

***Pioneer Dj***

**Analog Synthesizer**

**TORAIZ AS-1**

**TAS-1**

**<http://pioneerdj.com/support/>**

The Pioneer DJ site shown above offers FAQs, information on software, and various other types of information and services to allow you to use your product better.

**Operating Instructions**

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# Contents

## How to read this manual

Thank you for buying this Pioneer DJ product.

Be sure to read this manual and the "Operating Instructions" (Quick Start Guide) included with this unit. Both documents include important information that you should understand before using this product.

- In this manual, the names of buttons, controls and terminals indicated on the product, and program options appearing on the unit display, etc., are indicated within square brackets ([ ]). (e.g. [GLOBAL] button, [PHONES] terminal, [OSCILLATOR 1])
- Please note that the screens and specifications of the software described in this manual as well as the external appearance and specifications of the hardware are currently under development and may differ from the final specifications.
- Please note that depending on the operating system version, web browser settings, etc., operation may differ from the procedures described in this manual.

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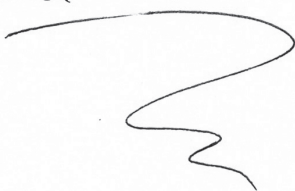
# A message from Dave Smith

After a great experience working with Pioneer DJ on their awesome TORAIZ SP-16, we decided to continue the partnership with a second product:

TORAIZ AS-1 Analog Monosynth 0

Based on the Prophet-6 voice, it's old-school synthesis that fits nicely in a modern DJ rig, and it's an ideal stand-alone synth for quick access to classic analog sounds.

Have fun with the synth 0

Dave Smith  


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# Before starting

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## Features

The TORAIZ AS-1 is a fully programmable monophonic analog synthesizer that features discrete analog filters based on the acclaimed Prophet-6 polyphonic synthesizer designed by Dave Smith Instruments LLC. Its built-in 64-step sequencer and extensive library of preset sounds make it an inspiring and expressive musical tool. And its easy-to-use control panel packs a tremendous amount of sound-creation power and versatility into a compact, robust metal chassis that is equally suited to studio or stage.

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### Analog synthesizer circuit

The synthesizer circuitry of the TORAIZ AS-1 is based on the Prophet-6, and was developed in cooperation with Dave Smith Instruments LLC. The 4-pole, resonant low-pass filter gives the TORAIZ AS-1 the same unique analog punch as the Prophet-6 and also provides it with powerful tone-shaping and self-resonating capabilities.

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### Fully programmable synthesizer engine

All sounds can be saved as presets and accessed instantly in the studio or on stage. Synthesizer parameters are clearly displayed in the high-resolution OLED.

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### Extensive library of preset sounds

The factory presets are designed to cover a broad variety of musical styles and genres. You can use them as is, or edit and save them according to your preference.

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### 64 step-sequencer and arpeggiator

The TORAIZ AS-1's step-sequencer and arpeggiator are great tools for phrase making and live performances. Since the 64-step sequencer is capable of step input, you can instantly store the phrase you have just come up with. Furthermore, you can change the sound rhythm and key of the phrase made with the 64-step sequencer and arpeggiator in real time, which will inspire you to create new phrases.

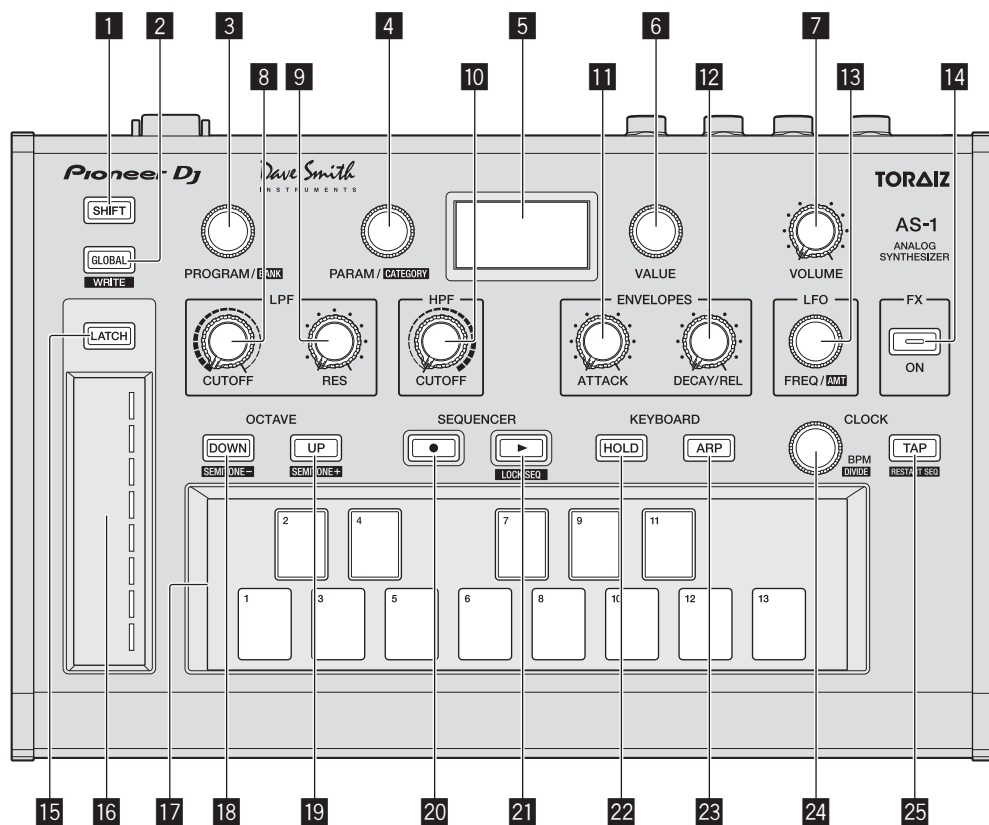
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### Intuitive interface and professional-quality design

All TORAIZ AS-1 controls are arranged for easy, control-panel access in much the same way as on DJ gear. This allows you to quickly and easily tweak sounds in real time. And because it is compact and constructed with a robust metal chassis, you can safely take it anywhere for music production and live performance.

# Part names and functions

## Control panel



### 1 SHIFT button

If a button has two functions, you can toggle between them by turning the **[SHIFT]** button ON or OFF.  
To turn on the **[SHIFT]** button, press and hold it so that it lights up. To turn off the **[SHIFT]** button, just release it so that the light goes off.  
See “Choosing and playing a program” (page 9).

### 2 GLOBAL button

Switches to global settings mode.  
See “Changing the unit settings ([GLOBAL SETTING])” (page 21).

### 3 PROGRAM/BANK control

Switches programs.  
To switch between categories, turn on the **[SHIFT]** button before you turn the control.  
See “Choosing and playing a program” (page 9).

### 4 PARAM/CATEGORY control

Selects the parameter to be adjusted.  
To switch between categories, turn on the **[SHIFT]** button before you turn the **[PARAM/CATEGORY]** control.  
See “Editing a program” (page 9).

### 5 Display

Displays bank number, program number, program name, parameters, etc.  
See “Choosing and playing a program” (page 9).

### 6 VALUE control

Adjusts the parameter/menu setting appearing in the display.  
See “Editing a program” (page 9).

### 7 VOLUME control

Adjusts the audio output level.  
See “Volume” (page 17) and “No sound or low sound” (page 37).

The volume of **[AUDIO OUT]** and **[PHONES]** output are linked. When playing using headphones, be careful not to raise the volume too much.  
Depending on the **[VOLUME]** control setting, stimulusly loud sounds may occur when you play the keyboard.

### 8 LPF CUTOFF control

Adjusts the cutoff frequency of the LPF (low-pass filter).  
See “FILTER category” (page 13).

### 9 LPF RESONANCE control

Adjusts the resonance of the LPF (low-pass filter).  
See “FILTER category” (page 13).

### 10 HPF CUTOFF control

Adjusts the cutoff frequency of the HPF (high-pass filter).  
See “FILTER category” (page 13).

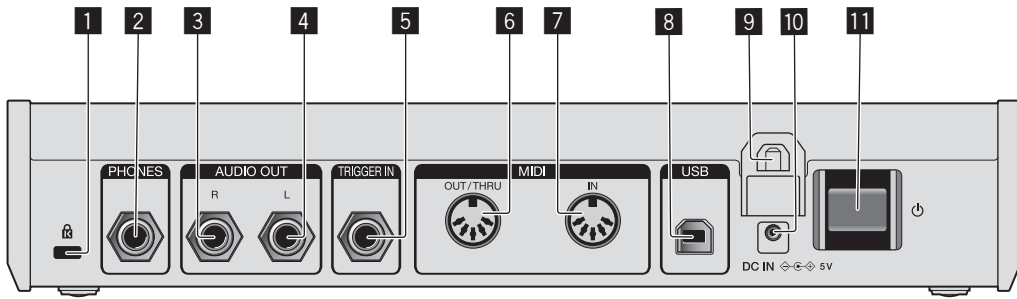
### 11 ENVELOPE ATTACK control

Adjusts the attack of the amplifier envelope and the filter envelope.  
See “FILTER ENVELOPE category” (page 13).

### 12 ENVELOPE DECAY/RELEASE control

Adjusts the decay and release of the amplifier envelope and the filter envelope.  
See “FILTER ENVELOPE category” (page 13).

- 13 LFO FREQ/AMOUNT control**  
Adjusts the frequency of the LFO (Low Frequency Oscillator).  
See "LFO (Low Frequency Oscillator) category" (page 14).  
To adjust the amount of the LFO, turn on the **[SHIFT]** button before you turn the **[LFO FREQ/AMT]** control.  
See "SLIDER category" (page 15).
- 14 FX ON/OFF button**  
Turns the effect On/Off.  
See "EFFECTS category" (page 16).
- 15 LATCH button**  
Holds the effect of the slider.  
See "Using the slider" (page 11).
- 16 Slider**  
Adjusts the effect of the slider.  
See "Using the slider" (page 11).
- 17 Keyboard**  
Use the keyboard to play the currently selected sound.  
See "Choosing and playing a program" (page 9).
- 18 OCTAVE DOWN button**  
Lowers the keyboard's playing range an octave.  
To lower it in semitone steps, turn on the **[SHIFT]** button before you press the **[OCTAVE DOWN]** button.  
See "Choosing and playing a program" (page 9) and "OSCILLATOR category" (page 12).
- 19 OCTAVE UP button**  
Raises the keyboard's playing range an octave.  
To raise it in semitone steps, turn on the **[SHIFT]** button before you press the **[OCTAVE DOWN]** button.  
See "Choosing and playing a program" (page 9) and "OSCILLATOR category" (page 12).
- 20 SEQUENCER record button**  
Puts the sequencer in the recording state.  
See "Using the sequencer" (page 10).
- 21 SEQUENCER play button**  
Plays the sequence.  
See "Using the sequencer" (page 10).
- 22 HOLD button**  
Turns On/Off the keyboard hold function.  
See "Choosing and playing a program" (page 9) and "ARPEGGIATOR category" (page 18).
- 23 ARP button**  
Turns the arpeggiator function On/Off.  
See "Choosing and playing a program" (page 9) and "ARPEGGIATOR category" (page 18).
- 24 CLOCK BPM/DIVIDE control**  
Adjusts BPM.  
To adjust the tempo of the sequencer/arpeggiator, turn on the **[SHIFT]** button before you turn the **[CLOCK BPM/DIVIDE]** control.  
See "ARPEGGIATOR/SEQUENCER category" (page 18).
- 25 CLOCK TAP button**  
Tap the **[CLOCK TAP]** button with your finger to set the BPM.  
See "ARPEGGIATOR/SEQUENCER category" (page 18).



**1 Kensington lock slot**

**2 PHONES output**

Connect headphones.

**3 AUDIO OUT R**

Connect to an analog input terminal (right) of a power amplifier, mixer, etc.

**4 AUDIO OUT L**

Connect to an analog input terminal (left) of a power amplifier, mixer, etc.

**5 TRIGGER IN**

Connect a foot switch or a device that sends an audio signal to be a trigger signal.

For detailed operational specifications of this terminal, see "Changing the unit settings ([GLOBAL SETTING])" (page 21).

**6 MIDI OUT/THRU**

Connect to a device that receives MIDI signals from this unit.

**7 MIDI IN**

Connect to a device that sends MIDI signals to this unit.

**8 USB-B terminal**

Connect to your computer.

- USB hubs cannot be used.
- To optimize performance, connect this unit and computer directly with a USB 2.0 compliant USB cable.

**9 Cable hook**

Connect the AC adapter cable here to prevent accidental disconnection. See "How to use the cable hook" (page 8).

**10 DC IN terminal**

Connect the AC adapter cable here.

**11 Power button**

Turns the power of this unit On/Off.

This switch is between off and on for this product.

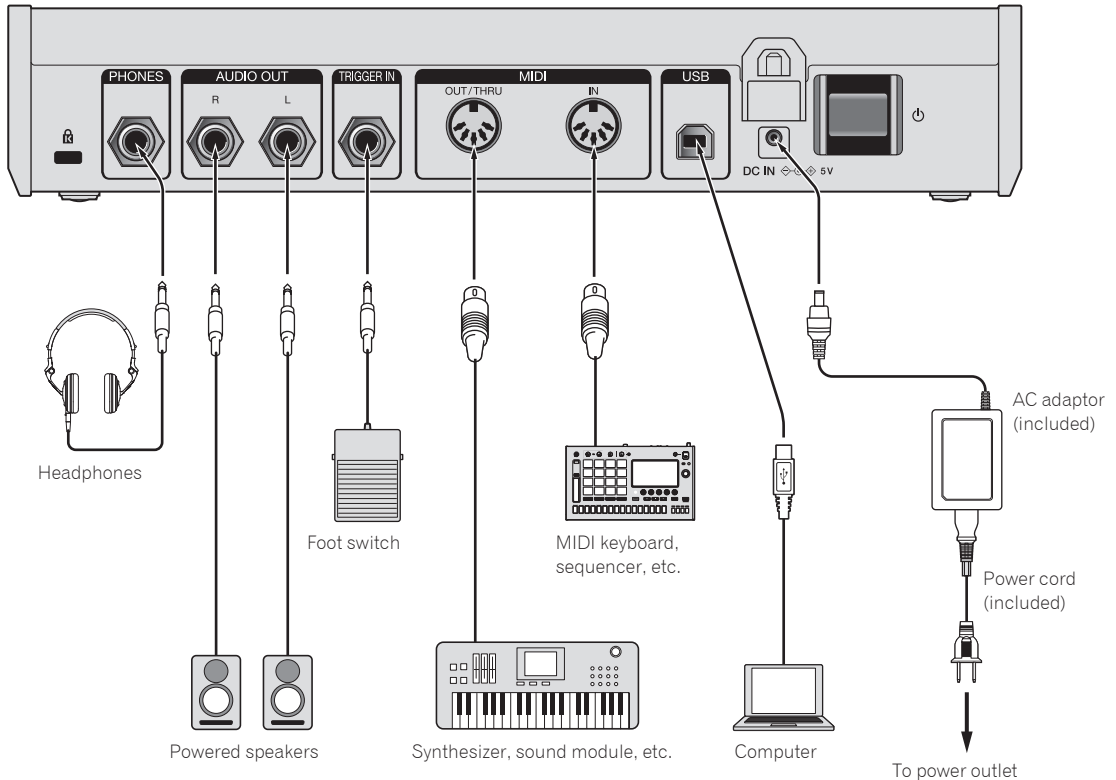
**Caution**

Even if you turn off the unit by operating the switch/button of the unit or remote control (if supplied) and the display goes out and the unit looks like the same way as the unit being unplugged from the power, the power is still supplied to the unit according to this product specifications. To completely shut down the power supply, disconnect the plug (shut-off device) of the power cord. In order to easily do so, set up the unit near the power outlet so that you can access the power cord plug (shut-off device) without difficulty. Keeping the unit plugged in the power outlet for an extended period of time may cause a fire.

# Connections

- Be sure to turn off the power and unplug the power cord from the power outlet whenever making or changing connections.
- Connect the power cord after all the connections between devices have been completed.
- Be sure to use the included power cord and AC adaptor.
- Refer to the operating instructions for components to be connected.
- Connect this unit and your computer directly using a USB cable.
  - Use a USB cable which conforms to USB 2.0.
  - USB hubs cannot be used.

## Connecting inputs and outputs

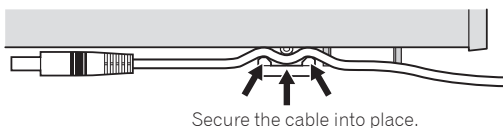


### How to use the cable hook

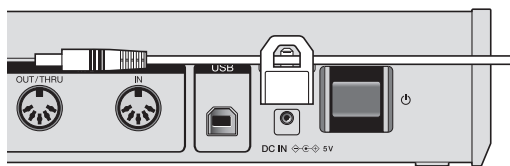
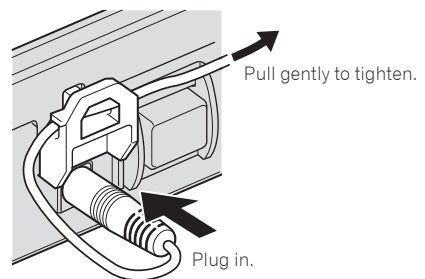
Connect the AC adaptor cable to the cable hook to prevent accidental disconnection.

- If the AC power adaptor cable is unplugged while you are playing the synthesizer, the sound will stop abruptly.

#### 1 Fit the connection cable of the AC adaptor into the cable hook.



#### 2 Connect the plug of the connection cable to the [DC IN] terminal. If the cable on the left side of the cable hook is too long, tighten it moderately.





# Operation

This chapter explains how to operate the unit from sound creation to playing.

For details on the categories, parameters and parameter values described in the operating procedures, see "Creating sounds and categories/parameters" (page 12).

## Choosing and playing a program

The TORAIZ AS-1 has ten banks ([F1]-[F5] and [U1]-[U5]) each of which stores 99 programs. To recall the desired program, select a bank and a program number in that order.

- The programs in the banks [F1]-[F5] are read-only and the programs in the banks [U1]-[U5] are rewritable. Though you can edit any program in any bank, you can only save a program to a user bank [U1]-[U5]. ("F" represents "Factory bank" and "U" represents "User bank.")
- When you purchase this product, the programs in the banks [U1]-[U5] are identical to the programs in the banks [F1]-[F5].

### About the last memory function

By selecting a program and pressing the [GLOBAL/WRITE] button twice (press the [GLOBAL/WRITE] button to display the [GLOBAL SETTING] screen and again press the [GLOBAL/WRITE] button to return to the main screen), the selected program will be displayed first on the main screen next time you turn on the unit.

### 1 Press the [⏻] button on the rear panel to turn on the unit.

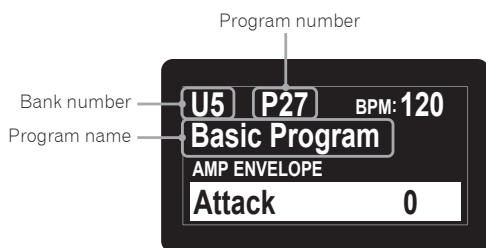
The main screen appears in the display.

### 2 Turn on the external devices connected to the [AUDIO OUT] (e.g. powered speakers, power amplifier, audio mixer, etc.).

### 3 Press and hold the [SHIFT] button and turn the [PROGRAM/BANK] control to select a bank number.

The bank number in the display changes when you turn the control.

- If you press and hold the [SHIFT] button, it turns On only while you are pressing the button. To turn it off, simply release the button.



### 4 Turn off the [SHIFT] button and turn the [PROGRAM/BANK] control to select the desired program.

The program number and program name in the display change when you turn the control.

### 5 Play the keyboard.

The synthesizer plays the corresponding sound.

- If the [HOLD] button is On (lit), the sound plays continuously. Each press of the [HOLD] button turns it On or Off in turn.
- If the [ARP] button is On (lit), any held notes are arpeggiated. Each press of the [ARP] button turns it On or Off in turn.
- If you press the [OCTAVE UP] button/[OCTAVE DOWN] button while performing the arpeggio play, you can raise/lower the scale by an octave. To raise/lower in chromatic scale units, press and hold the [SHIFT] button and press either button.

## Editing a program

There are two ways to edit a program.

- Use the controls and buttons of the control panel to directly adjust the main parameters (as shown in step 2 below).
- Choose the desired parameter shown in the display and adjust the detailed parameters (as shown in steps 3 to 5 below).

For the operations of the buttons and controls, see "Part names and functions" (page 5) and for details of the parameters, see "Creating sounds and categories/parameters" (page 12).

### 1 Choose a program you wish to edit.

Follow steps 3 and 4 in "Choosing and playing a program" above.

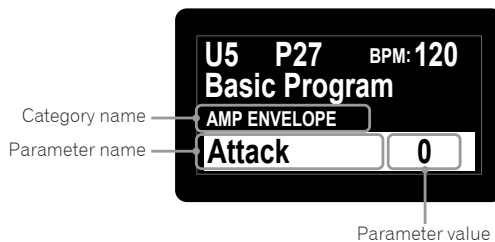
### 2 Operate the [LPF CUTOFF], [LPF RES], [HPF CUTOFF], [ENVELOPE ATTACK], [ENVELOPE DECAY/REL], [LFO FREQ/AMT] controls and/or [FX] button.

The sound changes as you adjust the parameter.

### 3 Press and hold the [SHIFT] button and turn the [PARAM/CATEGORY] control to choose the desired category.

The category name in the display changes when you turn the control.

- See step 3 in "Choosing and playing a program" above for how to turn on/off the [SHIFT] button.



### 4 Turn off the [SHIFT] button and turn the [PARAM/CATEGORY] control to choose the desired parameter name.

The parameter name in the display changes when you turn the control.

### 5 Turn the [VALUE] control to adjust the parameter value.

The sound changes as you adjust the parameter value shown in the display.

## Saving an edited program

### 1 Press and hold the [SHIFT] button and press the [GLOBAL/WRITE] button.

The following screen appears in the display and the [GLOBAL/WRITE] button flashes. (The [SHIFT] button turns off automatically.)

- See step 3 in "Choosing and playing a program" above for how to turn on/off the [SHIFT] button.

**U5 P27**  
**Basic Program**  
**Press Write to Save**  
**or Hold to Cancel**

**2 If you wish to change the program name, turn the [PARAM/CATEGORY] control to select the character to be changed and turn the [VALUE] control to select the desired character.**

- You can choose from alphanumeric characters, symbols and a blank.
- If you do not change the program name, this step is not necessary.

**3 Press the [GLOBAL/WRITE] button again.**

The currently selected program is overwritten by the edited program.

- To cancel saving, press the [HOLD] button instead of the [GLOBAL/WRITE] button. The display returns to the main screen without saving the edited program.

## Initializing a program to create a sound from scratch

When you wish to create a sound from scratch, you can use the “basic program,” which is a simple, single-oscillator sound. To do this, select a program and initialize it. You can then use this as a starting point for sound creation.

**1 Select a program you wish to initialize.**

- Follow steps 3 and 4 in “Choosing and playing a program” (page 9).

**2 Turn off the [SHIFT] button, and press the [GLOBAL/WRITE] button.**

The [GLOBAL SETTING] screen appears in the display and the [GLOBAL/WRITE] button lights up.

- See step 3 in “Choosing and playing a program” (page 9) for how to turn on/off the [SHIFT] button.

**3 Turn the [PARAM/CATEGORY] control until the [Basic Program] screen appears in the display.**

When the [Basic Program] is selected, the [LATCH] button flashes.

**23. Basic Program**  
**Press Latch to**  
**Load Basic Patch**

**4 Press the [LATCH] button.**

The currently selected program is initialized and the display returns to the main screen.

- To create a sound, follow steps 2 to 5 in “Editing a program” (page 9).  
 For details such as parameter settings, see “Creating sounds and categories/parameters” (page 12).
- To cancel initializing, press the [GLOBAL/WRITE] button again instead of the [LATCH] button. The display returns to the main screen without initializing the program.

## Using the sequencer

This unit can create up to 64-step sequence patterns for each program.

### Performing step recording

**1 Press the [SEQUENCER record] button.**

The [Record] screen appears in the display and the unit enters step recording mode.

**Record** **BPM: 120**  
**Note:--** Hit HOLD to Tie  
**Vel:--** Hit ARP to Rest  
**SHIFT + HOLD sets Slew: Off**

**2 Touch one of the keyboard keys.**

The corresponding note is entered into a step, and the unit automatically proceeds to the next step.

- Up to 64 steps can be entered.
- To enter a tie, press the [HOLD] button. When a note is tied, the sound of the note you entered in the previous step plays continuously.
- To enter a rest, press the [ARP] button.
- To switch [On]/[Off] of [Slew] of the step shown in the display, press and hold the [SHIFT] button and press the [HOLD] button.  
 For how to turn on/off the [SHIFT] button, see step 3 in “Choosing and playing a program” (page 9).

**3 Press the [SEQUENCER record] button.**

The step recording ends.

- If you press the [SEQUENCER play] button while the unit is in step recording state, it allows you to start sequencer playback as soon as the step recording ends.

**4 Press the [SEQUENCER play] button.**

Playback of the entered sequence starts.

- If you touch a key of the keyboard while playing the sequence, the pitch of the sequence shifts according to the scale of the key.
- To switch On/Off of [LOCK SEQUENCE], press and hold the [SHIFT] button and press the [SEQUENCER] button.
  - On: When you start playback of the sequence, the [SEQUENCER play] button flashes. Even if you change the program, the sequence pattern when [LOCK SEQUENCE] is switched On is maintained.
  - Off: When you start playback of the sequence, the [SEQUENCER play] button lights up. When you change the program, the sequence pattern also changes to the corresponding one.
- If you press and hold the [SHIFT] button and press the [TAP] button while playing the sequence, the sequence jumps to the first step (restarts).

### Changing the number of steps you want to play

**1 Turn the [PARAM/CATEGORY] control to display the [Length] parameter screen in the [SEQUENCER] category.**

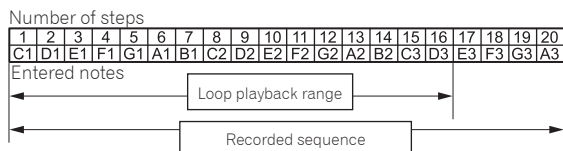
**U5 P27** **BPM: 120**  
**Basic Program**  
**SEQUENCER**  
**Length 64 Steps**

## 2 Turn the [VALUE] control to change the number of steps to be played back.

The unit plays the sequence repeatedly (loop playback) according to the number of steps shown in the display.

- To change the number of steps, hold down the [SHIFT] button and turn the [VALUE] control.
- If you select [Length] less than the number of steps of the recorded sequence, the playback forcibly returns to the first step after playing the step specified by [Length].  
Example: When the number of steps in the recorded sequence is 20 and [Length] is set to [16 steps].

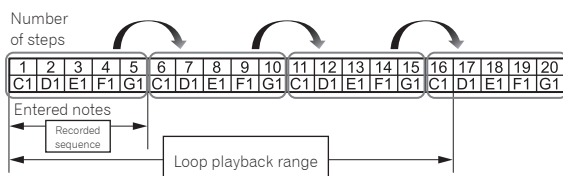
Step number



The unit loops playback until the 16th step. Steps 17 to 20 are not played, but the sequence pattern remains.

- If you select [Length] greater than or equal to the number of steps of the recorded sequence, the unit plays the sequence pattern repeatedly until it reaches [Length], then returns to the first step for loop playback.

Example: When the number of steps of the recorded sequence is five and [Length] is set to [16 steps].



The unit plays the recorded five-step sequence pattern repeatedly until the 16th step, then it forcibly returns to the first step to loop playback.

- If you change the [Length] setting while playing a sequence, the change will be reflected after the step specified by the previous [Length] setting is played.

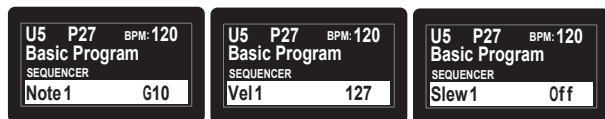
## Changing the entered note setting

Each step has the following settings: [Note], [Vel], [Slew].

1 Turn the [PARAM/CATEGORY] control to display the [Note], [Vel] or [Slew] parameter screen under the [SEQUENCER] category of the step you wish to change.

2 Turn the [VALUE] control to change the value of the displayed parameter.

Changes in each parameter value are reflected instantly, regardless of the playback/stop status of the sequence.



## Using the slider

You can assign multiple parameters to the slider and dynamically change the tone using the slider.

1 Turn the [PARAM/CATEGORY] control and choose the parameter you wish to change using the slider from the [SLIDER DESTINATION] category.

2 Turn the [VALUE] control to set the maximum value of the parameter assigned to the slider.

3 Operate the slider.

- To make the slider hold its value even after you release your finger, press the [LATCH] button so that the [LATCH] button turns on (lights up).

## Using the Quick Program function

The unit can assign up to 13 programs as Quick Programs to each keyboard key and instantly recall them.

### Assigning quick programs to the keyboard keys

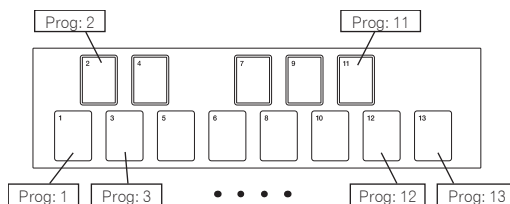
1 Press the [GLOBAL/WRITE] button.

The [GLOBAL SETTING] screen appears in the display.

2 Turn the [PARAM/CATEGORY] control to display the [Quick Program] screen.

3 Turn the [VALUE] control to select a key to which you wish to assign the quick program.

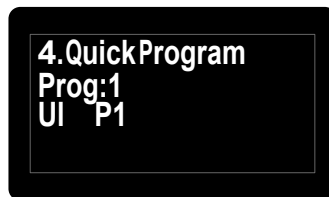
The numbers [Prog: 1] to [Prog: 13] correspond to the numbers on the keyboard keys.



4 Press and hold the [SHIFT] button and turn the [PROGRAM/BANK] control to select the bank number that contains the program you wish to assign.

The bank number in the display changes.

- See step 3 in "Choosing and playing a program" (page 9) for how to turn on/off the [SHIFT] button.



5 Turn off the [SHIFT] button and turn the [PROGRAM/BANK] control to select the desired program to assign to the selected key.

The program number in the display change.

### Recalling the assigned Quick Programs

1 Press and hold the [SHIFT] and [LATCH] buttons and touch the desired key.

This instantly switches to the program assigned in "Assigning quick programs to the keyboard keys" above.

# Creating sounds and categories/ parameters

This chapter explains the synthesis categories and parameters included in the program for creating sounds. For details for how to change the categories, parameters and parameter values described here, see "Operation" (page 9).

## OSCILLATOR category

The oscillator categories ([OSCILLATOR 1], [OSCILLATOR 2] and [OSCILLATORS]) generate waveforms with various harmonic configurations that form the basis of the sounds of this unit.

The unit has the two oscillators (Oscillator 1, Oscillator 2) and in addition, a sub-oscillator of Oscillator 1 and an independent noise generator.

Each of the two oscillators is capable of generating triangle, sawtooth, and variable-width pulse waves. You can also continuously change these three types of waveforms using the [Shape] parameter.

## OSCILLATOR parameters

[OSCILLATOR 1], [OSCILLATOR 2] and [OSCILLATORS] are displayed as categories in the display.

The following are the parameters displayed under one or two of the categories.

### Frequency

(Both the [OSCILLATOR 1] and [OSCILLATOR 2] categories have this parameter.)

The [Frequency] parameter adjusts the basic pitch of the oscillator over a range of five octaves.

- If you use the [OCTAVE UP] and [OCTAVE DOWN] buttons, the range is nine octaves total.

### Shape

(Both the [OSCILLATOR 1] and [OSCILLATOR 2] categories have this parameter.)

The [Shape] parameter adjusts the waveform generated by the oscillator. The waveform can change from triangular wave, sawtooth wave and pulse wave continuously.

The three waveforms appear in the display as follows.

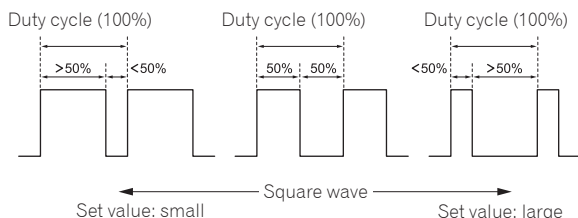
- Triangular wave: [Tri]
- Sawtooth Wave: [Saw]
- Pulse wave: [Pulse]

### Pulse Width

(Both the [OSCILLATOR 1] and [OSCILLATOR 2] categories have this parameter.)

The [Pulse Width] parameter adjusts the pulse width of the pulse wave.

- When [Pulse Width] is set to [127], the pulse wave becomes a square wave (pulse width: 50%).
- When [Pulse Width] is set to [0] or [255], the duty ratio of the pulse wave becomes 0% (pulse width: 0%), so the sound is not output.



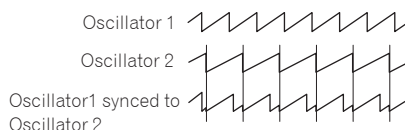
### Sync

(For [OSCILLATOR 1] category)

The [Sync] parameter sets the oscillator hard sync to [On]/[Off].

When the oscillator hard sync is set to [On], it forces Oscillator 1 to restart its cycle every time Oscillator 2 starts its cycle. This adds

harmonic overtones to the Oscillator 1 frequency, making a complex waveform.



### Fine

(For [OSCILLATOR 2] category)

Fine tunes the pitch of Oscillator 2 up or down a quartertone. Slightly detuning the pitches of Oscillator 1 and Oscillator 2 creates a thicker sound.

### Key Follow

(For [OSCILLATOR 2] category)

Set [Key Follow] to [On]/[Off].

When [Key Follow] is [On], the pitch of Oscillator 2 is controlled by the keyboard.

- When using Oscillator 2 as an LFO (Low Frequency Oscillator) source, it will continue to transmit at the frequency set in [Frequency] by setting [Key Follow] to [Off].
- Even if [Key Follow] is set to [Off], modulations from other modulation sources are enabled.

### Low Freq

(For [OSCILLATOR 2] category)

When [Low Freq] is set to [On], Oscillator 2 can be used as an LFO.

### Slop

(For [OSCILLATORS] category)

This parameter affects both Oscillator 1 and Oscillator 2.

Slop adds randomized detuning to both oscillators, giving the unit the kind of slight tuning instability and "warmth" found on vintage analog synthesizers.

- Small amounts of Slop will create a subtle vintage analog character. Larger amounts will produce a more dramatically out-of-tune effect.

## MIXER category

In the [MIXER] category, you can set the levels of the individual oscillators.

To synthesize the waveform of each oscillator, you need to raise the volume level of each parameter in the [MIXER] category.

- If the low-pass filter's [RESONANCE] parameter is set high enough to cause self-oscillation, the filter will produce a sine wave, even if all the oscillators' volumes are set to [0].

## MIXER parameters

### Osc1 Level

Sets the volume of Oscillator 1.

### Osc2 Level

Sets the volume of Oscillator 2.

### Sub Level

Sets the volume of the sub oscillator of Oscillator 1.

The sub oscillator generates a triangle wave that is one octave lower than the pitch of Oscillator 1. Because a triangle wave has very few harmonics, you can use the triangle sub octave to add weight to a sound without changing its overall harmonic content.

### Noise Level

Sets the volume of the white noise generated by the noise generator. Noise is effective for making percussive sounds and sound effects such as wind or ocean waves.

## FILTER category

In the filter category (**[LOW-PASS FILTER]**, **[HIGH-PASS FILTER]**), the tone is processed by cutting or emphasizing the harmonic component of the Oscillators.

This unit is equipped with a 4-pole (24 dB per octave) analog resonant low-pass filter and a 2-pole (12 dB per octave) analog resonant high-pass filter.

The low-pass filter attenuates the high frequencies, and the high-pass filter attenuates the low frequencies. By using these two filters at the same time, it also functions as a bandpass filter.

Also, you can emphasize a band of frequencies near the filter cutoff by adjusting the resonance (**[Resonance]**) level.

### FILTER parameters

**[LOW-PASS FILTER]** and **[HIGH-PASS FILTER]** are displayed as categories in the display.

The following are the parameters displayed under either or both categories.

#### Cutoff

(Both the **[LOW-PASS FILTER]** and **[HIGH-PASS FILTER]** categories have this parameter.)

The **[Cutoff]** parameter adjusts the cutoff frequency of each filter.

The cutoff frequency is adjusted to the lower range when the set value of the parameter decreases and to the higher range when it increases.

- As you decrease the value of the **[LOW-PASS FILTER]**, you remove the high frequencies in the sound.
- As you increase the value of the **[HIGH-PASS FILTER]**, you remove the low frequencies in the sound.
- The **[FILTER ENVELOPE]** allows you to control the filter's cutoff frequency over time.

#### Resonance

(Both the **[LOW-PASS FILTER]** and **[HIGH-PASS FILTER]** categories have this parameter.)

The **[Resonance]** parameter adds a distinctive character to the sound by emphasizing the overtones around the cutoff frequency.

- As the **[Resonance]** level is increased, the overtone component is emphasized and the effect increases.
- The low-pass filter starts self-oscillation by increasing the **[Resonance]** level, and the filter itself generates a sine wave.
- Setting **[Resonance]** to a high value when the Oscillators are also set to a high value in the **[MIXER]** can cause distortion. Reduce oscillator levels if necessary.

#### Key Amount

(Both the **[LOW-PASS FILTER]** and **[HIGH-PASS FILTER]** categories have this parameter.)

**[Key Amount]** controls how the filter cutoff frequency is affected by the keyboard. Settings are **[Off/Half/Full]**.

- When set to **[Full]**, the higher the note played on the keyboard, the more the filter opens. The cutoff frequency changes are in semitone units.
- When set to **[Half]**, the higher the note played on the keyboard, the more the filter opens. However, the cutoff frequency changes are in half-semitone units.
- When set to **[Off]**, playing higher or lower on the keyboard does not affect filter frequency.
- When the low-pass filter is self-oscillating, you can play according to the **[Key Amount]** setting in the **[LOW-PASS FILTER]** category as follows.

- When set to **[Full]**, you can play one octave twelve scale with the oscillation sound (sine wave) of the filter.
- When set to **[Half]**, you can play one octave twelve scale by playing the keyboard two octaves.

### Velocity

(Both the **[LOW-PASS FILTER]** and **[HIGH-PASS FILTER]** categories have this parameter.)

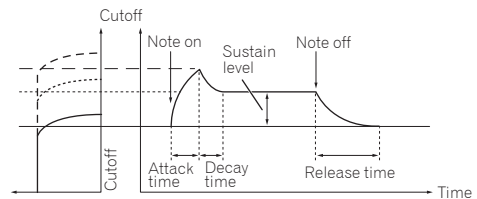
When the **[Velocity]** parameter is set to **[On]**, you can change the effect of the filter envelope (**[FILTER ENVELOPE]**) to the cutoff frequency depending on the velocity (strength of playing the keyboard).

- If you play the keyboard strongly, the amount of change in **[LP Amount]** and **[HP Amount]** in the **[FILTER ENVELOPE]** category will increase.

## FILTER ENVELOPE category

The **[FILTER ENVELOPE]** is used to control the cutoff frequencies of the two filters over time using the **[Attack]**, **[Decay]**, **[Sustain]**, and **[Release]** controls.

In general, sounds produced by an instrument are brighter at their beginning (the attack stage) and grow mellow as they die out (the decay and release stages). This is what the **[FILTER ENVELOPE]** is designed to simulate.



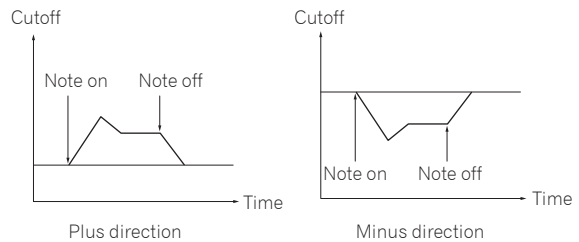
Standard ADSR envelope

### FILTER ENVELOPE parameters

#### LP Amount

The **[LP Amount]** parameter sets the amount of modulation from the filter envelope to the low-pass filter. Higher amounts more dramatically affect the cutoff frequency.

- Higher positive **[LP Amount]** settings cause the Filter Envelope to more dramatically affect the filter cutoff frequency.
- Higher negative **[LP Amount]** settings cause the Filter Envelope to be inverted and more dramatically affect the filter cutoff frequency in the reverse direction.



#### HP Amount

The **[HP Amount]** parameter sets the amount of modulation from the filter envelope to the high-pass filter. Higher amounts more dramatically affect the cutoff frequency.

- Higher positive **[HP Amount]** settings cause the Filter Envelope to more dramatically affect the filter cutoff frequency.
- Higher negative **[HP Amount]** settings cause the Filter Envelope to be inverted and more dramatically affect the filter cutoff frequency in the reverse direction.

## Attack

The **[Attack]** parameter sets the attack time of the filter envelope. This sets the length of time from note-on (pressing a key) until the filter opens to the frequency set using the **[Cutoff]** parameter.

- The larger the setting value of **[Attack]**, the longer it takes to reach the maximum value.

## Decay

The **[Decay]** parameter sets the decay time of the filter envelope. This sets the time to reach the sustain level, after reaching the cutoff frequency set in **[Cutoff]** through the attack stage.

- The larger the setting value of **[Decay]**, the longer the time to reach the sustain level becomes.

## Sustain

The **[Sustain]** parameter sets the sustain level of the filter envelope. This sets the cutoff frequency that is held while the sound is sustaining through the decay time (while you are pressing the keyboard).

- The larger the setting value of **[Sustain]**, the higher the sustain level.
- When **[Sustain]** is set to the maximum value, the **[Decay]** time has no effect.
- When **[Sustain]** is set to the minimum value, the **[Release]** time has no effect.

## Release

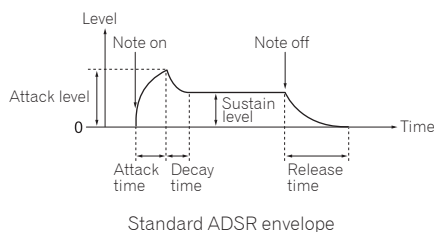
The **[Release]** parameter sets the filter envelope release time. This controls how quickly the filter closes after a note is released.

- The larger the setting value of **[Release]**, the longer the decay time until the filter closes.

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## AMP ENVELOPE category

The **[AMP ENVELOPE]** is used to control the overall loudness of a sound over time using the **[Attack]**, **[Decay]**, **[Sustain]**, and **[Release]** controls. In general, sounds produced by an instrument change volume over time. This is what the **[AMP ENVELOPE]** is designed to simulate.



Standard ADSR envelope

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## AMP ENVELOPE parameters

### Amount

The **[Amount]** parameter sets the attack level (the maximum value of the amplifier envelope) by the amplifier envelope.

### Velocity

When the **[Velocity]** is set to **[On]**, **[Amount]** of the amplifier envelope can be changed by velocity (how hard you strike).

- The stronger you play the keyboard, the greater the change of **[Amount]** (volume) becomes.

### Attack

The **[Attack]** parameter sets the attack time of the amplifier envelope. This sets the time from note-on (pressing a key) till it reaches the attack level set in **[Amount]** (how fast the rising time to the crest is).

- The larger the setting value of **[Attack]**, the longer it takes to reach the attack level.

### Decay

The **[Decay]** parameter sets the decay time of the amplifier envelope. This sets the time to reach the sustain level, after reaching the attack level.

- The larger the setting value of **[Decay]**, the longer the time to reach the sustain level becomes.

### Sustain

The **[Sustain]** parameter sets the sustain level of the amplifier envelope. This sets the volume that is held while the sound is sustaining through the decay time (while you are pressing the keyboard).

- The larger the setting value of **[Sustain]**, the higher the sustain level.
- When **[Sustain]** is set to the maximum value, the **[Decay]** time has no effect.
- When **[Sustain]** is set to the minimum value, the **[Release]** time has no effect.

### Release

The **[Release]** parameter sets the amplifier envelope release time. This sets the decay time until the envelope level becomes 0 from note-off (the sound goes off).

- The larger the setting value of **[Release]**, the longer the decay time until the envelope level becomes 0.

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## GLIDE category

Glide (also called "portamento") causes the pitch of a note to glide up or down from the pitch of the previously played note.

The TORAIZ AS-1 provides four glide modes. You can select between them to obtain the desired glide behavior.

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## GLIDE parameters

### Rate

The **[Rate]** parameter sets the rate of the glide.

The larger the setting value of **[GLIDE]**, the longer it takes to transition from one note to the next.

If you set **[GLIDE]** to **[0]**, glide will not be applied.

### Mode

The following four modes can be selected.

Mode	Formal name	Explanation
<b>FxRate</b>	Fixed Rate	The glide rate is fixed. <ul style="list-style-type: none"><li>• The time to transition between notes varies with the interval between the notes; the greater the interval, the longer the transition time.</li></ul>
<b>FxTime</b>	Fixed Time	The glide time is fixed. <ul style="list-style-type: none"><li>• The time required to transition between notes is always constant regardless of the interval between notes.</li><li>• Even if you release the keyboard once and then press the keyboard, glide is applied.</li></ul>
<b>FxRtA</b>	Fixed Rate A	The effect is the same as <b>[FxRate]</b> but glide is applied only when playing legato style. <ul style="list-style-type: none"><li>• Legato playing style is a style of playing by connecting notes (the technique of playing a key/note while briefly continuing to hold down the previous key/note).</li></ul>
<b>FxTmA</b>	Fixed Time A	The effect is the same as <b>[FxTime]</b> but glide is applied only when playing legato style. <ul style="list-style-type: none"><li>• Legato playing style is a style of playing by connecting notes (the technique of playing a key/note while briefly continuing to hold down the previous key/note).</li></ul>

### On/Off

Select **[On]**/**[Off]** of the glide function.

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## LFO (Low Frequency Oscillator) category

The **[LFO]** is a low frequency oscillator that modulates a sound in a periodic way.

The following are the typical examples of the effects using the **[LFO]**.

- Vibrato: Periodic change in sound pitch
- Wah Wah: Periodic change in tone
- Tremolo: Periodic change in volume

## LFO parameters

The following parameters appear under the [LFO] category in the display except for "Parameters in the [LFO DESTINATION] category."

### Frequency

The [Frequency] parameter sets the oscillation frequency (modulation speed) of the LFO.

- The larger the setting value of [Frequency], the higher the oscillation frequency becomes (modulation speed gets faster).
- When [Sync] is set to [On], you can set the modulation speed synchronized with BPM (tempo setting).

### Sync

When the [Sync] parameter is set to [On], the LFO frequency is synchronized to the BPMs of the arpeggiator, sequencer and MIDI clock.

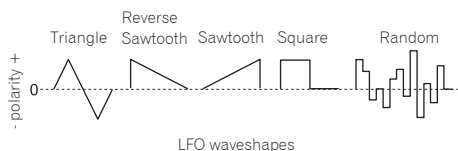
- The LFO resets the waveform each time you press the keyboard (except when playing legato style) and returns to the start point.
- When [Sync] is set to [On], the relationship between the [LFO] category's [Frequency] value and the [ARPEGGIATOR/SEQUENCER] category's [BPM] value (tempo setting) is as follows.

[Frequency] value	Tempo	Split note
32Q	BPM/32	Octuple whole note (Maxima)
16Q	BPM/16	Quadruple whole note (Longa)
8Q	BPM/8	Double whole note
6Q	BPM/6	Dotted whole note
4Q	BPM/4	Whole note
3Q	BPM/3	Dotted half note
1/2	BPM/2	Half note
1D	BPM/1.5	Dotted quarter note
1	BPM	Quarter note
1T	BPM×1.5	Quarter-note triplets
8D	BPM×4/3	Dotted eighth note
8th	BPM×2	Eighth note
8thT	BPM×3	Eighth-note triplets
16thD	BPM×8/3	Dotted 16th note
16th	BPM×4	16th note
16thT	BPM×6	16th-note triplets
32nd	BPM×8	32nd note
32ndT	BPM×12	32nd-note triplets

### Shape

The LFO waveform can be selected from the following five types.

Setting value	Waveform
Tri	Triangle
RevSaw	Reverse Sawtooth
Saw	Sawtooth
Square	Square
Random	Random



- Both triangle and random waveforms (also called "sample and hold") generate modulation effects in both positive and negative directions.

- Sawtooth, reverse sawtooth, and square waves generate modulation effects only in the positive direction.
- Here are some examples of LFO effects:
  - Apply a triangle wave LFO to an oscillator to create vibrato.
  - Apply a square wave LFO to an oscillator to create trills.
  - To generate a white noise waveform with the LFO select [Random] and set the [LFO]-[Frequency] to its maximum value.

### Initial Amount

The [Initial Amt] parameter sets the amount of LFO modulation applied to a selected destination.

Increasing the [Initial Amt] setting increases the amount of modulation applied by the LFO.

### Parameters in the [LFO DESTINATION] category

The parameters in this category are used to select the target (modulation destination) of the LFO.

The following are the six modulation destinations. You can combine them freely by setting each of them to [On]/[Off].

Parameter	Explanation
Osc1 Freq	The oscillation frequency (pitch) of the Oscillator 1 is modulated.
Osc2 Freq	The oscillation frequency (pitch) of the Oscillator 2 is modulated.
Osc1-2PW	The pulse width is modulated when both the [Shape] (waveform) parameters of the [Oscillator 1] and [Oscillator 2] categories are set to [Pulse] (pulse wave).
LP Cutoff	The cutoff frequency of the low-pass filter is modulated.
HP Cutoff	The cutoff frequency of the high-pass filter is modulated.
VCA	The volume is modulated.

## SLIDER category

The slider serves the same function as a pitch or mod wheel. You can control up to seven different parameters with the slider, and set different amounts of modulation for each, using the [SLIDER DESTINATION] category.

In addition, you can also use the slider to control filter envelope and effects level, for even greater expressiveness.

## SLIDER parameters

[SLIDER DESTINATION] is displayed as a category in the display.

### Parameters in the [SLIDER DESTINATION] category

Select the target (slider destination) to be controlled with the slider. There are seven destinations. You can set different amounts of modulation for each destination.

- The value that you set for each parameter determines the maximum amount of modulation that can be applied.
- Positive values apply modulation in the positive direction.
- Negative values apply modulation in the negative direction.

Parameter	Explanation
Osc1 Freq	Sets the maximum amount of modulation applied to Oscillator 1 frequency (pitch).
Osc2 Freq	Sets the maximum amount of modulation applied to Oscillator 2 frequency (pitch).
LPF Amount	Sets the maximum amount of modulation applied to the low-pass filter cutoff frequency.
HPF Amount	Sets the maximum amount of modulation applied to the high-pass filter cutoff frequency.
LFO Amount	Sets the maximum amount of modulation applied by the LFO.
FX1 Mix	Sets the maximum mix level of FX1.
FX2 Mix	Sets the maximum mix level of FX2.

## MODULATION category

Many of the unique sounds associated with the Prophet-5 and Prophet-6 synthesizers were produced by creative use of "Poly Mod." Poly Mod allows you to use the Filter Envelope and Oscillator 2 as modulation sources to create a wide range of complex harmonic effects, ranging from FM (frequency modulation) to audio-range filter modulation.

## MODULATION parameters

[**MODULATION SOURCE**] and [**MODULATION DESTINATION**] are displayed as categories in the display.

Under these two categories, you can select the parameters for generating the modulation effect and the degree of modulation to be applied.

For the parameters selected in the [**MODULATION DESTINATION**] category, you can set the modulation depth in either the plus direction or the minus direction.

There are two parameters, Filter Envelope ([**Filter Env**]) and Oscillator 2 Amount ([**Osc2 Amt**]) in the [**MODULATION SOURCE**] category.

The amount of change to the modulation destinations by the two modulations can be adjusted by setting each parameter's value.

- When [**Low Freq**] of [**OSCILLATOR 2**] is set to [**On**] when using Oscillator 2 as the modulation source, you can obtain an LFO-like effect.

### Parameters in the [**MODULATION DESTINATION**] category

Select the target(s) to be modulated (modulation destination(s)) from the following five parameters. By setting each parameter to [**On**] or [**Off**], you can create a variety of combinations.

Parameter	Explanation
Osc1 Freq	The oscillation frequency (pitch) of Oscillator 1 is modulated.
Osc1 Shape	Waveform can be changed continuously by modulating the [ <b>Shape</b> ] parameter in the [ <b>OSCILLATOR 1</b> ] category.
Osc1 PW	The pulse width is modulated when [ <b>Shape</b> ] (waveform) in [ <b>Oscillator 1</b> ] is set to [ <b>Pulse</b> ] (pulse wave).
LP Cutoff	The cutoff frequency of the low-pass filter is modulated.
HP Cutoff	The cutoff frequency of the high-pass filter is modulated.

## EFFECTS category

This unit is equipped with two high-quality 24-bit 48 kHz digital effectors (FX 1, FX 2). This allows you to add a delay, chorus, phaser, etc. without the need for external effects devices.

Although the effects are digitally processed, the main signal path is analog. The effects operate on a separate path and are converted to analog, and then mixed into the final signal path.

Effects settings are saved with each program.

Time-based effects such as delay can be tempo-synced to the arpeggiator, sequencer, and MIDI clock and a repetitive effect synced to the chosen BPM can be obtained.

## EFFECTS parameters

### FX On/Off

The [**FX On/Off**] parameter turns on or off the entire [**EFFECTS**] parameters.

- This parameter is linked with the [**FX ON/OFF**] button on the control panel.
- The [**FX On/Off**] parameter (or the [**FX ON/OFF**] button) enables and disables both FX1 and FX2, using a true bypass, ensuring a pure analog signal path.

### FX Type

(The [**FX1 Type**] and [**FX2 Type**] parameters appear when selecting in the display.)

You can select the desired effect type each for the [**FX1 Type**] and [**FX2 type**] parameters as shown in the following table. The effect types selected here will be edited by the parameters as shown in the table below.

Parameter	Effect type	Explanation
FX1 Type	Off	Disables FX1.
	BBD	Vintage BBD (Bucket-Brigade Delay)
	Dist	Distortion
	RingMod	Vintage Ring Modulator
FX2 Type	Off	Disables FX2.
	Chorus	Vintage Chorus
	PhaserH	Vintage Phaser (High Resonance)
	PhaserL	Vintage Phaser (Low Resonance)
	PhaserM	Vintage Phaser (Maestro phaser emulation)

### FX Mix

(The [**FX1 Mix**] and [**FX2 Mix**] parameters appear when selecting in the display.)

The [**FX1 Mix**] and [**FX2 Mix**] parameters set the mix balance between the effect sound (wet sound) and the original sound (dry sound).

- Setting the parameter to the minimum value results in 100% dry sound and setting the parameter to the maximum value results in 100% wet sound.
- Effected signals are processed in send/return paths, which ensures pure analog signal paths for the unprocessed sounds.

### FX Param

The group of the parameters to adjust the effect of the selected effect type. Each effect has two adjustable parameters, as shown in the table below.

Effect type	Parameter 1		Parameter 2		
	Displayed as	Adjusting Effect	Displayed as	Adjusting Effect	
FX1 Type	Off	FX1 Param 1	n/a	FX1 Param 2	n/a
	BBD	BBD Time	Delay time	BBD Fdbk	Feedback amount
	Dist	Dist Drive	Distortion amount	Dist Tone	Tone
	RingMod	Ring Md Tune	Frequency	Ring Mod KeyF	Tracking
FX2 Type	Off	Fx2 Param 1	n/a	FX2 Param 2	n/a
	Chorus	Chorus Rate	Rate	Chorus Dpth	Depth
	PhaserH	Phaser Rate	Rate	Phaser Dpth	Depth
	PhaserL	Phaser Rate	Rate	Phaser Dpth	Depth
	PhaserM	Phaser Rate	Rate	Phaser Dpth	Depth

### FX1 Sync

When the [**FX1 Sync**] parameter is set to [**On**] and [**BBD**] is selected as an effect type, [**BBD Time**] (delay time) can be synchronized with the arpeggiator, sequencer and MIDI clock. [**BBD Time**] is changed to and displayed as [**Sync Time**] which operates according to the values shown in the following table.

Setting value	Delay time
64th	1/16 beats (64th note)
32nd	1/8 beats (32nd note)
1/32 D	3/16 beats (dotted 32nd note)
16th	1/4 beats (sixteenth note)
1/16 D	3/8 beats (dotted 16th note)
8th	1/2 beats (eighth note)
8th D	3/4 beats (dotted eighth note)



Setting value	Delay time
<b>Qtr</b>	1 beat (quarter note)
<b>Qtr D</b>	1.5 beats (dotted quarter note)
<b>Half</b>	2 beats (half note)
<b>Half D</b>	Three beats (dotted half note)

## AFTERTOUCH category

Aftertouch is a performance feature that allows you to add modulation to a sound by applying additional pressure to a key after the key is already down.

There are six parameters that can control the amount of modulation applied with aftertouch.

In the display, set the **[Amount]** parameter in the **[AFTERTOUCH]** category to set the aftertouch amount. Then, set each parameter in the **[AFTERTOUCH DESTINATION]** category to **[On]/[Off]** apply aftertouch to the desired parameter(s).

### AFTERTOUCH parameters

**[AFTERTOUCH]** and **[AFTERTOUCH DESTINATION]** are displayed as categories in the display.

#### Amount

(This is the parameter in the **[AFTERTOUCH]** category.)

The **[Amount]** parameter sets the aftertouch depth.

- If you increase the **[Amount]** value in the plus direction, aftertouch effect will increase in the plus direction.
- If you increase the **[Amount]** value in the minus direction, aftertouch effect will increase in the minus direction or decrease depending on the parameter.

#### Parameters in the **[AFTERTOUCH DESTINATION]** category

Select the target(s) to which you wish to apply aftertouch (aftertouch destination(s)).

The following six parameters can be selected as aftertouch destinations. Use **[On/Off]** to enable aftertouch for a specific parameter.

Parameter	Explanation
<b>Osc 1 Freq</b>	<p>Changes the oscillation frequency (pitch) of Oscillator 1.</p> <ul style="list-style-type: none"> <li>• If the <b>[Amount]</b> value is set in the plus direction, the pitch of Oscillator 1 will rise as you further press down the keyboard.</li> <li>• If the <b>[Amount]</b> value is set in the minus direction, the pitch of Oscillator 1 will lower as you further press down the keyboard.</li> </ul>
<b>Osc 2 Freq</b>	<p>Changes the oscillation frequency (pitch) of Oscillator 2.</p> <ul style="list-style-type: none"> <li>• If the <b>[Amount]</b> value is set in the plus direction, the pitch of Oscillator 2 will rise as you further press down the keyboard.</li> <li>• If the <b>[Amount]</b> value is set in the minus direction, the pitch of Oscillator 2 will lower as you further press down the keyboard.</li> </ul>
<b>LP Cutoff</b>	<p>Changes the cutoff frequency of the low-pass filter.</p> <ul style="list-style-type: none"> <li>• If the <b>[Amount]</b> value is set in the plus direction, the cutoff frequency will rise as you further press down the keyboard.</li> <li>• If the <b>[Amount]</b> value is set in the minus direction, the cutoff frequency will lower as you further press down the keyboard.</li> <li>• If the <b>[Cutoff]</b> value is set to the maximum or the minimum, aftertouch may have no effect depending on the <b>[Amount]</b> value.</li> </ul>
<b>HP Cutoff</b>	<p>Changes the cutoff frequency of the high-pass filter.</p> <ul style="list-style-type: none"> <li>• If the <b>[Amount]</b> value is set in the plus direction, the cutoff frequency will rise as you further press down the keyboard.</li> <li>• If the <b>[Amount]</b> value is set in the minus direction, the cutoff frequency will lower as you further press down the keyboard.</li> <li>• If the <b>[Cutoff]</b> value is set to the maximum or the minimum, aftertouch may have no effect depending on the <b>[Amount]</b> value.</li> </ul>

Parameter	Explanation
<b>VCA</b>	<p>Changes the volume.</p> <ul style="list-style-type: none"> <li>• If the <b>[Amount]</b> value is set in the plus direction, the volume will increase as you further press down the keyboard.</li> <li>• If the <b>[Amount]</b> value is set in the minus direction, the volume will decrease as you further press down the keyboard.</li> <li>• If the <b>[Amount]</b> and <b>[Sustain]</b> values in the <b>[AMP ENVELOPE]</b> category are set to the maximum, aftertouch may have no effect.</li> </ul>
<b>LFO Amt</b>	<p>Changes the <b>[Initial Amt]</b> value in the <b>[LFO]</b> category.</p> <ul style="list-style-type: none"> <li>• If the <b>[Amount]</b> value is set in the plus direction, the effect of the LFO will increase as you further press down the keyboard.</li> <li>• Even if the <b>[Amount]</b> value is set in the minus direction, the effect of the LFO will increase, but the LFO waveform is inverted (reversed phase).</li> </ul>

## MISC PARAMETERS (Miscellaneous parameters) category

You can set various important functions using the parameters in the **[MISC PARAMETERS]** category.

### Parameters in the **[MISC PARAMETERS]** category

#### KeyMode

The **[KeyMode]** parameter sets the key assignment (also called “note priority”). This determines what note has priority when more than one note is played on the keyboard or via MIDI.

<b>[KeyMode] parameter</b>		<b>Operation</b>
<b>Value</b>	<b>Meaning</b>	
<b>Low</b>	Low-note priority (Single trigger)	It is the most popular method when using a vintage synthesizer. It is often used to play trill while holding down one of the keys. The lower note is played without the envelope being retriggered.
<b>Hi</b>	High-note priority (Single trigger)	When playing trill by holding down one of the keys, the higher note is played without the envelope being retriggered.
<b>Last</b>	Last-note priority (Single trigger)	When playing trill by holding down one of the keys, the last pressed key is played without the envelope being retriggered regardless of whether or a lower note or a higher note is played..
<b>LowR</b>	Low-note priority + retrigger (Multi trigger)	When playing trill by holding down a lower note, the envelope is always retriggered.
<b>HiR</b>	High-note priority + retrigger (Multi trigger)	When playing trill by holding down a higher note, the envelope is always retriggered.
<b>LastR</b>	Last-note priority + retrigger (Multi trigger)	When playing trill by holding down one of the keys, the pitch of the last pressed key is played with the envelope being retriggered whether or a lower note or a higher note is played..

#### Volume

The volume of each program can be set independently. This is useful for ensuring that your sounds have roughly the same volume from program to program.

#### PitchbndRange

You can set the pitch bend range in semitone unit up to +/- 12 semitones (1 octave).

## ARPEGGIATOR/SEQUENCER category

The arpeggiator and sequencer have the following features:

- The sequencer has a maximum of 64-steps, with the ability to add ties and rests.
- The arpeggiator has a range of three octaves and several operating modes including, UP, DOWN, UP & DOWN, etc.

## ARPEGGIATOR/SEQUENCER parameters

### BPM

The **[BPM]** (Beat Per Minute) parameter sets the tempo at which the arpeggiator and sequencer operate when **[MIDI Clock Mode]** of **[GLOBAL SETTING]** is set to master mode (**[Off]/[Master]**).

- When **[MIDI Clock Mode]** is set to slave mode (**[Slave]/[Slave Thru]/[Slave No S/S]**), this **[BPM]** setting is ignored and synchronizes with the external MIDI clock.
- The **[BPM]** setting is linked with the **[CLOCK TAP]** button on the control panel, and the **[CLOCK TAP]** button flashes according to the set tempo.
- You can also set **[BPM]** by tapping the **[CLOCK TAP]** button on the control panel at least three times at your desired tempo, or by turning the **[CLOCK BPM/DIVIDE]** dial.
- The setting range of **[BPM]** is between 30 and 250.
- The **[BPM]** setting will affect the frequency of the LFO and the BBD effect when **[Sync]** of the **[LFO]** category or **[FX 1 Sync]** of the **[EFFECTS]** category is set to **[On]**.

### TimeDiv

Sets the time value for each sequencer/arpeggiator step relative to the BPM. This value applies to both internal and external clock sources. The following table lists the values:

<b>[TimeDiv] setting value</b>	<b>[BPM] setting (tempo)</b>	<b>Split note</b>
2	BPM/2	Half note
4	BPM	Quarter note
8D	BPM x2	Dotted eighth note
8	BPM x2	Eighth note
8S	BPM x2	Eighth note (Swing)
8T	BPM x3	Eighth note triplets
16	BPM x4	16th note
16S	BPM x4	16th note (Swing)
16T	BPM x6	16th note triplets
32	BPM x8	32nd note

## ARPEGGIATOR category

When you turn on the arpeggiator and hold a chord on the keyboard, the TORAIZ AS-1 will play a pattern based on the individual notes held.

You can choose a mode (up, down, random, etc.), an octave range (1, 2, or 3), and a tempo.

- If you turn on the **[HOLD]** button on the control panel, the arpeggio continues to play even if you release your fingers from the keyboard. When the **[HOLD]** button is On, the arpeggio performance will be as follows.
  - If you play a new chord, the current arpeggio play is replaced by the new one.
  - If you press another key while pressing down more than one key, the pitch of the newly pressed key will be added to the current arpeggio by the auto latch feature.
- The sequencer cannot be used while the arpeggiator function is On.

## ARPEGGIATOR parameters

### On/Off

The **[On/Off]** parameter turns on/off the arpeggiator function. This parameter is linked with the **[ARP]** button on the control panel.

### Mode

The **[Mode]** parameter sets the behavior of the arpeggiator corresponding to the played chord.

You can choose from the following five modes.

<b>Mode</b>	<b>Arpeggio behavior</b>
Up	A played chord is arpeggiated from the lowest pitch to higher pitches.
Down	A played chord is arpeggiated from the highest pitch to lower pitches.
Up+Down	Repeatedly plays from lowest to highest and back to lowest.
Random	The notes of a chord are played in random order.
Assign	Plays notes in the order the keys were pressed.

### Range

The **[Range]** parameter sets the range from one octave to three octaves in which a chord is arpeggiated.

The settings and arpeggio behavior are as follows.

<b>[Range] setting</b>	<b>In octave unit</b>	<b>Arpeggiated behavior</b>
10ct	1 octave	Only the held notes are arpeggiated.
20ct	2 octaves	The held notes and the same notes one octave above them arpeggiate.
30ct	3 octaves	The held notes and the same notes one and two octave above them arpeggiate.

## SEQUENCER category

The sequencer allows you to create a single sequence of up to 64 steps, including rests and ties. Saving a sound saves any sequence you have created for it.

- When the sequencer is playing, the arpeggiator is disabled.
- For how to create sequencer patterns and play them, see "Using the sequencer" (page 10).

## SEQUENCER parameters

### Length

The **[Length]** parameter sets the number of steps in the sequence.

- Up to 64 steps can be set.

### Note

The **[Note]** parameter sets notes for each step.

- From **[C0]** to **[C10]** can be set.
- See "Using the sequencer" (page 10) for adding ties.

### Vel

The **[Vel]** parameter sets the velocity for each step.

- To create a rest, set the value to **[Rest]**.

### Slew

The **[Slew]** sets the slur setting to **[On]/[Off]**.

When set to **[On]**, you can smoothly connect adjacent different pitches.

# Parameter list

Category name in the display	Parameter
OSCILLATOR 1	Frequency
	Shape
	Pulse Width
	Sync
OSCILLATOR 2	Frequency
	Fine
	Shape
	Pulse Width
	Key Follow
OSCILLATORS	Low Freq
	Slop
MIXER	Osc1Level
	Osc2Level
	Sub Level
	Noise Level
LOW-PASS FILTER	Cutoff
	Resonance
	Key Amount
	Velocity
HIGH-PASS FILTER	Cutoff
	Resonance
	Key Amount
	Velocity
FILTER ENVELOPE	LP Amount
	HP Amount
	Attack
	Decay
	Sustain
	Release
AMP ENVELOPE	Amount
	Velocity
	Attack
	Decay
	Sustain
	Release
GLIDE	Rate
	Mode
	On/Off
LFO	Frequency
	Sync
	Shape
	Initial Amt
LFO DESTINATION	Osc 1 Freq
	Osc 2 Freq
	Osc 1-2 PW
	LP Cutoff
	HP Cutoff
	VCA

Category name in the display	Parameter
SLIDER DESTINATION	Osc 1 Freq
	Osc 2 Freq
	LPF Amount
	HPF Amount
	LFO Amount
	FX1 Mix
	FX2 Mix
MODULATION SOURCE	Filter Env
	Osc 2 Amt
MODULATION DESTINATION	Osc 1 Freq
	Osc 1 Shape
	Osc 1 PW
	LP Cutoff
	HP Cutoff
EFFECTS	FX On/Off
	FX1 Type
	FX1 Mix
	FX1 Param 1
	FX1 Param 2
	FX1 Sync
	FX2 Type
	FX2 Mix
	FX2 Param 1
	FX2 Param 2
AFTERTOUCH	Amount
AFTERTOUCH DESTINATION	Osc 1 Freq
	Osc 2 Freq
	LP Cutoff
	HP Cutoff
	VCA
	LFO Amt
MISC PARAMETERS	Key Mode
	Volume
	Pitchbnd Range
ARPEGGIATOR/ SEQUENCER	BPM
	TimeDiv
ARPEGGIATOR	On/Off
	Mode
	Range

Category name in the display	Parameter
SEQUENCER	Length
	Note 1
	Vel 1
	Slew 1
	Note 2
	Vel 2
	Slew 2
	Note 3
	Vel 3
	Slew 3
	Note 4
	Vel 4
	Slew 4
	Note 5
	Vel 5
	Slew 5
	Note 6
	Vel 6
Slew 6	
Note 7	
Vel 7	
Slew 7	
Note 8	
Vel 8	
Slew 8	
Note 9	
Vel 9	
Slew 9	
Note 10	
Vel 10	
Slew 10	
Note 11	
Vel 11	
Slew 11	
Note 12	
Vel 12	
Slew 12	
Note 13	
Vel 13	
Slew 13	
Note 14	
Vel 14	
Slew 14	
Note 15	
Vel 15	
Slew 15	
Note 16	
Vel 16	
Slew 16	
Note 17	
Vel 17	
Slew 17	
Note 18	
Vel 18	
Slew 18	

Category name in the display	Parameter
	Note 19
	Vel 19
	Slew 19
	Note 20
	Vel 20
	Slew 20
	Note 21
	Vel 21
	Slew 21
	Note 22
	Vel 22
	Slew 22
	Note 23
	Vel 23
	Slew 23
	Note 24
	Vel 24
	Slew 24
	Note 25
	Vel 25
	Slew 25
	Note 26
	Vel 26
	Slew 26
	Note 27
	Vel 27
	Slew 27
	Note 28
	Vel 28
	Slew 28
	Note 29
	Vel 29
	Slew 29
	Note 30
	Vel 30
	Slew 30
	Note 31
	Vel 31
	Slew 31
	Note 32
	Vel 32
	Slew 32
	Note 33
	Vel 33
	Slew 33
	Note 34
	Vel 34
	Slew 34
	Note 35
	Vel 35
	Slew 35
	Note 36
	Vel 36
	Slew 36
	Note 37
	Vel 37
	Slew 37

Category name in the display	Parameter
	Note 38
	Vel 38
	Slew 38
	Note 39
	Vel 39
	Slew 39
	Note 40
	Vel 40
	Slew 40
	Note 41
	Vel 41
	Slew 41
	Note 42
	Vel 42
	Slew 42
	Note 43
	Vel 43
	Slew 43
	Note 44
	Vel 44
	Slew 44
	Note 45
	Vel 45
	Slew 45
	Note 46
	Vel 46
	Slew 46
	Note 47
	Vel 47
	Slew 47
	Note 48
	Vel 48
	Slew 48
	Note 49
	Vel 49
	Slew 49
	Note 50
	Vel 50
	Slew 50
	Note 51
	Vel 51
	Slew 51
	Note 52
	Vel 52
	Slew 52
	Note 53
	Vel 53
	Slew 53
	Note 54
	Vel 54
	Slew 54
	Note 55
	Vel 55
	Slew 55
	Note 56
	Vel 56
	Slew 56

Category name in the display	Parameter
	Note 57
	Vel 57
	Slew 57
	Note 58
	Vel 58
	Slew 58
	Note 59
	Vel 59
	Slew 59
	Note 60
	Vel 60
	Slew 60
	Note 61
	Vel 61
	Slew 61
	Note 62
	Vel 62
	Slew 62
	Note 63
	Vel 63
	Slew 63
	Note 64
	Vel 64
	Slew 64

# Changing the unit settings ([GLOBAL SETTING])

Global settings are parameters that affect all programs. These include settings such as Master Tune, MIDI Channel, MIDI Clock, and others. To change Global settings, press the [GLOBAL/WRITE] button and the [GLOBAL SETTING] screen appears. Any change in [GLOBAL SETTING] will be reflected in all programs.

## [GLOBAL SETTING] menu items

No.	Menu item (in the display)	Setting value/range	Explanation
1	Master Coarse	-12 to 0* to +12	Sets the sound pitch. • You can adjust the pitch in chromatic increments from the center [0] in the range of minus one octave to plus one octave.
2	Master Fine	-50 to 0* to +50	Sets the sound pitch. • You can adjust the pitch in cent increments from the center [0] in the range of minus 0.5 halftone to plus 0.5 halftone.
3	Scale Mode	Normal*, Ionian, Dorian, Phrygian, Lydian, Mixolydian, Aeolian, Locrian, Maj Penta, Min Penta, Whole Tone, Diminished, Combo Dim, Altered, Maj Blues, Min Blues, Raga B., Raga G., Raga T., Hawaiian, Ryukyu, JP Miyakob	Sets the scale of the keyboard. • The scale of the white keys of the keyboard changes according to the selected scale. • If you select a scale other than [Normal], the black keys play no sound even if you touch them.
4	Quick Program	Prog: 1 to Prog: 13	Sets the quick program. For details on how to do this, see "Using the Quick Program function" (page 11).
5	MIDI Channel	All*, 1 to 16	Sets the channel to send and receive MIDI messages.
6	MIDI Clock Mode	Off*, Master, Slave, Slave Thru, Slave No S/S	Sets the setting related to the MIDI clock for this unit. • <b>Off</b> : The unit does not send/receive MIDI clock. • <b>Master</b> : The unit sends MIDI clock but does not receive it. • <b>Slave</b> : The unit receives MIDI clock but does not send it. • <b>Slave Thru</b> : The unit sends the received MIDI clock without change through [MIDI OUT/THRU]. • <b>Slave No S/S</b> : The unit receives MIDI clock but does not respond to start and stop messages. • When [MIDI Clock Mode] is set to [Slave], [Slave Thru], [Slave No S/S], the [TAP] button goes out if no MIDI clock is input. In that state, if [Screen Saver] is set to [On], the screen saver functions and the screen display disappears, the [TAP] button lights up.
7	MIDI Clock Cable	MIDI Port*, USB	Selects which rear-panel connector receives MIDI Clock.
8	MIDI Param Send	Off, CC, NRPN*	Sets the method to transmit the operations of the unit's control panel controllers (like buttons and controls) and any changes in the parameters by MIDI. • See "MIDI implementation" (page 28) for the MIDI messages transmitted when each controller/parameter is operated.
9	MIDI Param Rcv	Off, CC, NRPN*	Sets the method to receive MIDI messages.
10	MIDI Control Enable	Off, On*	Sets whether or not to receive external MIDI control information.
11	MIDI SysEx Cable	MIDI, USB*	Sets the terminal to send and receive SysEx (System Exclusive) messages. This unit uses SysEx for system updates and program transmission and reception.
12	MIDI Out Select	MIDI, USB, MIDI+USB*	Selects which rear-panel connector transmits MIDI data.
13	MIDI Out/Thru	Out*, Thru	Sets the method of sending MIDI data.
14	MIDI Seq/Arp Out	Off*, On	Sets whether to transmit MIDI data when playing using this unit's sequencer and arpeggiator. Set this item to [On] when you want to play an external MIDI device (such as a synthesizer, sequencer, etc.) using this unit's sequencer and arpeggiator.
15	Local Control	Off, On*	This selects whether or not the keyboard and control panel controls directly affect the synthesizer. • <b>Off</b> : MIDI data will be transmitted from this unit, but that data will not be sent to the internal synthesizer sound generator. • <b>On</b> : MIDI data is transmitted from this unit, and the data is also reflected in the internal synthesizer sound generator. Do not use this setting when you use the unit independently. Use this setting to prevent MIDI data loop from occurring when you use the unit in combination with an external MIDI device.
16	Mono/Stereo	Stereo*, Mono	Sets the audio output method.

\*The setting when you purchased this unit.

No.	Menu item (in the display)	Setting value/range	Explanation
17	Pot Mode	Relative, Passthru, Jump*	<p>This determines how the synthesizer reacts when you edit parameters using its controls (knobs). Because parameter values and their corresponding control positions are saved with each program, changing programs will usually mean that the current physical control positions don't show the actual parameter values for the program. For this reason, turning a control can cause a sound to change suddenly as the value "jumps" to the physical knob's position. Use <b>[Pot Mode]</b> to set control/parameter response according to your preference.</p> <ul style="list-style-type: none"> <li>• <b>Relative:</b> The operating positions of the controls and the actual parameter values change relatively.</li> <li>• <b>Passthru:</b> When the operating position of a control coincides with the actual parameter value, the parameter value will change according to the control position.</li> <li>• <b>Jump:</b> The actual parameter values change to the operating positions of the controls instantly.</li> </ul>
18	Alternative Tuning	1* to 17	<p>Sets the built-in tuning mode.</p> <ul style="list-style-type: none"> <li>• <b>1:</b> Standard western chromatic tuning mode</li> <li>• <b>2 to 17:</b> Alternative tunings, including non-western, non-chromatic tunings found in some ethnic and historical instruments.</li> </ul> <p>For details, see "Alternate tuning list" (page 24).</p>
19	Screen Saver	Off, On*	Sets whether or not to have a screen saver.
20	Seq Jack Mode	Pedal*, Trigger, Gate, Gate+Trigger	<p>Sets the operation when a general foot switch is connected or audio signals are input to <b>[TRIGGER IN]</b>.</p> <ul style="list-style-type: none"> <li>• <b>Pedal:</b> plays or stops the sequencer.</li> <li>• <b>Trigger:</b> When the sequencer is On, the step advances one step each time it receives a signal.</li> <li>• <b>Gate:</b> When the unit receives a signal while you are touching the keyboard, the unit gates or triggers the envelope. Also, when the sequencer or arpeggiator is On, the unit plays or stops according to the set BPM value.</li> <li>• <b>Gate+Trigger:</b> When the unit receives a signal while you are touching the keyboard, it gates or triggers the envelope. Also, when the sequencer is On, the step advances one step each time it receives a signal.</li> </ul> <p>For operational details, see "Using with external equipment" (page 26).</p>
21	Keys Sens	1 to 10 (4*)	<p>Adjusts the touch sensitivity of the keyboard. The TORAIZ AS-1's keyboard is an electrostatic capacitive touch pad and you can adjust the keyboard touch sensitivity to a player and use environment using this setting.</p> <ul style="list-style-type: none"> <li>• <b>[1]</b> is maximum and <b>[10]</b> is the minimum sensitivity.</li> </ul>
22	Pedal Polarity	Normal*, Reversed	<p>Sets the polarity of the foot pedal connected to <b>[TRIGGER IN]</b>.</p> <ul style="list-style-type: none"> <li>• <b>Normal:</b> Open</li> <li>• <b>Reversed:</b> Closed</li> </ul>
23	Basic Program	–	Initializes the selected program.
24	Calibrate	–	Calibrates Oscillator 1, Oscillator 2 and low-pass filter.
25	Reset Globals	–	Initializes <b>[GLOBAL SETTING]</b> .
26	Dump Prog	–	Sends the settings of the selected program as a MIDI SysEx message.
27	Dump Bank	–	Sends the settings of the programs in the selected bank as MIDI SysEx messages.
28	Dump All Banks	–	Sends the settings of the programs in all the banks as MIDI SysEx messages.

\*The setting when you purchased this unit.

# Keyboard mode scale list

No.	Scale name	Name in the display	Keyboard assignment
1	Ionian	Ionian	C <sup>1</sup> D <sup>2</sup> E <sup>3</sup> F <sup>4</sup> G <sup>5</sup> A <sup>10</sup> B <sup>11</sup> C <sup>13</sup>
2	Dorian	Dorian	C <sup>1</sup> D <sup>2</sup> Eb <sup>3</sup> F <sup>4</sup> G <sup>5</sup> A <sup>10</sup> Bb <sup>11</sup> C <sup>13</sup>
3	Phrygian	Phrygian	C <sup>1</sup> Db <sup>2</sup> Eb <sup>3</sup> F <sup>4</sup> G <sup>5</sup> Ab <sup>10</sup> Bb <sup>11</sup> C <sup>13</sup>
4	Lydian	Lydian	C <sup>1</sup> D <sup>2</sup> E <sup>3</sup> F# <sup>4</sup> G <sup>5</sup> A <sup>10</sup> B <sup>11</sup> C <sup>13</sup>
5	Mixolydian	Mixolydian	C <sup>1</sup> D <sup>2</sup> E <sup>3</sup> F <sup>4</sup> G <sup>5</sup> A <sup>10</sup> Bb <sup>11</sup> C <sup>13</sup>
6	Aeolian	Aeolian	C <sup>1</sup> D <sup>2</sup> Eb <sup>3</sup> F <sup>4</sup> G <sup>5</sup> Ab <sup>10</sup> Bb <sup>11</sup> C <sup>13</sup>
7	Locrian	Locrian	C <sup>1</sup> Db <sup>2</sup> Eb <sup>3</sup> F <sup>4</sup> Gb <sup>5</sup> Ab <sup>10</sup> Bb <sup>11</sup> C <sup>13</sup>
8	Major Pentatonic	MajPenta	C <sup>1</sup> D <sup>2</sup> E <sup>3</sup> G <sup>4</sup> A <sup>10</sup> C <sup>13</sup> D <sup>11</sup> E <sup>9</sup>
9	Minor Pentatonic	MinPenta	C <sup>1</sup> Eb <sup>3</sup> F <sup>4</sup> G <sup>5</sup> Bb <sup>11</sup> C <sup>13</sup> Eb <sup>9</sup> F <sup>9</sup>
10	Whole tone	Whole Tone	C <sup>1</sup> D <sup>2</sup> E <sup>3</sup> F# <sup>4</sup> G# <sup>5</sup> A# <sup>10</sup> C <sup>13</sup> D <sup>11</sup>
11	Diminished	Diminished	C <sup>1</sup> D <sup>2</sup> Eb <sup>3</sup> F <sup>4</sup> Gb <sup>5</sup> G# <sup>10</sup> A <sup>11</sup> B <sup>12</sup>
12	Combination Diminished	Combo Dim	C <sup>1</sup> Db <sup>2</sup> Eb <sup>3</sup> Fb <sup>4</sup> Gb <sup>5</sup> G <sup>10</sup> A <sup>11</sup> Bb <sup>12</sup>
13	Altered	Altered	C <sup>1</sup> Db <sup>2</sup> D# <sup>3</sup> E <sup>4</sup> F# <sup>5</sup> Ab <sup>10</sup> Bb <sup>11</sup> C <sup>13</sup>
14	Major Blues	Maj Blues	C <sup>1</sup> D <sup>2</sup> Eb <sup>3</sup> E <sup>4</sup> G <sup>5</sup> A <sup>10</sup> C <sup>13</sup> D <sup>11</sup>
15	Minor Blues	Min Blues	C <sup>1</sup> Eb <sup>3</sup> F <sup>4</sup> Gb <sup>5</sup> G <sup>10</sup> Bb <sup>11</sup> C <sup>13</sup> Eb <sup>9</sup>
16	Raga Bhairav	Raga B.	C <sup>1</sup> Db <sup>2</sup> E <sup>3</sup> F <sup>4</sup> G <sup>5</sup> Ab <sup>10</sup> B <sup>11</sup> C <sup>13</sup>
17	Raga Gamanasrama	Raga G.	C <sup>1</sup> Db <sup>2</sup> E <sup>3</sup> F# <sup>4</sup> G <sup>5</sup> A <sup>10</sup> B <sup>11</sup> C <sup>13</sup>
18	Raga Todi	Raga T.	C <sup>1</sup> Db <sup>2</sup> Eb <sup>3</sup> F# <sup>4</sup> G <sup>5</sup> Ab <sup>10</sup> B <sup>11</sup> C <sup>13</sup>
19	Hawaiian	Hawaiian	C <sup>1</sup> D <sup>2</sup> Eb <sup>3</sup> G <sup>4</sup> A <sup>10</sup> C <sup>13</sup> D <sup>11</sup> Eb <sup>9</sup>
20	Ryukyu	Ryukyu	C <sup>1</sup> D <sup>2</sup> F <sup>4</sup> G <sup>5</sup> B <sup>10</sup> C <sup>13</sup> E <sup>11</sup> F <sup>9</sup>
21	Japanese Miyakobushi	JP Miyakob	C <sup>1</sup> Db <sup>2</sup> F <sup>4</sup> G <sup>5</sup> Ab <sup>10</sup> C <sup>13</sup> Db <sup>11</sup> F <sup>9</sup>

# Alternate tuning list

No.	Scale name	Displayed	Explanation
1	Equal Temperament	Equal Temperme..	The default Western tuning, based on the twelfth root of two.
2	Harmonic Series	HrmA1-60	MIDI notes 36-95 reflect harmonics 2 through 60 based on the fundamental of A= 27.5 Hz. The low C on a standard 5 octave keyboard acts as the root note (55 Hz), and the harmonics play upwards from there. The remaining keys above and below the 5 octave range are filled with the same intervals as Carlos' Harmonic 12 Tone that follows.
3	Carlos Harmonic Twelve Tone	HrmA-12T	Wendy Carlos' twelve note scale based on octave-repeating harmonics. A= 1/1 (440 Hz). 1/1 17/16 9/8 19/16 5/4 21/16 11/8 3/2 13/8 27/16 7/4 15/8
4	Meantone Temperament	Meantone	An early tempered tuning, with better thirds than 12-ET. Sounds best in the key of C. Use this to add an authentic touch to performances of early Baroque music. C=1/1 (260 Hz)
5	1/4 Tone Equal Temperament	1/4TonET	24 notes per octave, equally spaced 24root2 intervals. Mexican composer Julian Carillo used this for custom-built pianos in the early 20th century.
6	19 Tone Equal Temperament	19ToneET	19 notes per octave (19root2) offering better thirds than 12-ET, a better overall compromise if you can figure out the keyboard patterns.
7	31 Tone Equal Temperament	31ToneET	Many people consider 31root2 to offer the best compromise towards just intonation in an equal temperament, but it can get very tricky to keep track of the intervals.
8	Pythagorean C	PythagoC	One of the earliest tuning systems known from history, the Pythagorean scale is constructed from an upward series of pure fifths (3/2) transposed down into a single octave. The tuning works well for monophonic melodies against fifth drones, but has a very narrow palate of good chords to choose from. C=1/1 (261.625 Hz) 1/1 256/243 9/8 32/27 81/64 4/3 729/512 3/2 128/81 27/16 16/9 243/128
9	Just Intonation in A with 7-limit Tritone at D#	JIA7/5D	A rather vanilla 5-limit small interval JI, except for a single 7/5 tritone at D#, which offers some nice possibilities for rotating around bluesy sevenths. A=1/1 (440 Hz) 1/1 16/15 9/8 6/5 5/4 7/5 3/2 8/5 5/3 9/5 15/8
10	3-5 Lattice in A	3-5LattA	A pure 3 and 5-limit tuning which resolves to very symmetrical derived relationships between notes. A=1/1 (440 Hz) 1/1 16/15 10/9 6/5 5/4 4/3 64/45 3/2 8/5 5/3 16/9 15/8
11	3-7 Lattice in A	3-7LattA	A pure 3 and 7-limit tuning which resolves to very symmetrical derived relationships between notes. Some of the intervals are very close together, offering several choices for the same nominal chords. A= 1/1 (440 Hz) 1/1 9/8 8/7 7/6 9/7 21/16 4/3 3/2 32/21 12/7 7/4 63/32
12	Other Music 7-limit Black Keys in C	7LimBlkC	Created by the group Other Music for their homemade gamelan, this offers a wide range of interesting chords and modes. C=1/1 (261.625 Hz) 1/1 15/14 9/8 7/6 5/4 4/3 7/5 3/2 14/9 5/3 7/4 15/8
13	Dan Schmidt Pelog/Slendro	PeISlenB	Created for the Berkeley Gamelan group, this tuning fits an Indonesian-style heptatonic Pelog on the white keys and pentatonic Slendro on the black keys, with B and B $\flat$ acting as 1/1 for their respective modes. Note that some of the notes will have the same frequency. By tuning the 1/1 to 60 Hz, Dan found a creative way to incorporate the inevitable line hum into his scale. B $\flat$ , B = 1/1 (60 Hz) 1/1 1/1 9/8 7/6 5/4 4/3 11/8 3/2 3/2 7/4 7/4 15/8
14	Yamaha Just Major C	JIMajYam	When Yamaha decided to put preset microtunings into their FM synth product line, they selected this and the following tuning as representative just intonations. As such, they became the de-facto introduction to JI for many people. Just Major gives preferential treatment to major thirds on the sharps, and a good fourth relative to the second. C= 1/1 (261.625 Hz) 1/1 16/15 9/8 6/5 5/4 4/3 45/32 3/2 8/5 5/3 16/9 15/8
15	Yamaha Just Minor C	JIMinYam	Similar to Yamaha's preset Just Major, the Just Minor gives preferential treatment to minor thirds on the sharps, and has a good fifth relative to the second. C= 1/1 (261.625 Hz) 1/1 25/24 10/9 6/5 5/4 4/3 45/32 3/2 8/5 5/3 16/9 15/8
16	Harry Partch 11-limit 43 Note Just Intonation	Partch11	One of the pioneers of modern microtonal composition, Partch built a unique orchestra with this tuning during the first half of the 20th century, to perform his own compositions. The large number of intervals in this very dense scale offers a full vocabulary of expressive chords and complex key changes. The narrow spacing also allows fixed-pitched instruments like marimbas and organs to perform glissando-like passages. G = 1/1 (392 Hz, MIDI note 67) 1/1 81/80 33/32 21/20 16/15 12/11 11/10 10/9 9/8 8/7 7/6 32/27 6/5 11/9 5/4 14/11 9/7 21/16 4/3 27/20 11/18 7/5 10/7 16/11 40/27 3/2 32/21 14/9 11/7 8/5 18/11 5/3 27/16 12/7 7/4 16/9 9/5 20/11 11/6 15/8 40/21 64/33 160/81



No.	Scale name	Displayed	Explanation
17	Arabic 12-tone	ArabianC	<p>A 12-tone approximation of an Arabic scale, which appears in some electronic keyboards designed for use with Arabic music. Not a JI scale, nor equal tempered. These are the intervals in Cents relative to C:</p> <p>60 = Cents 0          61 = Cents + 151          62 = Cents + 204          63 = Cents + 294          64 = Cents + 355          65 = Cents + 498          66 = Cents + 649          67 = Cents + 702          68 = Cents + 853          69 = Cents + 906          70 = Cents + 996          71 = Cents + 1057          72 = Cents + 1200</p>

## Calibration

Although the TORAIZ AS-1 has been calibrated at the factory, it is necessary to calibrate the unit using its calibration function for stable operation to adapt the unit to your usage environment. (Since the unit's oscillators and filters are composed of analog circuits and operated by voltage control, oscillation frequency and cutoff frequency may fluctuate due to the influence of external factors such as air temperature and power supply voltage.)

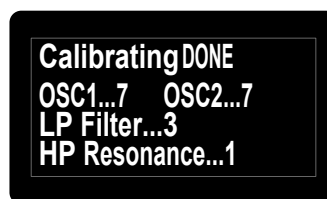
### Calibration frequency

When using the TORAIZ AS-1 for the first time, it is recommended to calibrate the unit using its calibration function after turning on the power.

- Wait for about 10 to 20 minutes to warm up the unit after turning on the power before you start calibrating.
- Repeat calibration continuously for several days in the environment to be used so that you can tune the oscillators and filters to the condition suitable for your environment.

It is also recommended to do the same when you intend to use the unit in an environment different from usual, such as using it on stage.

- It is also recommended for your daily usage that you wait about 10 to 20 minutes after tuning on the power before you start using the unit. This is to warm up the unit and reduce the variation factor of the analog circuit due to the temperature rise inside the unit.



Screen example during calibration

#### 4 Press the [GLOBAL/WRITE] button again.

The display returns to the main screen from the [GLOBAL SETTING] screen.

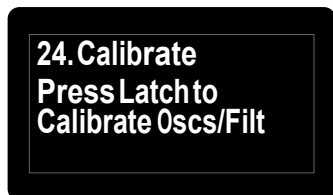
## Performing calibration

### 1 Press the [GLOBAL/WRITE] button.

The [GLOBAL/WRITE] button lights up and the [GLOBAL SETTING] screen appears in the display.

### 2 Turn the [PARAM/CATEGORY] control until the [Calibrate] screen appears.

The [LATCH] button flashes.



### 3 Press the [Latch] button

Calibration starts.

When the calibration is completed, the display automatically returns to the [Calibrate] screen shown in step 2.

- To cancel without performing the calibration, press the [GLOBAL/WRITE] button again instead of the [LATCH] button. The display returns to the main screen without calibration.

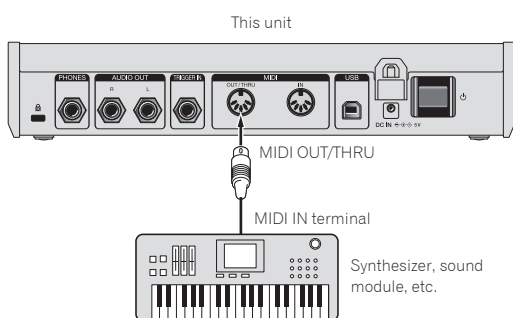
# Using with external equipment

This chapter explains how to connect the TORAIZ AS-1 to an external MIDI device or computer and use it in combination with them. For details on the setting items described in the operation procedures, see "Changing settings ([GLOBAL SETTING])" (page 22).

## Connecting this unit to an external MIDI device or computer and playing

### Playing an external MIDI device from this unit

1 Connect the [MIDI OUT/THRU] of this unit to the MIDI IN terminal of an external MIDI device with a MIDI cable.



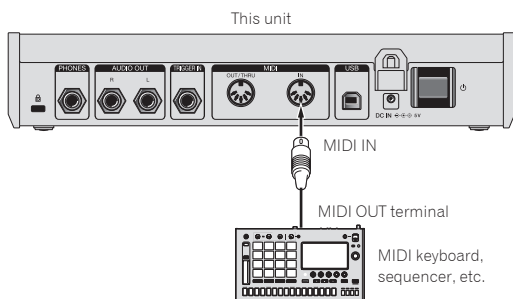
2 Set [MIDI Out Select] of [GLOBAL SETTING] to [MIDI] or [MIDI + USB].

3 Play with the keyboard, sequencer or arpeggiator.

- To use the sequencer or arpeggiator, set [MIDI Seq/Arp Out] of [GLOBAL SETTING] to [On].

### Playing this unit from an external MIDI device

1 Connect the [MIDI IN] of this unit to the MIDI OUT terminal of an external MIDI device with a MIDI cable.



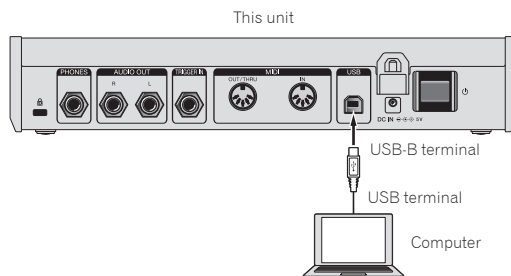
2 Set [MIDI Control Enable] of [GLOBAL SETTING] to [On].

3 Set [MIDI Channel] of [GLOBAL SETTING] to match the MIDI channel output from the external MIDI device.

4 Play with an external MIDI device.

## Connecting this unit to a computer and playing

1 Connect the [USB-B] terminal of this unit to a computer with a USB cable.



2 Set [MIDI Control Enable] of [GLOBAL SETTING] to [On].

3 Set [MIDI Out Select] of [GLOBAL SETTING] to [USB] or [MIDI + USB].

4 Set [MIDI Channel] of [GLOBAL SETTING] to match the MIDI channel output from a MIDI-compatible application in the computer.

5 Play with the MIDI-compatible application in the computer.

- When using the sequencer or arpeggiator of this unit, set [MIDI Seq/Arp Out] of [GLOBAL SETTING] to [On].

## Synchronizing and Playing this unit with an external MIDI device or computer

### Synchronizing using this unit as a master and an external MIDI device as a slave

1 Connect this unit to an external MIDI device or computer.

- For the detailed connections and setting method, see "Connecting this unit to an external MIDI device or computer and playing" above. It is necessary to output MIDI signals from this unit.

2 Set [MIDI Clock Mode] of [GLOBAL SETTING] to [Master].

3 Set [MIDI Clock Cable] of [GLOBAL SETTING] to the connection cable you have used.

- When connecting with a MIDI cable, set to [MIDI Port] and when connecting with a USB cable, set to [USB].

#### 4 Play using the sequencer or arpeggiator of this unit.

- The operations of play functions such as BPM and sequencer of the external MIDI device or MIDI compatible application in the computer synchronize with the BPM set on this unit.
- For the synchronizing settings of the external MIDI device, refer to the operating instructions for the device.

### Synchronizing using this unit as a slave and an external MIDI device as a master

#### 1 Connect this unit to an external MIDI device or computer.

- For the detailed connections and setting method, see "Connecting this unit to an external MIDI device or computer and playing" (page 26). It is necessary to output MIDI signals from the external MIDI device.

#### 2 Set [MIDI Clock Mode] of [GLOBAL SETTING] to [Slave], [Slave Thru] or [Slave No S/S].

- For the details for how each setting works, see "Changing the unit settings ([GLOBAL SETTING])" (page 21).
- If this unit is set as a slave, the [CLOCK TAP] button turns off. While this unit is receiving the external MIDI Timing Clock, the [CLOCK TAP] button flashes synchronizing with the MIDI Timing Clock.

#### 3 Set [MIDI Clock Cable] of [GLOBAL SETTING] to the connection cable you have used.

- When connecting with a MIDI cable, set to [MIDI Port] and when connecting with a USB cable, set to [USB].

#### 4 Play using the sequencer or arpeggiator of the external MIDI device or MIDI-compatible application in the computer.

- The operations of play functions such as BPM and sequencer of this unit synchronize with the BPM set on the external MIDI device or MIDI compatible application in the computer.
- For the synchronizing settings of the external MIDI device, refer to the manual of the device.

## Using the [TRIGGER IN] of this unit to control the play functions of this unit

By connecting a foot pedal or a device that sends an audio signal which works as a trigger signal to the [TRIGGER IN] of this unit, you can control the play functions of this unit such as sequencer, arpeggiator and the others. This offers you a variety of performance options.

There are four modes to control the play functions of this unit by [TRIGGER IN] input. The mode can be set in [Seq Jack Mode] of [GLOBAL SETTING].

Seq Jack Mode	Connected device (input signal)	Play function	Behavior
Pedal	Foot switch	Sequencer	Plays/stops the sequence.
		Arpeggiator	This does not affect the operation.
		Keyboard	This does not affect the operation.
	Audio signal (trigger signal)	Sequencer	Plays/stops the sequence.
		Arpeggiator	This does not affect the operation.
		Keyboard	This does not affect the operation.
Trigger	Foot switch	Sequencer	When the sequencer is On, advances one step each time you step on the foot switch.
		Arpeggiator	When the arpeggiator is On, plays each sound of the held notes each time you step on the foot switch according to the arpeggiator setting.
		Keyboard	This does not affect the operation.
	Audio signal (trigger signal)	Sequencer	When the sequencer is On, advances one step each time an audio signal is input.
		Arpeggiator	When the arpeggiator is On, plays each sound of the held notes each time an audio signal is input according to the arpeggiator setting.
		Keyboard	This does not affect the operation.
Gate	Foot switch	Sequencer	When the sequencer is On, plays the sequence while you are stepping on the foot switch.
		Arpeggiator	When the arpeggiator is On, the held notes are arpeggiated while you are stepping on the foot switch.
		Keyboard	The held notes are played when you step on the foot switch. The notes are played continuously (note-on state continues) if you keep stepping on the foot switch.
	Audio signal (trigger signal)	Sequencer	When the sequencer is On, plays the sequence while an audio signal is input. The sequence plays continuously when inputting a continuous sound.
		Arpeggiator	When the arpeggiator is On, the held notes are arpeggiated while an audio signal is input. The arpeggio plays continuously when inputting a continuous sound.
		Keyboard	The held notes are played when an audio signal is input. The notes are played continuously (note-on state continues) while a continuous sound is input.
Gate+Trigger	Foot switch	Sequencer	When the sequencer is On, advances one step each time you step on the foot switch.
		Arpeggiator	When the arpeggiator is On, plays each sound of the held notes each time you step on the foot switch depending on the arpeggiator setting.
		Keyboard	The held notes are played when you step on the foot switch. The notes are played continuously (note-on state continues) if you keep stepping on the foot switch.
	Audio signal (trigger signal)	Sequencer	When the sequencer is On, advances one step each time an audio signal is input.
		Arpeggiator	When the arpeggiator is On, plays each sound of the held notes each time an audio signal is input depending on the arpeggiator setting.
		Keyboard	The held notes are played when an audio signal is input. The notes are played continuously (note-on state continues) while a continuous sound is input.

- Depending on the polarity of the foot pedal used, it may not operate correctly. If necessary, change the setting of [Pedal Polarity] of [GLOBAL SETTING].
- When using an audio signal as a trigger signal, input a sound with sharp attack and decay like a pulse signal or click sound with a sufficiently high volume.

# MIDI implementation

This unit sends and receives MIDI data according to the settings selected in the [GLOBAL SETTING] menu. Check the following list to confirm the types of MIDI data that can be sent and received.

## MIDI Messages

### System Real Time Messages

Status	Explanation
0b1111 1000	MIDI Timing Clock

### Received Channel Messages

Status 1st Data Byte	2nd Data Byte	3rd Data Byte	Description
1000 nnnn	0kkkkkkk	0wwwww	Note Off. Velocity is ignored.
1001 nnnn	0kkkkkkk	0wwwww	Note On. Note off if wwww = 0.
1011 nnnn	0wwwww	0wwwww	Control Change
1100 nnnn	0wwwww		Program Change, 0-98 for programs 1-99 within current bank
1101 nnnn	0wwwww		Channel Pressure
1110 nnnn	0wwwww	0wwwww	Pitch Bend LS Byte (LSB) then MS Byte (MSB)

Where:	
0kkkkkkk =	Note Number 0-127
nnnn =	Channel Number 0 to 15 (MIDI channel 1 to 16) • Ignored if MIDI channel set to ALL.
0wwwww =	Value

### Received Controller Messages

Status 1st Data Byte	2nd Data Byte	3rd Data Byte	Description
1011 nnnn	0000 0001	0wwwww	Mod Wheel: directly assignable controller
1011 nnnn	0000 0100	0wwwww	Foot Controller: directly assignable controller
1011 nnnn	0000 0111	0wwwww	Volume: Combined with Master Volume and Voice Volume
1011 nnnn	0100 1010	0wwwww	Brightness: Added to low-pass filter cutoff frequency
1011 nnnn	0010 0000	0wwwww	Bank Select: 0 - 5 select user banks 1 - 5; 6 - 10 select factory banks 1 - 5; others ignored
1011 nnnn	0100 0000	0wwwww	Damper pedal: Holds envelopes in Sustain if 0100 0000 or higher
1011 nnnn	0111 1011	0wwwww	All Notes Off: Clear all MIDI notes
1011 nnnn	0111 1001	0wwwww	Reset All Controllers: Clears all MIDI controllers to 0, MIDI volume to maximum

Refer also to "MIDI Continuous Controllers (CC) Transmitted/Received" (page 33) and "Received NRPN Message Format" (page 29).

## Transmitted Channel Messages

Status 1st Data Byte	2nd Data Byte	3rd Data Byte	Description
1000 nnnn	0kkkkkkk	0	Note Off
1001 nnnn	0kkkkkkk	0vvvvvv	Note On
1011 nnnn	0vvvvvv	0vvvvvv	Control Change; see "Transmitted Controller Messages" below.
1100 nnnn	0vvvvvv		Program Change, 0-98 for programs 1-99 within current bank

Where:	
0kkkkkkk =	Note Number 0-127
nnnn =	Channel Number 0 to 15 (MIDI channel 1 to 16) • Ignored if MIDI channel set to ALL.
0vvvvvv =	Value

## Transmitted Controller Messages

Status 1st Data Byte	2nd Data Byte	3rd Data Byte	Description
1011 nnnn	0010 0000	0vvvvvv	Bank Select: 0-9 for banks 1-10
1011 nnnn	0000 0111	0vvvvvv	[VOLUME] control (knob)

Refer also to "MIDI Continuous Controllers (CC) Transmitted/Received" (page 33) and "Transmitted NRPN Message Format" below.

## NRPN (Non-Registered Parameter Number) Messages

### Transmitted NRPN Message Format

Status	Description
1011 nnnn	Control Change
011 0011	NRPN parameter number MSB CC
0vv vvv	Parameter Number MSB
0110 0010	NRPN parameter number LSB CC
0vv vvv	Parameter Number LSB
0000 0010	NRPN parameter value MSB CC
0vv vvv	Parameter Value MSB
0010 0110	NRPN parameter value LSB CC
0vv vvv	Parameter Value LSB

### Received NRPN Message Format

Status 1st Data Byte	2nd Data Byte	3rd Data Byte	Description
1011 nnnn	0110 0011	0vvvvvv	NRPN parameter number MSB CC
1011 nnnn	0110 0010	0vvvvvv	NRPN parameter number LSB CC
1011 nnnn	0000 0110	0vvvvvv	NRPN parameter value MSB CC
1011 nnnn	0010 0110	0vvvvvv	NRPN parameter value LSB CC
1011 nnnn	0110 0000		NRPN parameter value increment
1011 nnnn	0110 0001		NRPN parameter value decrement
1011 nnnn	0010 0101	1111111	RPN parameter number MSB CC - Reset NRPN parameter number (when both MSB and LSB received)
1011 nnnn	0010 0100	1111111	RPN parameter number LSB CC - Reset NRPN parameter number (when both MSB and LSB received)

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# Sysex Messages

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## Universal SysEx Device Inquiry

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Status	Description
1111 0000	System Exclusive (SysEx)
0111 1110	Non-realtime message
0vv vvv	If MIDI channel is set to 1-16, 0vv vvv must match (unless MIDI channel = ALL); always responds If 0vv vvv = 0111 1111
0000 0110	Inquiry message
0000 0001	Inquiry Request
1111 0111	End of exclusive (EOX)

---

## The Toraiz AS-1 responds with:

Status	Description
1111 0000	System Exclusive (SysEx)
0111 1110	Non-realtime message
0vv vvv	If MIDI channel = ALL, 0vv vvv = 0111 1111. Otherwise 0vv vvv = Channel number 0-15
0000 0110	Inquiry message
0000 0010	Inquiry Reply
0000 0000	Pioneer DJ ID (first byte)
0100 0000	Pioneer DJ ID (second byte)
0000 0101	Pioneer DJ ID (third byte)
0000 0000	Toraiz ID (first byte)
0000 0000	Toraiz ID (second byte)
0000 0001	Toraiz ID (third byte)
0000 1000	Toraiz ID (fourth byte)
0001 0000	Device ID
0jjj nnnn	Main Software version jjj - Minor rev; nnnn - Major rev
1111 0111	End of exclusive (EOX)

---

The Toraiz AS-1 will send out the program data in the format described in "Program Data Dump" (page 31).

---

## Request Program Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0000	Pioneer DJ ID (first byte)
0100 0000	Pioneer DJ ID (second byte)
0000 0101	Pioneer DJ ID (third byte)
0000 0000	Toraiz ID (first byte)
0000 0000	Toraiz ID (second byte)
0000 0001	Toraiz ID (third byte)
0000 1000	Toraiz ID (fourth byte)
0001 0000	Device ID
0000 0101	Request program transmit
0000 vvv	Bank Number, 0-9
0vv vvv	Program Number, 0-99
1111 0111	End of exclusive (EOX)

---

The Toraiz AS-1 will send out the current program edit buffer in the format described in "Program Edit Buffer Data Dump" (page 32).

## Request Program Edit Buffer Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0000	Pioneer DJ ID (first byte)
0100 0000	Pioneer DJ ID (second byte)
0000 0101	Pioneer DJ ID (third byte)
0000 0000	Toraiz ID (first byte)
0000 0000	Toraiz ID (second byte)
0000 0001	Toraiz ID (third byte)
0000 1000	Toraiz ID (fourth byte)
0001 0000	Device ID
0000 0110	Request program edit buffer transmit
1111 0111	End of exclusive (EOX)

The Toraiz AS-1 will send out the current values of Global Parameters in the format described in "Global Parameters Data Dump" (page 32).

## Request Global Parameter Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0000	Pioneer DJ ID (first byte)
0100 0000	Pioneer DJ ID (second byte)
0000 0101	Pioneer DJ ID (third byte)
0000 0000	Toraiz ID (first byte)
0000 0000	Toraiz ID (second byte)
0000 0001	Toraiz ID (third byte)
0000 1000	Toraiz ID (fourth byte)
0001 0000	Device ID
0000 1110	Request global parameter transmit
1111 0111	End of exclusive (EOX)

## Program Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0000	Pioneer DJ ID (first byte)
0100 0000	Pioneer DJ ID (second byte)
0000 0101	Pioneer DJ ID (third byte)
0000 0000	Toraiz ID (first byte)
0000 0000	Toraiz ID (second byte)
0000 0001	Toraiz ID (third byte)
0000 1000	Toraiz ID (fourth byte)
0001 0000	Device ID
0000 0010	Program Data
0000 vvv	Bank number 0-9
0vv vvv	Program number 0-99
0vv vvv	1024 bytes expanded to 1171 MIDI bytes in "packed MS bit" format.
1111 0111	End of exclusive (EOX)

---

## Program Edit Buffer Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0000	Pioneer DJ ID (first byte)
0100 0000	Pioneer DJ ID (second byte)
0000 0101	Pioneer DJ ID (third byte)
0000 0000	Toraiz ID (first byte)
0000 0000	Toraiz ID (second byte)
0000 0001	Toraiz ID (third byte)
0000 1000	Toraiz ID (fourth byte)
0001 0000	Device ID
0000 0011	Edit Buffer Data
0vvv vvv	1024 bytes expanded to 1171 MIDI bytes in "packed MS bit" format.
1111 0111	End of exclusive (EOX)

---

## Global Parameters Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0000	Pioneer DJ ID (first byte)
0100 0000	Pioneer DJ ID (second byte)
0000 0101	Pioneer DJ ID (third byte)
0000 0000	Toraiz ID (first byte)
0000 0000	Toraiz ID (second byte)
0000 0001	Toraiz ID (third byte)
0000 1000	Toraiz ID (fourth byte)
0001 0000	Device ID
0000 1111	Global parameter data
0vvv vvv	54 nibbles (LSB then MSB) for 27 Global parameters
1111 0111	End of exclusive (EOX)



## MIDI Continuous Controllers (CC) Transmitted/Received

This unit's [GLOBAL SETTING] and MIDI Continuous Controllers (CC) are related as follows.

- When [MIDI Param Send] is set to [CC], this unit transmits CC.
- When [MIDI Param Rcv] is set to [CC], this unit recognizes CC and receives from CC.

The following table details how MIDI Continuous Controllers (CC) are mapped to this unit's controls.

CC	Parameter
3	V_BPM,
5	V_GLIDE_MODE,
8	V_OSC_1_SUB_LEVEL,
39	V_VOICE_VOLUME,
40	V_ENV_VCA_AMT,
41	V_ENV_VCA_VEL_ON_OFF,
43	V_ENV_VCA_ATT,
44	V_ENV_VCA_DEC,
45	V_ENV_VCA_SUS,
46	V_ENV_VCA_REL,
47	V_ENV_LOWPASS_AMT,
50	V_ENV_FILTER_ATT,
51	V_ENV_FILTER_DEC,
52	V_ENV_FILTER_SUS,
53	V_ENV_FILTER_REL,
54	V_ENV_HIGHPASS_AMT,
58	M_ARP_ON_OFF,
59	M_ARP_MODE,
60	M_ARP_RANGE,
62	M_ARP_TIME_SIG,
65	V_GLIDE_ON_OFF,
67	V_OSC_1_FREQ,
69	V_OSC_1_LEVEL,
70	V_OSC_1_SHAPE,
71	V_OSC_1_PULSE_WIDTH,
75	V_OSC_2_FREQ,
76	V_OSC_2_FREQ_FINE,
77	V_OSC_2_LEVEL,
78	V_OSC_2_SHAPE,
79	V_OSC_2_PULSE_WIDTH,
102	V_LOWPASS_FREQ,
103	V_LOWPASS_RESONANCE,
104	V_LOWPASS_KEY_AMT,
105	V_LOWPASS_VEL_ON,
106	V_HIGHPASS_FREQ,
107	V_HIGHPASS_RESONANCE,
108	V_HIGHPASS_KEY_AMT,
109	V_HIGHPASS_VEL_ON,

## Program Parameter Data

The following table lists Toraja AS-1's program parameters.

NRPN	Value	Parameter
0	0-60	V_OSC_1_FREQ,
1	0-1	V_OSC_1_SYNC,
2	0-127	V_OSC_1_LEVEL,
3	0-254	V_OSC_1_SHAPE,
4	0-255	V_OSC_1_PULSE_WIDTH,
5	0-60	V_OSC_2_FREQ,
6	0-254	V_OSC_2_FREQ_FINE,
7	0-127	V_OSC_2_LEVEL,
8	0-254	V_OSC_2_SHAPE,
9	0-255	V_OSC_2_PULSE_WIDTH,
10	0-1	V_OSC_2_LOW_FREQ,
11	0-1	V_OSC_2_KEY_ON_OFF,
27	0-127	V_OSC_1_SUB_LEVEL,
28	0-3	V_GLIDE_MODE,
29	0-1	V_GLIDE_ON_OFF,
30	0-127	V_GLIDE_RATE,
31	0-12	V_PBEND_RANGE,
32	0-127	V_NOISE_LEVEL,
33	0-127	V_SLOP,
45	0-164	V_LOWPASS_FREQ,
46	0-255	V_LOWPASS_RESONANCE,
47	0-2	V_LOWPASS_KEY_AMT,
48	0-1	V_LOWPASS_VEL_ON,
49	0-127	V_HIGHPASS_FREQ,
50	0-255	V_HIGHPASS_RESONANCE,
51	0-2	V_HIGHPASS_KEY_AMT,
52	0-1	V_HIGHPASS_VEL_ON,
62	0-127	V_VOICE_VOLUME,
66	0-127	V_ENV_VCA_AMT,
67	0-127	V_ENV_VCA_ATT,
68	0-127	V_ENV_VCA_DEC,
69	0-127	V_ENV_VCA_SUS,
70	0-127	V_ENV_VCA_REL,
71	0-1	V_ENV_VCA_VEL_ON_OFF,
77	0-254	V_ENV_LOWPASS_AMT,
78	0-127	V_ENV_FILTER_ATT,
79	0-127	V_ENV_FILTER_DEC,
80	0-127	V_ENV_FILTER_SUS,
81	0-127	V_ENV_FILTER_REL,
82	0-127	V_ENV_HIGHPASS_AMT,
88	0-255	V_LFO_FREQ,
89	0-255	V_LFO_INITIAL_AMT,
90	0-4	V_LFO_SHAPE,
91	0-1	V_LFO_EXT_SYNC,
93	0-1	V_LFO_FREQ_1_DEST_ON_OFF,
94	0-1	V_LFO_FREQ_2_DEST_ON_OFF,
95	0-1	V_LFO_PW_1_2_DEST_ON_OFF,
96	0-1	V_LFO_AMP_DEST_ON_OFF,
97	0-1	V_LFO_LOWPASS_DEST_ON_OFF,
98	0-1	V_LFO_HIGHPASS_DEST_ON_OFF,
109	0-254	V_PRESSURE_AMT,
110	0-1	V_PRESSURE_FREQ_1_DEST_ON_OFF,
111	0-1	V_PRESSURE_FREQ_2_DEST_ON_OFF,
112	0-1	V_PRESSURE_LOWPASS_DEST_ON_OFF,
113	0-1	V_PRESSURE_HIGHPASS_DEST_ON_OFF,
114	0-1	V_PRESSURE_VCA_DEST_ON_OFF,
115	0-1	V_PRESSURE_LFO_AMT_DEST_ON_OFF,

NRPN	Value	Parameter
119	0-3	V_FX_1_SELECT,
120	0-127	V_FX_1_MIX,
121	0-255	V_FX_1_PARAM_1,
122	0-127	V_FX_1_PARAM_2,
123	0-1	V_FX_1_SYNC,
124	0-10	V_FX_1_SYNC_RATE,
127	0-4	V_FX_2_SELECT,
128	0-127	V_FX_2_MIX,
129	0-127	V_FX_2_PARAM_1,
130	0-127	V_FX_2_PARAM_2,
135	0-1	V_FX_ON_OFF,
143	0-254	V_POLYMOD_FILTER_ENV_AMT,
144	0-254	V_POLYMOD_OSC_2_AMT,
145	0-1	V_POLYMOD_FREQ_1_DEST_ON_OFF,
146	0-1	V_POLYMOD_SHAPE_1_DEST_ON_OFF,
147	0-1	V_POLYMOD_PW_1_DEST_ON_OFF,
148	0-1	V_POLYMOD_LOWPASS_DEST_ON_OFF,
149	0-1	V_POLYMOD_HIGHPASS_DEST_ON_OFF,
158	0-5	V_KEY_MODE,
160	0-1	M_ARP_ON_OFF,
161	0-4	M_ARP_MODE,
162	0-2	M_ARP_RANGE,
163	0-9	M_ARP_TIME_SIG,
167	30-250	V_BPM,
168	0-1	M_SEQ_ON_OFF,
170	0-6	M_SEQ_LENGTH,
172	0-1	M_SEQ_RECORD_ON_OFF,
180	0-254	V_SLIDER_OSC_FREQ_1_AMT;
181	0-254	V_SLIDER_OSC_FREQ_2_AMT;
182	0-254	V_SLIDER_LFO_AMT;
183	0-254	V_SLIDER_FX_1_MIX_AMT;
184	0-254	V_SLIDER_FX_2_MIX_AMT;
185	0-254	V_SLIDER_LPF_AMT;
186	0-254	V_SLIDER_HPF_AMT;
256	12-108	M_SEQ_STEP_1_NOTE_1,
257	12-108	M_SEQ_STEP_2_NOTE_1,
258	12-108	M_SEQ_STEP_3_NOTE_1,
259	12-108	M_SEQ_STEP_4_NOTE_1,
260	12-108	M_SEQ_STEP_5_NOTE_1,
261	12-108	M_SEQ_STEP_6_NOTE_1,
262	12-108	M_SEQ_STEP_7_NOTE_1,
263	12-108	M_SEQ_STEP_8_NOTE_1,
264	12-108	M_SEQ_STEP_9_NOTE_1,
265	12-108	M_SEQ_STEP_10_NOTE_1,
266	12-108	M_SEQ_STEP_11_NOTE_1,
267	12-108	M_SEQ_STEP_12_NOTE_1,
268	12-108	M_SEQ_STEP_13_NOTE_1,
269	12-108	M_SEQ_STEP_14_NOTE_1,
270	12-108	M_SEQ_STEP_15_NOTE_1,
271	12-108	M_SEQ_STEP_16_NOTE_1,
272	12-108	M_SEQ_STEP_17_NOTE_1,
273	12-108	M_SEQ_STEP_18_NOTE_1,
274	12-108	M_SEQ_STEP_19_NOTE_1,
275	12-108	M_SEQ_STEP_20_NOTE_1,
276	12-108	M_SEQ_STEP_21_NOTE_1,
277	12-108	M_SEQ_STEP_22_NOTE_1,
278	12-108	M_SEQ_STEP_23_NOTE_1,
279	12-108	M_SEQ_STEP_24_NOTE_1,
280	12-108	M_SEQ_STEP_25_NOTE_1,
281	12-108	M_SEQ_STEP_26_NOTE_1,
282	12-108	M_SEQ_STEP_27_NOTE_1,

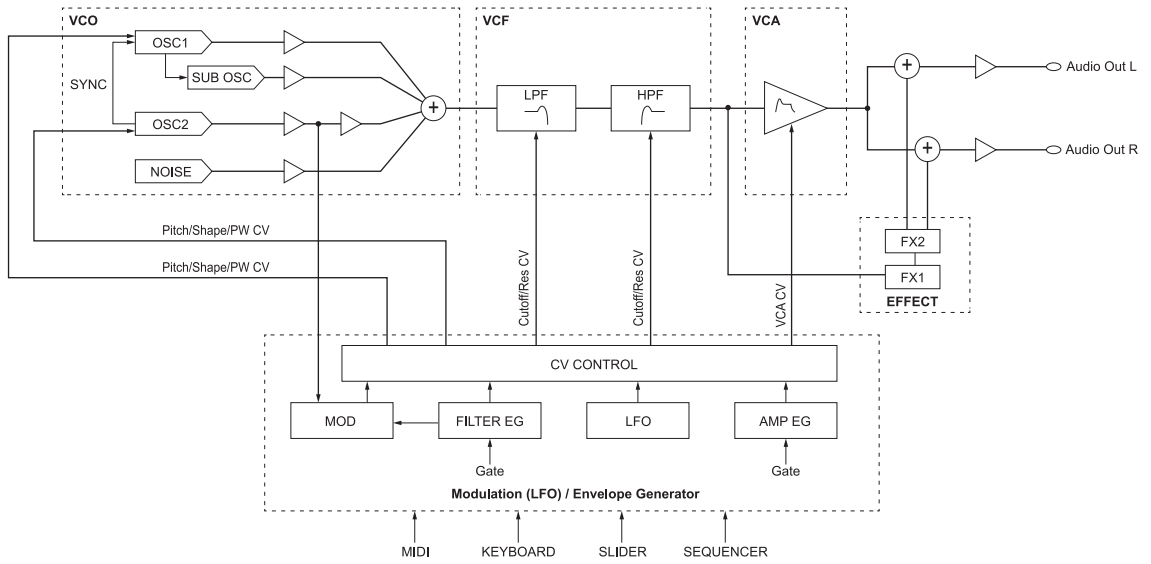
NRPN	Value	Parameter
283	12-108	M_SEQ_STEP_28_NOTE_1,
284	12-108	M_SEQ_STEP_29_NOTE_1,
285	12-108	M_SEQ_STEP_30_NOTE_1,
286	12-108	M_SEQ_STEP_31_NOTE_1,
287	12-108	M_SEQ_STEP_32_NOTE_1,
288	12-108	M_SEQ_STEP_33_NOTE_1,
289	12-108	M_SEQ_STEP_34_NOTE_1,
290	12-108	M_SEQ_STEP_35_NOTE_1,
291	12-108	M_SEQ_STEP_36_NOTE_1,
292	12-108	M_SEQ_STEP_37_NOTE_1,
293	12-108	M_SEQ_STEP_38_NOTE_1,
294	12-108	M_SEQ_STEP_39_NOTE_1,
295	12-108	M_SEQ_STEP_40_NOTE_1,
296	12-108	M_SEQ_STEP_41_NOTE_1,
297	12-108	M_SEQ_STEP_42_NOTE_1,
298	12-108	M_SEQ_STEP_43_NOTE_1,
299	12-108	M_SEQ_STEP_44_NOTE_1,
300	12-108	M_SEQ_STEP_45_NOTE_1,
301	12-108	M_SEQ_STEP_46_NOTE_1,
302	12-108	M_SEQ_STEP_47_NOTE_1,
303	12-108	M_SEQ_STEP_48_NOTE_1,
304	12-108	M_SEQ_STEP_49_NOTE_1,
305	12-108	M_SEQ_STEP_50_NOTE_1,
306	12-108	M_SEQ_STEP_51_NOTE_1,
307	12-108	M_SEQ_STEP_52_NOTE_1,
308	12-108	M_SEQ_STEP_53_NOTE_1,
309	12-108	M_SEQ_STEP_54_NOTE_1,
310	12-108	M_SEQ_STEP_55_NOTE_1,
311	12-108	M_SEQ_STEP_56_NOTE_1,
312	12-108	M_SEQ_STEP_57_NOTE_1,
313	12-108	M_SEQ_STEP_58_NOTE_1,
314	12-108	M_SEQ_STEP_59_NOTE_1,
315	12-108	M_SEQ_STEP_60_NOTE_1,
316	12-108	M_SEQ_STEP_61_NOTE_1,
317	12-108	M_SEQ_STEP_62_NOTE_1,
318	12-108	M_SEQ_STEP_63_NOTE_1,
319	12-108	M_SEQ_STEP_64_NOTE_1,
320	0-127	M_SEQ_STEP_1_VEL_1,
321	0-127	M_SEQ_STEP_2_VEL_1,
322	0-127	M_SEQ_STEP_3_VEL_1,
323	0-127	M_SEQ_STEP_4_VEL_1,
324	0-127	M_SEQ_STEP_5_VEL_1,
325	0-127	M_SEQ_STEP_6_VEL_1,
326	0-127	M_SEQ_STEP_7_VEL_1,
327	0-127	M_SEQ_STEP_8_VEL_1,
328	0-127	M_SEQ_STEP_9_VEL_1,
329	0-127	M_SEQ_STEP_10_VEL_1,
330	0-127	M_SEQ_STEP_11_VEL_1,
331	0-127	M_SEQ_STEP_12_VEL_1,
332	0-127	M_SEQ_STEP_13_VEL_1,
333	0-127	M_SEQ_STEP_14_VEL_1,
334	0-127	M_SEQ_STEP_15_VEL_1,
335	0-127	M_SEQ_STEP_16_VEL_1,
336	0-127	M_SEQ_STEP_17_VEL_1,
337	0-127	M_SEQ_STEP_18_VEL_1,
338	0-127	M_SEQ_STEP_19_VEL_1,
339	0-127	M_SEQ_STEP_20_VEL_1,
340	0-127	M_SEQ_STEP_21_VEL_1,
341	0-127	M_SEQ_STEP_22_VEL_1,
342	0-127	M_SEQ_STEP_23_VEL_1,
343	0-127	M_SEQ_STEP_24_VEL_1,

NRPN	Value	Parameter
344	0-127	M_SEQ_STEP_25_VEL_1;
345	0-127	M_SEQ_STEP_26_VEL_1;
346	0-127	M_SEQ_STEP_27_VEL_1;
347	0-127	M_SEQ_STEP_28_VEL_1;
348	0-127	M_SEQ_STEP_29_VEL_1;
349	0-127	M_SEQ_STEP_30_VEL_1;
350	0-127	M_SEQ_STEP_31_VEL_1;
351	0-127	M_SEQ_STEP_32_VEL_1;
352	0-127	M_SEQ_STEP_33_VEL_1;
353	0-127	M_SEQ_STEP_34_VEL_1;
354	0-127	M_SEQ_STEP_35_VEL_1;
355	0-127	M_SEQ_STEP_36_VEL_1;
356	0-127	M_SEQ_STEP_37_VEL_1;
357	0-127	M_SEQ_STEP_38_VEL_1;
358	0-127	M_SEQ_STEP_39_VEL_1;
359	0-127	M_SEQ_STEP_40_VEL_1;
360	0-127	M_SEQ_STEP_41_VEL_1;
361	0-127	M_SEQ_STEP_42_VEL_1;
362	0-127	M_SEQ_STEP_43_VEL_1;
363	0-127	M_SEQ_STEP_44_VEL_1;
364	0-127	M_SEQ_STEP_45_VEL_1;
365	0-127	M_SEQ_STEP_46_VEL_1;
366	0-127	M_SEQ_STEP_47_VEL_1;
367	0-127	M_SEQ_STEP_48_VEL_1;
368	0-127	M_SEQ_STEP_49_VEL_1;
369	0-127	M_SEQ_STEP_50_VEL_1;
370	0-127	M_SEQ_STEP_51_VEL_1;
371	0-127	M_SEQ_STEP_52_VEL_1;
372	0-127	M_SEQ_STEP_53_VEL_1;
373	0-127	M_SEQ_STEP_54_VEL_1;
374	0-127	M_SEQ_STEP_55_VEL_1;
375	0-127	M_SEQ_STEP_56_VEL_1;
376	0-127	M_SEQ_STEP_57_VEL_1;
377	0-127	M_SEQ_STEP_58_VEL_1;
378	0-127	M_SEQ_STEP_59_VEL_1;
379	0-127	M_SEQ_STEP_60_VEL_1;
380	0-127	M_SEQ_STEP_61_VEL_1;
381	0-127	M_SEQ_STEP_62_VEL_1;
382	0-127	M_SEQ_STEP_63_VEL_1;
383	0-127	M_SEQ_STEP_64_VEL_1;
1024	0-100	V_GLOBAL_MASTER_FINE;
1025	0-24	V_GLOBAL_MASTER_COARSE;
1026	0-16	V_GLOBAL_MIDI_CHANNEL;
1027	0-4	V_GLOBAL_MIDI_CLOCK_MODE;
1028	0-1	V_GLOBAL_MIDI_CLOCK_CABLE;
1029	0-2	V_GLOBAL_MIDI_PARAM_SEND;
1030	0-2	V_GLOBAL_MIDI_PARAM_RCV;
1031	0-1	V_GLOBAL_MIDI_CONTROL_ENABLE;
1032	0-1	V_GLOBAL_MIDI_SYSEX_CABLE;
1033	0-2	V_GLOBAL_MIDI_OUT_SELECT;
1034	0-1	V_GLOBAL_MIDI_OUT_THRU;
1035	0-1	V_GLOBAL_LOCAL_CONTROL;
1037	0-2	V_GLOBAL_POT_MODE;
1041	0-3	V_GLOBAL_SEQ_JACK_MODE;
1042	0-1	V_GLOBAL_PEDAL_POLARITY;
1043	0-1	V_GLOBAL_MONO_STEREO;
1044	0-16	V_GLOBAL_ALTERNATE_TUNING;
1045	0-21	V_GLOBAL_SCALE_MODE;
1046	0-1	V_GLOBAL_MIDI_SEQ_OUT;
1047	0-1	V_GLOBAL_SCREEN_SAVER;
1049	0-9	V_GLOBAL_KEY_SENSITIVITY;

NRPN	Value	Parameter
1050	0-99	V_GLOBAL_QUICK_PROGRAM_1_PRGM_SELECT;
1051	0-99	V_GLOBAL_QUICK_PROGRAM_2_PRGM_SELECT;
1052	0-99	V_GLOBAL_QUICK_PROGRAM_3_PRGM_SELECT;
1053	0-99	V_GLOBAL_QUICK_PROGRAM_4_PRGM_SELECT;
1054	0-99	V_GLOBAL_QUICK_PROGRAM_5_PRGM_SELECT;
1055	0-99	V_GLOBAL_QUICK_PROGRAM_6_PRGM_SELECT;
1056	0-99	V_GLOBAL_QUICK_PROGRAM_7_PRGM_SELECT;
1057	0-99	V_GLOBAL_QUICK_PROGRAM_8_PRGM_SELECT;
1058	0-99	V_GLOBAL_QUICK_PROGRAM_9_PRGM_SELECT;
1059	0-99	V_GLOBAL_QUICK_PROGRAM_10_PRGM_SELECT;
1060	0-99	V_GLOBAL_QUICK_PROGRAM_11_PRGM_SELECT;
1061	0-99	V_GLOBAL_QUICK_PROGRAM_12_PRGM_SELECT;
1062	0-99	V_GLOBAL_QUICK_PROGRAM_13_PRGM_SELECT;
1063	0-9	V_GLOBAL_QUICK_PROGRAM_1_BANK_SELECT;
1064	0-9	V_GLOBAL_QUICK_PROGRAM_2_BANK_SELECT;
1065	0-9	V_GLOBAL_QUICK_PROGRAM_3_BANK_SELECT;
1066	0-9	V_GLOBAL_QUICK_PROGRAM_4_BANK_SELECT;
1067	0-9	V_GLOBAL_QUICK_PROGRAM_5_BANK_SELECT;
1068	0-9	V_GLOBAL_QUICK_PROGRAM_6_BANK_SELECT;
1069	0-9	V_GLOBAL_QUICK_PROGRAM_7_BANK_SELECT;
1070	0-9	V_GLOBAL_QUICK_PROGRAM_8_BANK_SELECT;
1071	0-9	V_GLOBAL_QUICK_PROGRAM_9_BANK_SELECT;
1072	0-9	V_GLOBAL_QUICK_PROGRAM_10_BANK_SELECT;
1073	0-9	V_GLOBAL_QUICK_PROGRAM_11_BANK_SELECT;
1074	0-9	V_GLOBAL_QUICK_PROGRAM_12_BANK_SELECT;
1075	0-9	V_GLOBAL_QUICK_PROGRAM_13_BANK_SELECT;
1152	0-1	V_LOCK_SEQUENCE_ON_OFF;

# Block diagram

## Block diagram (signal flow diagram)



# Additional information

## Troubleshooting

- If you think that there is something wrong with this unit, check the items below and access the Pioneer DJ site and check [FAQ] for the [TORAIZ AS-1].  
<http://pioneerdj.com/>  
 Sometimes the problem may lie in another component. Inspect the other components and electrical appliances being used. If the problem cannot be rectified, ask your nearest Pioneer authorized service center or your dealer to carry out repair work.
- This unit may not operate properly due to static electricity or other external influences. In this case, proper operation may be restored by turning the power off, then turning the power back on.
- If the system operation with a connected external device(s) or the operation of this unit is unstable, try resetting the related item(s) after you initialize [Global Setting] by performing [Reset Globals] of the [GLOBAL SETTING] menu.

Problem	Check	Remedy
The power of the unit does not turn on. No indicator lights up.	Are the power cord and the AC adaptor connected properly?	Connect the included power cord to the wall outlet properly. Connect the included power cord to the included AC adaptor properly. Connect the included AC adapter's connection cable to this unit properly.
	Is the [⏻] button switched on?	Press the [⏻] button to turn on the unit.
A button indicator(s) is/are lit but nothing appears on the display.	Isn't the screen saver working?	Operate any control and button.
	Haven't you pressed the [⏻] button on the rear panel while pressing any button on the control panel?	Turn off the unit and turning it on again without pressing any button other than the [⏻] button.
No sound or low sound	Is the [VOLUME] control on the control panel set in the proper position? Is the level or volume of each category/parameter set properly?	Turn the [VOLUME] on the control panel to the proper position. Set the level or volume of each category/parameter to the proper value.
	Are the following set properly? • [LPF CUTOFF] and [HPF CUTOFF] controls on the control panel • [Cutoff] and [Key Amount] parameters of the [LOW-PASS FILTER] and [HIGH-PASS FILTER] categories	Set the following properly. • [LPF CUTOFF] and [HPF CUTOFF] controls on the control panel • [Cutoff] and [Key Amount] parameters of the [LOW-PASS FILTER] and [HIGH-PASS FILTER] categories
Distorted sound	Is the level or volume of each category/parameter set to proper value? Is the filter resonance set to proper value?	Set each category/parameter and filter resonance to proper values.
The sequencer and arpeggiator do not work. (Internal synchronous operation)	Is [MIDI Clock Mode] of the [GLOBAL SETTING] menu set to [Master] or [Off]?	Set [MIDI Clock Mode] to [Master] or [Off].
The sequencer and arpeggiator do not work. (External synchronous operation)	Is a MIDI cable properly connected?	Connect the MIDI OUT terminal of the external device and [MIDI IN] of this unit using a MIDI cable properly.
	Is MIDI clock sent from an external MIDI device?	Check that the external MIDI device is set to master mode.
	Is [MIDI Clock Cable] of the [GLOBAL SETTING] menu set properly?	Set [MIDI Clock Cable] to [MIDI Port] or [USB], whichever receives MIDI Clock.
Controls and buttons on the control panel do not work even if you turn them right or left.	Is [Local Control] of the [GLOBAL SETTING] menu set to [On]?	Set [Local Control] to [On].
MIDI SysEx (system exclusive) data cannot be sent nor received.	Is a MIDI cable properly connected?	Connect an external MIDI device and [MIDI] terminals of this unit using MIDI cables properly.
	Is a USB cable properly connected?	Connect you PC and the [USB-B] terminal of this unit directly using a USB cable which conforms to USB 2.0. USB hubs cannot be used.
	Is [MIDI Sysex Cable] of the [GLOBAL SETTING] menu properly set?	Set [MIDI Sysex Cable] to [MIDI Port] or [USB] properly, whichever sends and receives SysEx data.
	Is [MIDI Out Select] of the [GLOBAL SETTING] menu properly set?	Set [MIDI Out Select] to [MIDI Port] or [USB] properly, whichever sends and receives SysEx data.
Tuning is off.	Is [Master Coarse] or [Master Fine] of the [GLOBAL SETTING] menu properly set?	Set [Master Coarse] or [Master Fine] to the proper value.
	Did you perform calibration?	Perform calibration by selecting [Calibrate] in the [GLOBAL SETTING] menu at least ten minutes after the unit has been turned on.
	Is the slider in latch mode and pitch bend working?	If the [LATCH] button is lit, press the [LATCH] button to turn off the latch mode.
Keyboard operation is unstable. — Sound comes out even if you do not touch the keyboard. — The range where sound comes out is narrow.	Is [Keys Sens] of the [GLOBAL SETTING] menu set properly?	Set [Keys Sens] to a proper value.
	Haven't you pressed the [⏻] button on the rear panel while touching any keyboard key?	Turn off the unit and turning it on again by pressing the [⏻] button without touching any keyboard key nor slider. • The TORAIZ AS-1's keyboard is an electrostatic capacitive touch pad and calibration for the keyboard touch sensitivity is performed when you turn on the unit.

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## Precautions regarding our repair services

- When we repair your unit, we may need to reset the unit to its factory defaults, depending on the condition of the unit. Since we do not back up your settings prior to repair, we recommend that you back up your original settings (such as your edited programs) as System Exclusive files via MIDI interface. To do this, use a DAW or other MIDI Utility software that can transmit and receive MIDI System Exclusive messages.

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## Specifications

### AC adapter

Power.....	AC 100 V to 240 V, 50 Hz/60 Hz
Rated current .....	0.4 A
Rated output.....	DC 5 V, 2 A
Power consumption (standby) .....	0.075 W

### General - Main Unit

Power consumption.....	DC 5 V, 1500 mA
Main unit weight .....	1.4 kg (3.1 lbs.)
Max. dimensions .....	267.4 mm (width) x 68.6 mm (height) x 177.7 mm (depth) (10.5 in. (width) x 2.7 in. (height) x 7.0 in. (depth))
Tolerable operating temperature .....	+5 °C to +35 °C (+41 °F to +95 °F)
Tolerable operating humidity .....	5 % to 85 % (no condensation)

### Input/Output terminals

#### AUDIO OUT R output terminal

1/4" TS jack .....	1 set
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#### AUDIO OUT L output terminal

1/4" TS jack .....	1 set
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#### PHONES output terminal

1/4" stereo phone jack .....	1 set
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#### MIDI OUT/THRU output terminal

5P DIN .....	1 set
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#### MIDI IN input terminal

5P DIN .....	1 set
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#### TRIGGER IN input terminal

1/4" TS jack .....	1 set
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#### USB terminal

B type.....	1 set
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- The specifications and design of this product are subject to change without notice.

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<DR11434-A>