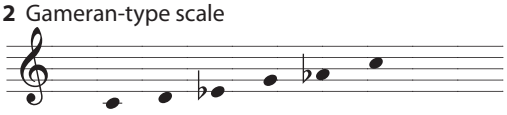
0 Pentatonic



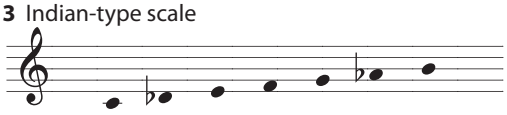
1 Ryukyu (Okinawan) scale



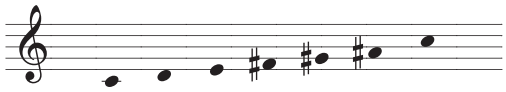
2 Gameran-type scale



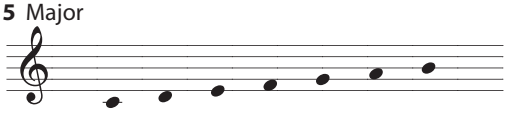
3 Indian-type scale



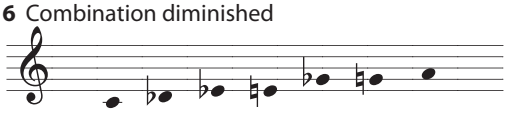
4 Whole tone



5 Major



6 Combination diminished



7 Tonic only…. each note will sound at the pitch specified by the Tune parameter.

Double-size algorithms

Double-size algorithms are organized into three types, each type with three or four algorithms. Algorithms of the same type have the same parameters.

Controlling the sound when playing a double-size algorithm

Programs that use a double-size algorithm allow you to control the PCM sound source (PCM instrument) not only by velocity (striking force) as on a conventional PCM sound module, but also by the tone of your strike on the head. Since the force and tone of your strike will affect the sound, you'll be able to perform with feeling that's closer to that of an acoustic instrument.

This sound control allows you to differentiate between playing mellow (thick) tones and hard (thin) tones.

Here are three specific examples.

- Control by the striking position
  Strike near the center of the head (soft sound), or near the edge of the head (hard sound).
- Control by the striking object
  Strike with a soft object, or with a hard object.
- Control by the striking method
  Strike as when using hand percussion such as a conga or djembe, using open (soft sound) or slap (hard sound).

Parameter#: Parameter Name **Value Min...Max**

Type 1: 27 Conga, 28 Bongo

The algorithms are appropriate for hand percussion such as conga.

hd1: Switching **000...100**
This parameter specifies the mix between the two PCM instruments that are switched according to the tone or position of your strike. With a setting of 100, the two are completely separated.

hd2: PCM Balance **–50...50**
This parameter specifies the volume balance between the two PCM instruments. With a setting of 0, they will have the same volume. Negative (-) settings make PCM1 louder, and positive (+) settings make PCM2 louder.

hd3: Alg-PCM Balance **–50...50**
This parameter adjusts the volume balance between the algorithm and the PCM instrument. With a setting of 0, they will have the same volume. Negative (-) settings make the algorithm louder, and positive (+) settings make the PCM louder.

hd4: Sub Harmonics **000...100**
This parameter adjusts the low-frequency component of the sound. Increasing this value will reduce the amount of low-frequency, producing a lighter and harder sound.

hd5: Brightness **000...100**
Increasing this value will produce a sharper sound with more high frequencies.

hd6: Slap Level **000...100**
This parameter adjusts the level of the vibrating sound that is added by a slap shot.

hd7: Slap Delay **000...100**
This parameter adjusts the decay time of the slap sound.

hd8: Slap Color **000...100**
This parameter adjusts the tone color of the slap sound. Increasing this value will produce a sharp sound with accentuated vibration.

Type 2: 29 Snare Drum 1, 30 Snare Drum 2, 31 Snare Drum 3, 32 Timbales

These algorithms are appropriate for drums that have an attached snare and are played with a stick, such as a snare drum.

hd1: Switching **000...100**
This parameter specifies the mix between the two PCM instruments that are switched according to the tone or position of your strike. With a setting of 100, the two are completely separated.

hd2: PCM Balance **–50...50**
This parameter specifies the volume balance between the two PCM instruments. With a setting of 0, they will have the same volume. Negative (-) settings make PCM1 louder, and positive (+) settings make PCM2 louder.

hd3: Alg-PCM Balance **–50...50**
This parameter adjusts the volume balance between the algorithm and the PCM instrument. With a setting of 0, they will have the same volume. Negative (-) settings make the algorithm louder, and positive (+) settings make the PCM louder.

hd4: Curve **000...100**
This parameter adjusts the response of the shell to your strike, and the resonance of the shell.

hd5: Brightness **000...100**
Increasing this value will increase the high-frequency components of the shell sound and the snare sound.

hd6: Snappy Decay **000...100**
This parameter adjusts the decay time for the sound of the snare.

hd7: Snappy Level **000...100**
This parameter adjusts the level of the sound of the snare.

hd8: Shell Type **0...4**
Choose one of five types of tonal character for the shell.

Type 3:
33 Cajon, 34 Djembe,
35 Bass Drum + Snare Drum 1,
36 Bass Drum + Snare Drum 2

These algorithms are appropriate for percussion in which a single instrument produces two sounds, such as a cajon.

hd1: Switching **000...100**

This parameter specifies the mix between the two PCM instruments that are switched according to the tone or position of your strike. With a setting of 100, the two are completely separated.

hd2: PCM Balance **–50...50**

This parameter specifies the volume balance between the two PCM instruments. With a setting of 0, they will have the same volume. Negative (-) settings make PCM1 louder, and positive (+) settings make PCM2 louder.

hd3: Alg-PCM Balance **–50...50**

Adjust the volume balance between the algorithm and the PCM instrument. With a setting of 0, they will have the same volume. Negative (-) settings make the algorithm louder, and positive (+) settings make the PCM louder.

hd4: Curve **000...100**

This parameter adjusts the response of the shell to your strike, and the resonance of the shell.

hd5: Brightness **000...100**

Increasing this value will increase the high-frequency components of the shell sound and the snare sound.

hd6: Snappy Decay **000...100**

This parameter adjusts the decay time of the sound of the snare.

hd7: Snappy Level **000...100**

This parameter adjusts the level of the sound of the snare.

hd8: Shell Type **0...4**

Choose one of five types of tonal character for the shell.

Default Value

No.	Tune	Decay	hd1	hd2	hd3	hd4	hd5	hd6	hd7	hd8
27	50	36	30	0	0	0	54	50	48	24
28	57	29	50	0	-32	28	85	74	9	51
29	50	56	50	0	-16	14	34	64	66	2
30	50	56	50	0	-20	0	8	83	60	2
31	49	56	50	0	-20	12	34	47	62	3
32	54	60	30	0	-42	35	8	0	0	2
33	50	62	55	0	-35	27	6	55	56	1
34	53	58	46	0	-40	0	18	0	0	2
35	56	52	32	0	-34	27	16	75	30	3
36	54	38	32	0	-36	16	9	85	32	2

Appendix

Restoring the factory settings

Here's how to return the WAVEDRUM's program settings to factory default.

Be aware that when you execute this operation, the contents of the user programs will also be rewritten to factory default.

1. While holding down the WRITE button, press the power switch to turn on the power. The display will blink PLd.
2. Hold down the blinking WRITE button for about one second. The factory settings will start being loaded. When loading is complete, the display will blink End.

Never turn off the power while data is being loaded. Doing so may destroy the data.

3. Turn off the power, and then turn it on again.

Replacing the drum head

If you need to replace the head, please use the optional (separately sold) Replacement Head HD-WD. You may also use 10" drum heads made by Remo Inc.

note: Please be aware that the sound of the WAVEDRUM may change depending on the type of head you install.

Drum head replacement procedure

Before you begin this procedure, you must unplug the power cable of the WAVEDRUM and any cables that connect it with other equipment. Perform the procedure on a stable and flat location.

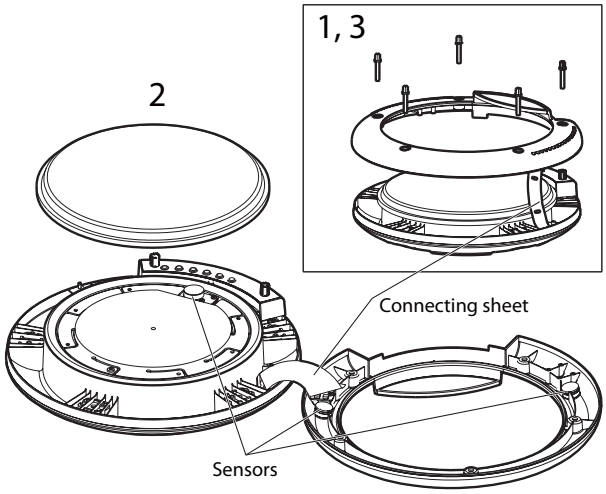
1. Using the included tuning key, sequentially loosen the five tension bolts on the rim, and remove the rim.

   Place the WAVEDRUM on a flat location so that no stress is applied to the connecting sheet that is attached to the rim and the lower case.

2. Remove the old head, and replace it with the new head.

   When doing so, never allow your hand to touch internal components such as the sensors or the circuit board. Take care that foreign objects do not enter the WAVEDRUM.

3. Once you have replaced the head, place the rim back in its original position, and tighten the tension bolts. For details on how to tighten them, refer to the following section: "Tuning the drum head."
4. After you've tuned the drum head, calibrate the head, rim, and pressure sensors, and adjust the sensitivity as desired (*See page 29*).



Tuning the drum head

- To tune the drum head, use the included tuning key to tighten each tension bolt, skipping one bolt each step to ensure that the head is tensioned evenly.

Avoid tightening the bolts excessively when tuning the head. Doing so will cause deformation and possibly malfunctions.

On conventional percussion instruments, the tension bolts must be tightened equally to apply even tension to the head. If this is not done, not only will the instrument not sound good, but the life of the instrument can also be affected. Likewise for the WAVEDRUM, uneven tuning will cause the head surface to become warped and remain in contact with the cushion and sensor, eventually causing malfunctions.

If you must use commercially-available tension bolts due to wear or loss of the original bolts, be sure to use bolts that are 1.10"–1.57" (28–40 mm) long.

Standard drum head tuning method

The standard method for tuning a drum head for the WAVEDRUM is described below. After replacing the drum head, you must tune it in the following way.

When using this tuning method, start with the tension bolts completely loosened.

1. Using the included tuning key, tighten each tension bolt, skipping one bolt each step. Be sure to use only light force to turn the bolt, and stop when the bolt stops turning (i.e., at the point that strength would be required). Do this for all five bolts.
2. Tighten each tension bolt one full turn, skipping one bolt each step. Do this for all five bolts.
3. Tighten each tension bolt approximately 45 degrees, skipping one bolt each step. Do this for all five bolts.

4. Strike the outer edge of the head to check whether the head is tensioned evenly. If necessary, make fine adjustments to the tension.

note: After tuning, calibrate the head, rim, and pressure sensors, and adjust the sensitivity as desired (*See page 29*).

Calibration

Calibrating the WAVEDRUM is a process of adjusting the reference values and sensitivity to ensure that it will respond accurately, given the head tension and the state of the rim.

You should perform the calibration procedure if the WAVEDRUM does not respond accurately to pressure etc., or after you've tuned or replaced the drum head. You should also perform the calibration again if sound produced by other instruments makes the WAVEDRUM resonate to cause feedback or inappropriately trigger the drum sound.

Calibrating the head sensor

Here's how to calibrate the head sensor that responds when you strike the head.

1. Hold down the BANK/MODE button and press button 4 to enter Global mode.
2. Press the BANK/MODE button (several times) to make the display indicate H.cA (Head Calibration).
3. Press button 1 to make the display indicate Lo and the value.
4. Turn the VALUE knob to adjust the value so that your normal light strikes produce sound. As you raise this value, you'll need to strike harder in order to produce sound.
5. Press button 2 to make the display indicate SEn and the value.
6. Turn the VALUE knob to adjust the value so that the normal dynamic range of your strikes produces the appropriate change in the sound. As you raise this value, the sensitivity will become coarser.
7. Save the setting. Press the WRITE button twice. For details on saving, refer to *page 9*.

Calibrating the rim sensor

Here's how to calibrate the rim sensor that responds when you strike the rim.

Follow the procedure above, but choose r.cA (Rim Calibration) and adjust the sensitivity appropriately for the rim.

Calibrating the pressure sensor

Here's how to calibrate the pressure sensor that response when you apply pressure to the head.

1. Hold down the BANK/MODE button and press button 4 to enter Global mode.
2. Press the BANK/MODE button (several times) to make the display indicate P.cA (Pressure Calibration).
3. Press button 1 to make the display indicate VAL (Value) and the value.
4. Verify that the pressure sensor is set to an appropriate height. If either of the following situations apply, you must readjust the pressure sensor to an appropriate height.

- ***If the sensor value indication is other than 0,*** the distance between the head and the sensor is too little, so the sensor must be lowered.

  a. Insert the included Allen wrench into the sensor height adjustment screw, position the WAVEDRUM horizontally, and while watching the display, turn the wrench slowly counter-clockwise as seen from above, until the value is 0.

  b. After the value reaches 0, turn the wrench an additional 45 degrees.

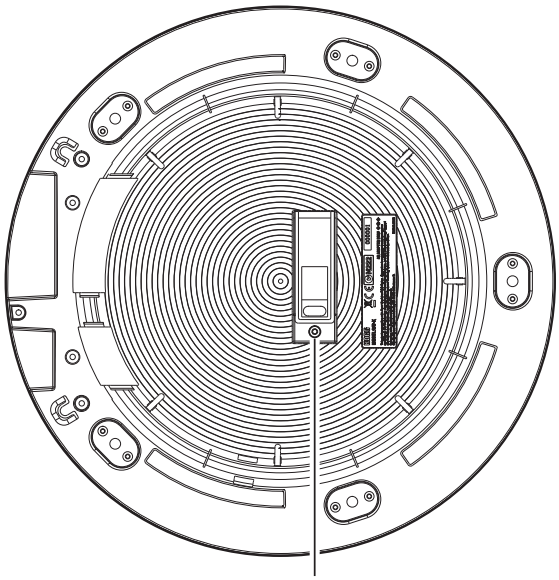
- ***If the sensor value indication is 0,*** but the WAVEDRUM is not responsive to pressure, the distance between the head and the sensor is too great, so the sensor must be raised.

  a. Insert the included Allen wrench into the sensor height adjustment screw, position the WAVEDRUM horizontally, and while watching the display, turn the wrench slowly clockwise.

  b. When the sensor value indication is no longer 0, stop turning the wrench, and now turn the wrench in the opposite direction (counter-clockwise).

  c. After the sensor value indication reaches 0, turn the wrench an additional 45 degrees.

5. With the pressure sensor adjusted to an appropriate height, apply pressure to the head, and verify that the effect produced by pressure is within the desired range (minimum and maximum values). The current value is displayed when you press the head.
6. Press button 2 to make the display indicate P.Lo and the value, and use the VALUE knob to specify the minimum value.
7. Press button 3 to make the display indicate P.Hi and the value, and use the VALUE knob to specify the maximum value.
8. Save the setting. Press the WRITE button twice. For details on saving, refer to *page 9*.



Sensor height adjustment screw

The WAVEDRUM's bottom

Error messages

When you turn on the power, the WAVEDRUM will automatically perform an internal check. If a problem is found, one of the following error messages is shown. Take the appropriate action listed here.

E.00: The pressure sensor value is invalid. Calibrate the pressure sensor so that VAL (Value) is 0. *See page 29*

E.01: The user data has been lost. Initialize the data as described in "Restoring the factory settings." *See page 28*

E.10: The pressure sensor has malfunctioned. Make sure that your hand or another object is not resting on the head. If any object is resting on the head, remove it, and then turn the power off and on again. If the same indication still appears, press any one of the buttons to start up the WAVEDRUM, and then calibrate the pressure so that VAL (Value) is 0. If you are unable to adjust the value to 0, please contact your nearby Korg dealer. *See page 29*

E.11: A system error has occurred. Stop using the WAVEDRUM, and contact your nearby Korg dealer.

Troubleshooting

Sound is different than another WAVEDRUM

As is the case for many other instruments, each individual WAVEDRUM will differ slightly depending on how it is tuned, the conditions how it is played, and how it has been maintained.

This means that even if the same heads are installed on several WAVEDRUMs and the same program settings are used, they may not necessarily produce identical sounds when played.

In other words, the WAVEDRUM is an electronic musical instrument that also has some characteristics of an acoustic instrument.

The sound of another instrument causes the WAVEDRUM to resonate and be triggered unintentionally

You may be able to prevent this by calibrating the head. *See page 29*

Feedback occurs

Consider using an equalizer or limiter of your PA system to prevent feedback and protect the amp and speaker system. *See page 3*

You may be able to prevent this by calibrating the head. *See page 29*

Does not respond to pressure applied to the head

Could the drum head be stretched too tightly? If the head is too tight, the pressure sensor will not work correctly. You may be able to fix this by tuning the head appropriately. *See page 28*

Performing the pressure calibration may make the sensor respond correctly. *See page 29*

No sound from the device connected to the AUX IN jack

Have you appropriately raised the AUX IN jack's mix level in Global mode? *See page 15*

Is the volume of the connected device turned up? *See page 6*

Are the connections correct? Is the power turned on? *See page 6*

Specifications

Dynamic Percussion Synthesizer

Algorithms: Single-size 26, Double-size 10

PCM instruments: Head 100, Rim 100

Programs: 200 (User 100, Preset 100)

Loop phrase: 100

Effect: Reverb, Delay

Controls: VOLUME knob, WRITE button, Buttons 1 - 4, BANK/MODE button, VALUE knob

Input/Output jacks: Output L, R (Monaural phone jack), Phones (Stereo mini phone jack), AUX IN (Stereo mini phone jack)

Display: 3-character 7-segment LED

Sampling frequency: 48 kHz

A/D, D/A conversion: 24 bit

Power supply: DC9V 1.7A

Dimensions (WxDxH): 344×349×75 mm / 13.54"x13.74"x2.95"

Weight: 2.0 kg / 4.41 lbs.

Included items: AC Adapter, Tuning key, Allen wrench

Options: Replacement Head HD-WD, Percussion Stand ST-WD

* Specifications and appearance are subject to change without notice for improvement.

Index

Symbols

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WAVEDRUM

Owner's Manual

IMPORTANT NOTICE TO CONSUMERS

This product has been manufactured according to strict specifications and voltage requirements that areapplicable in the country in which it is intended that this product should be used. If you have purchased thisproduct via the internet, through mail order, and/or via a telephone sale, you must verify that this product isintended to be used in the country in which you reside. WARNING: Use of this product in any country other than that for which it is intended could be dangerousand could invalidate the manufacturer's or distributor's warranty. Please also retain your receipt as proof of purchase otherwise your product may be disqualified from themanufacturer's or distributor's warranty.

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KORG

E 2