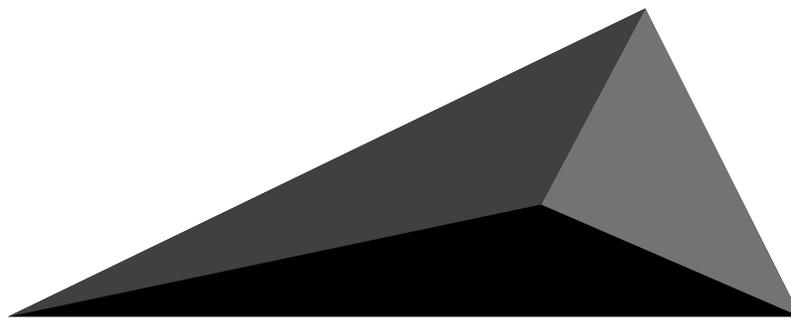# MOSS-TRI
DSP Synthesizer Option
User's Guide

T R I N I T Y
M U S I C   W O R K S T A T I O N   D R S

TRINITY/TRINITY V3/TRINITY V3 pro/TRINITY V3 proX
TRINITY plus/TRINITY pro/TRINITY proX

Access

Advanced Control Combined Synthesis System

Moss

Multi Oscillator Synthesis System

◀ TouchView
Graphical User Interface

KORG

Ⓔ ①

Contents

1. Introduction

Thank you for purchasing **the MOSS-TRI DSP Synthesizer Option**. To ensure long and trouble-free enjoyment, please read this user's guide carefully and use the product correctly.

Before you use this product, be sure to read the "Safety precautions" found at the beginning of the Parameter Guide.

This guide explains the **bank M** parameters which are added when the **MOSS-TRI DSP Synthesizer Option** is installed (**pre-installed in the Trinity V3 series**). For details on parameters other than **bank M**, refer to your Parameter Guide, Basic Guide, and Effect Guide.

When this option is installed (**pre-installed in the Trinity V3 series**), the bank S programs created by the **Solo-TRI option** will become invalid. However, explanations of **bank S** in the Parameter Guide, Basic Guide, and Effect Guide will still apply to **"bank M".**
Also, please refer to the **Voice Name List for V3** together with the Voice Name List which you already have.

In combination mode, **bank M** programs can be selected only for one timbre (☞page 4 in Parameter Guide). In Sequencer mode, **bank M** programs can be selected only for one track (☞ page 72 in Parameter Guide).

If a bank M program is selected for any timbre in a combination, the D-mod Src "Tempo" for the AMS or effect of the timbre program will use the Prog. Tempo setting (☞page 61 of this manual) (when the MIDI Clock Source is Internal).

In all modes, you must use an insertion effect when using bank M programs. If you do not use an insertion effect, the output will be low.

Features of MOSS-TRI

This is a **MOSS** (**Multi-Oscillator Synthesis System**) tone generator with six voices of polyphony. **Bank M** contains 64 sounds which use the **MOSS** tone generator. When the **PBS-TRI Flash ROM Option** is installed, an additional 64 sounds are added to **bank M**, bringing the total to 128 sounds. The **MOSS** tone generator parameters are divided into **voice, EG, LFO, effect** and **control** sections. The **voice** section contains an oscillator section and a filter section, etc.

- The oscillator section contains two oscillators (1, 2) which allow you to use 13 oscillator algorithms (standard, ring modulation, VPM, resonance, organ model, electric piano model etc.), in addition to a sub oscillator and a noise generator.

- The filter section provides two filters, each of which allows you to use one of five types of filtering, including a dual-band pass filter with two independent center frequencies that let you simulate human voice sounds or the body resonances of a violin or guitar.

This **voice** section can be modulated by five **EG** units and four **LFO** units to apply diverse changes in pitch, timbre and volume to the sound.

2. Bank M program structure

Program structure

Each program of **bank M** has the following structure.
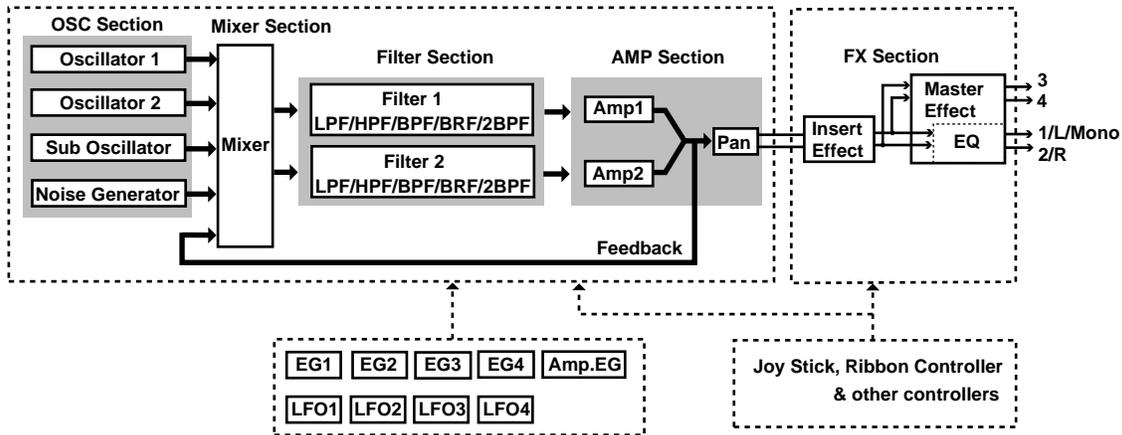
Oscillator section

This is the section which creates the waveform that is the basis of the sound.

These settings are made by the "Program Edit P1" and "Program Edit P2" parameters.

- **OSC 1, 2**

    Thirteen methods of sound production (i.e., thirteen oscillator types) are provided. Two of these oscillator types can be used together, and settings made to specify the basic pitch, etc. However depending on the oscillator type, only one oscillator may be available.

    These settings are made by the "1-2: OSC Basic," "1-3: OSC 1 Pitch," "1-4: OSC 2 Pitch," and "2-1: OSC" parameters.

- **Sub oscillator**

    This lets you use one of four types of basic waveform. Pitch-related settings can be made in the same way as OSC 1 and 2.

    These settings are made by the "1-5: Sub Pitch" and "2-2: Sub/Noise" parameters.

- **Noise generator**

    This generates white noise. The noise can be sent through a multi-mode filter (low pass filter, high pass filter, band pass filter).

    These settings are made by the "2-2: Sub/Noise" parameters.

Mixer section

The output of oscillators 1 and 2, the sub oscillator, and the noise generator are mixed with the feedback from the amp section, and output to multi-mode filters 1 and 2 (the filter section).

These settings are made by the "3-1: Mixer" parameters.

Filter section

This section modifies the waveform by attenuating or emphasizing specific portions of the frequency spectrum. It contains two multi-mode filters. Each filter can be set to one of the following types: low pass filter, high pass filter, band pass filter, band reject filter, or dual band pass filter. This lets you modify the brightness of the sound. You can also select the way in which the two filters will be connected with the mixer section and amp section.

These settings are made by the "3-2: Filter 1," "3-3: Filter 1 SUB," "3-4: Filter 2," and "3-5: Filter 2 SUB" parameters.

Amp section

This section modifies the volume of the output from the filter section. It contains two independent amplifiers. The signal which is input to each amplifier will depend on how the two filters are connected. The amp section also contains an amplitude envelope generator (**Amp EG**) which controls the amp.

These settings are made by the "4-1: Amp" and "4-2: Amp EG" parameters.

Effect section

This section applies effects to the signal which is output from the amp section. It has the same parameter structure as the programs of other banks.

These settings are made by the "Program Edit P7" and "Program Edit P8" parameters.

EG section

This section provides four general-purpose envelope generator (**EG**) units. The four **EG**'s for which settings are made in the **EG** section can be used as modulation sources for the parameters of each section, in order to apply time-variant change to the sound.

These settings are made by the "Program Edit P5" parameters.

LFO section

This section provides four general-purpose **LFO** units. The four **LFO**'s for which settings are made in the **LFO** section can be used as modulation sources for the parameters of each section, in order to apply cyclic change to the sound.

These settings are made by the "Program Edit P6" parameters.

Program basic section

Settings are made here for the program name, category, scale, key assign, keyboard, and the control nctions (joystick, ribbon controller, etc.).

These settings are made by the "1-1: Prog Basic" parameters.

Editing

Bank M programs are similar to **bank A** and **bank B** programs, in the respect that they can be edited in Program Play mode or by using the Performance Editor. One method to try is to use an existing program which resembles the desired sound, and use Program Edit mode to edit the parametes.

The **filter**, **amp**, **effect**, **EG** and **LFO** sections will function in the same way as for **banks** they do in and **B**, but the display page structure and the parameters are different (☞ "3. Parameters" in this manual).

The operation and parameters of the **oscillator** and **mixer sections** are unique to **bank M** programs.

Characteristics of each oscillator

For **bank M** sounds, **OSC 1** provides thirteen oscillator types (methods of sound generation) and **OSC 2** provides nine types. In Program Edit P1 "1-2: OSC Basic" you can select one of these types for each oscillator, to specify the combination.

If **OSC 1** is set to an oscillator type of **01:Standard** to **09:Electric Piano Model**, you will also be able to select an oscillator type of **01:Standard** to **09:Electric Piano Model** for **OSC 2**. If **OSC 1** is set to an oscillator type of **10:Brass Model** to **13: Bowed String Model**, **OSC 2** will not be available for use.

01: Standard OSC

This simulates the oscillator of an analog synthesizer. It can produce the same effects as an analog synthesizer, such as pulse width modulation (☞ page 14 of this manual).

02: Comb Filter OSC

This oscillator creates pitched sound from noise or an impulse. It can create a wide variety of sounds — not only noisy sounds, but also sounds ranging from synth-bass to strings (☞page 7 of this manual).

03: VPM OSC (Variable Phase Modulation OSC)

This oscillator uses phase modulation to create overtones. By modulating the phase of two oscillators and using a wave shaping table to process the sound, rich overtones can be produced (☞page 19 of this manual)

04: Resonance OSC

This oscillator uses four tunable filters which are set up in series. Noise is input through the filter bank for very ethereal sounds (☞page 21 of this manual).

05: Ring Modulation OSC - This oscillator multiplies the modulator and carrier and outputs the resultant signal.

06: Cross Modulation OSC - This oscillator uses a modulator to frequency-modulate a carrier.

07: Sync Modulation OSC (oscillator sync)

These are special oscillators which simulate the effect of two oscillators which are used to modulate each other, which was a technique that was possible on analog synthesizers. These are especially suitable for producing sounds that are rich in overtones, such as bells, metallic sounds or gongs (☞page 23, 24, 25 of this manual).

08: Organ Model

This simulates a drawbar organ with three drawbars (when one oscillator is used) or six drawbars (when two oscillators are used) (☞page 26 of this manual). Since each drawbar can use one of four types of waveform, a wide range of tones can be produced.

09: Electric Piano Model

This is a physical model which simulates a warm, vintage electric piano sound (☞page 8 of this manual).

10: Brass Model

This is a physical model which simulates a brass instrument such as a trumpet or trombone (☞page 30 of this manual).

11: Reed Model

This is a physical model which simulates a wind instrument such as a saxophone or flute (☞page 33 of this manual)

12: Plucked String Model

This is a physical model which simulates a plucked string instrument such as a guitar or bass guitar (☞page 36 of this manual).

13: Bowed String Model

This is a physical model which simulates a bowed string instrument (☞page 40 of this manual).

3. Parameters

This section explains the **bank M** parameters which are added when the **MOSS-TRI DSP Synthesizer Option** is installed (pre-installed in the **Trinity V3 series**). For details on parameters other than **bank M**, refer to your Parameter Guide, Basic Guide, and Effect Guide.

Program Play Mode

Program Play P1

1–1: Program Play

Here, you can select programs and perform simple editing.
For details on the parameters, refer to page 1 of your Parameter Guide: "1. Program Play mode."
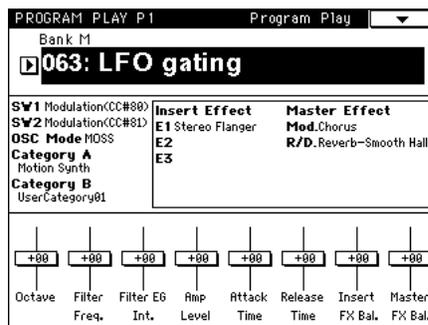
Depending on the oscillator type(s) used by the program or the combination of effect types, a brief interval of time may be required before a newly-selected program actually begins operating after it is selected.

Parameters

Prog. Play P1

Program Edit Mode

> The Write Program item in **the page menu commands** of each page lets you write an edited program to the program number you specify.
> Be sure to write an edited program that you wish to keep. If you turn **off** the power or select another program before you write, the edited program cannot be recovered.
> For details refer to Basic Guide page 23, "9. Writing a program or combination".

Program Edit P1

Here you can make basic settings for the program, and basic settings for the oscillator(s) that will be used.

1–1: Prog Basic
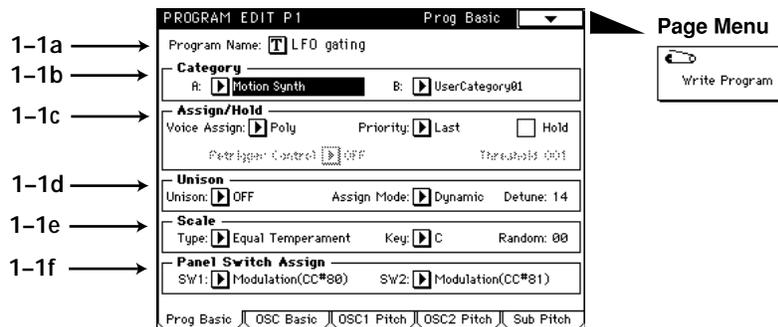
1–1a: Program Name

This indicates the program that was selected in Program Play mode.

You can press the text edit button to access a window that allows you to rename the program (☞page 6 in Basic Guide).

> When you wish to write a renamed program, be sure to use the Write Program operation (☞page 23 in Basic Guide). If you select another program or turn **off** the power, the newly specified program name will be lost.

1–1b: Category

Two categories can be specified for each program.

When selecting programs in Program Play mode, Combination Play mode, or Sequencer mode, you can use these categories to search for the desired program.

A (Category A)   [Keyboard…Drums/Perc.]

With the factory settings, these are listings of different types of instruments, but they can be changed in Global mode "4-1: Category Program A" (☞page 128 in Parameter Guide).

B (Category B)   [User Category P01…P16]

The factory set category names can be changed in Global mode "4-2: Category Program B" (☞page 128 in Parameter Guide).

1–1c: Assign/Hold

Here, you can specify how notes will sound when keys are pressed.

Voice Assign   [Mono (Multi), Mono (Single), Poly]

Selects whether the sound will be played monophonically or polyphonically.

Mono (Multi): Multi-triggered monophonic playing.

Mono (Single): Single-triggered monophonic playing

Poly: Polyphonic playing

When **Poly** is selected, the Retrigger Control and Threshold parameters will be unavailable.

Priority   [Last, Low, High]

Specifies the priority order that will be used when the number of keys pressed exceeds the maximum polyphony.

Last: The last-pressed note will take priority

Low: The lowest note will take priority

High: The highest note will take priority

Hold

When this is **checked**, the note will continue to sound after the key is released. However, if the EG selected by "4-1: Amp" (normally the Amp EG is used) has a sustain level of zero, the note will decay naturally.

Retrigger Control   [OFF…MIDI (CC#83)]

"Retrigger" refers to the action of resetting the EG and LFO at the time of note-on (the EG will return to its start level, and the LFO will return to the beginning of the cycle of its waveform). Here you can select the controller (Retrigger Controller ☞page 64 of this manual) which will specify whether or not the sound will be retriggered when a note-on occurs.

Threshold (Retrigger Control Threshold)   [1…127]

Specifies the value at which **EG** and **LFO** will be retriggered by a note-on.

The state of the controller selected by Retrigger Control (i.e., whether the controller value is above or below the specified Threshold value) will determine whether or not the sound will be retriggered when a note-on occurs.

The operation of this function will differ depending on the Voice Assign setting.

With a setting of **Mono (Multi)**, retriggering will occur if the controller is below the threshold value. If Retrigger Control is **OFF**, retriggering will always occur.

With a setting of **Mono (Single)**, retriggering will occur if the controller is above the threshold value. If Retrigger Control is **OFF**, retriggering will not occur.

If a note-on occurs when all notes are off, retriggering will always occur.
LFO's whose Key Sync is turned **OFF** will not be reset even if retriggering occurs.

1–1d: Unison

Here, you can make settings for unison mode.

Unison   [OFF, 2voices, 3voices, 6voices]

Specifies the number of notes which will be sounded in unison. With a setting of **OFF**, unison will not be used.

The maximum polyphony will be three notes with a setting of **2voices**, two notes for a setting of **3voices**, and one note for a setting of **6voices**.

Mode   [Fixed, Dynamic]

Specifies how the number of voices specified by the Unison setting will be allocated.

With a setting of **Fixed**, the number of voices specified by the Unison setting will always sound. With a setting of **Dynamic**, the number of voices will be determined by the current note-playing situation.

Detune   [0…99]

Detunes the notes that are sounded simultaneously by the Unison function.

Parameters

**Prog.
Edit
P1**

1–1e: Scale

Specifies the scale type

Type (Scale Type)   **[Equal Temperament…All Range User Scale]**

Selects the basic scale for the internal tone generator. The user scales can be specified in Global mode "3-1: User Scale" (☞page 127 in Parameter Guide).

Equal Temperament

The most widely used scale, consisting of equally-spaced semitone steps.

Pure Major

The major chords of the selected key will be perfectly in tune.

Pure Minor

The minor chords of the selected key will be perfectly in tune.

Arabic

This reproduces a quarter-tone scale of Arabic music.

Pythagorean

A scale based on ancient Greek musical theory, suitable for playing melodies.

Werckmeister (Werkmeister III)

An equal-tempered scale used in the later Baroque period.

Kirnberger (Kirnberger III)

A scale created in the 18th century, and used mainly for tuning harpsichords.

Slendro

An Indonesian gamelan scale in which the octave consists of 5 notes.

If the Key parameter is set to C, use the **C**, **D**, **F**, **G**, and **A** keys. (Other keys will produce the same pitches as equal temperament.)

Pelog

An Indonesian gamelan scale in which the octave consists of 7 notes.

If the Key parameter is set to **C**, use only the white keys. (The black keys will produce the same pitches as equal temperament.)

Octave User Scale

This is the one-octave scale that you create in Global mode "3-1b: Octave Notes" (☞page 127 in Parameter Guide).

Stretch

This is a tuning used on acoustic pianos.

All Range User Scale

This is the full-range scale (C-1=G9) that you create in Global mode "3-1a: All Notes" (☞page 127 in Parameter Guide).

Key (Scale Key)   **[C…B]**

Specifies the tonic note of the selected scale.

Random   **[0…99]**

As this value is increased, the pitch of the note will become increasingly unpredictable. Normally you will leave this set at **zero**.

Adjust this parameter when you wish to simulate instruments whose pitch is naturally unstable, such as tape-mechanism organs or acoustic instruments.

1–1f: Panel Switch Assign

These parameters assign the function of the front panel **SW1** and **SW2** switches (assignable panel switches 1 and 2).

SW1 `AMSource`   [JS(X) Lock…Modulation (CC#80)]

SW2 `AMSource`   [JS(X) Lock…Modulation (CC#81)]

The functions which can be assigned to SW1 and SW2 are the same (except for **Modulation**), and are as follows:

JS(X) Lock, JS(+Y) Lock, JS(–Y) Lock, Ribbon(X) Lock, Ribbon(Z) Lock, After Touch Lock, JS & Ribbon Lock

Each time you press SW1 (or SW2), the selected controller will alternate between Lock/Unlock (a lit LED indicates Lock). When you press SW1 (or SW2) while operating a controller, subsequent movement of that controller will produce no change.

For example if you **select JS(+Y) Lock**, and then move the joystick away from yourself and press **SW1** (or **SW2**), the joystick (+Y) movement will be **locked (held)** at that position, and modulation will continue to be applied even after the joystick is allowed to return. By then moving the joystick in the (–Y) direction, you can apply both types of modulation simultaneously.

MIDI If this is locked, the corresponding controller will also stop transmitting MIDI, but reception will still occur.

Octave Down

Each time you press SW1 (or SW2), the original octave setting will alternate with a setting of one octave lower.

Octave Up

Each time you press SW1 (or SW2), the original octave setting will alternate with a setting of one octave higher.

Portamento Off

Each time you press SW1 (or SW2), the portamento effect will alternate between **On** and **Off** (lit LED indicates **Off**). This is valid only for **bank M** programs.

MIDI **CC#65** will be transmitted each time **On/Off** occurs (a value of **0** for **Off**, **127** for **On**).

Modulation

Select this when you wish to use the switch as a AMS or Effect Dynamic Modulation source. In this case, you must first specify the control destination.

MIDI SW1 and SW2 differ for this function alone. For each **On/Off**, SW1 will transmit **CC#80**, and SW2 will transmit **CC#81** (a value of **0** for **Off**, **127** for **On**).

Parameters

**Prog.
Edit
P1**

1–2: OSC Basic

1–2a

1–2b

1–2c

1–2d

Page Menu

1–2a: Multi Oscillator Synthesis Setup

Here, you can make settings for the oscillator.
The parameters that are set in "2-1: OSC 1" and "2-2: OSC 2" will differ depending on the oscillator type that is selected here.

OSC 1 (Oscillator 1 Type)   [01: Standard…13: Bowed String Model]

Selects the oscillator type for oscillator 1.
01: Standard
02: Comb Filter
03: VPM (Variable Phase Modulation OSC)
04: Resonance
05: Ring Modulation
06: Cross Modulation
07: Sync Modulation
08: Organ Model
09: Electric Piano Model
10: Brass Model
11: Reed Model
12: Plucked String Model
13: Bowed String Model

When **10: Brass Model**, **11: Reed Model**, **12: Plucked String Model**, or **13: Bowed String Model** are selected, OSC 2 cannot be used.

OSC 2 (Oscillator 2 Type)   [01: Standard…09: Electric Piano Model]

Selects the oscillator type for oscillator 2. Refer to OSC 1.

1–2b: Common Pitch Modulation

Creates time-varying changes in the pitch of all oscillators (oscillators 1 and 2, and the sub oscillator).

AMS (Alternate Modulation Source)   [OFF…MIDI (CC#83)]

Selects the modulation source (☞page 64 of this manual) that will control the pitch of all oscillators (oscillators 1 and 2, and the sub oscillator).

Intensity (Common Pitch AMS Intensity)   [–99…+99]

Specifies the depth and direction of the effect produced by AMS.

1–2c: Bending

Specifies the width of pitch change that will occur when the joystick is moved to left and right.

JS(+X) (Joystick Intensity +X)   **[–60…+24]**

Specifies the amount and direction of pitch change (in semitone units) that will occur when the joystick is moved to the right.

With **positive (+)** settings the pitch will rise, and with **negative (-)** settings the pitch will fall. A setting of 12 will produce one octave of change.

Step (Joystick Step +X)   **[Continuous, 1/8, 1/4, 1/2, 1…12]**

Specifies how the pitch will change when the joystick is moved to the right.

Continuous: Smooth change.

1/8: Change in 1/8 semitone steps.

1/4: Change in 1/4 semitone steps.

1/2: Change in 1/2 semitone steps.

1…12: Change in steps of the specified number of semitones (up to 1 octave).

JS(–X) (Joystick Intensity –X)   **[–60…+24]**

Specifies the amount and direction of pitch change (in semitone units) that will occur when the joystick is moved to the left.

Step (Joystick Step –X)   **[Continuous, 1/8, 1/4, 1/2, 1…12]**

Specifies how the pitch will change when the joystick is moved to the left.

Refer to Step (Joystick Step +X).

If the Step (Joystick Step +X) or Step (Joystick Step –X) settings are greater than the settings for JS (+X) and JS (–X), the pitch will not change.

1–2d: Portamento

These settings specify how portamento will be applied. (Portamento creates a smooth change in pitch from one note to the next.) The setting you make here is valid only if **Enable is checked**.

Enable

Check this when you wish to use portamento.

Fingered

Check this when you want to apply portamento only when a note is pressed while continuing to hold the previous note.

Time   **[0…99]**

Specifies the portamento time. Higher values will cause the pitch to change more slowly.

AMS (Alternate Modulation Source)   **[OFF…MIDI (CC#83)]**
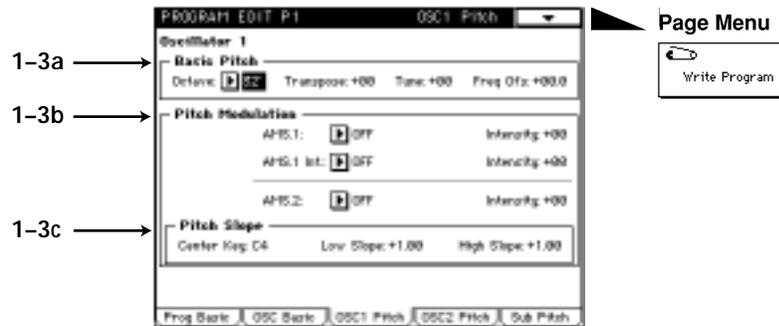
Selects a modulation source (☞page 64 of this manual) that will control "Time."

Intensity (Portamento Time AMS Intensity)   **[–99…+99]**

Specifies the way in which the portamento time will be controlled by the "AMS ."

Parameters

Prog.
Edit
P1

1–3: OSC 1 Pitch

Here, you can make settings for the basic pitch of oscillator 1, pitch modulation, and pitch slope.

1–3a: Basic Pitch

Specifies the basic pitch of oscillator 1

Octave   [32'…4']

Specifies the basic pitch of oscillator 1 in steps of an octave. **32'** is two octaves below, **16'** is one octave below, **8'** is standard pitch, and **4'** is one octave above.

Transpose   [–12…+12]

Adjusts the basic pitch specified by "Octave" in semitone steps.

Tune   [–50…+50]

Makes fine adjustments to the pitch in one-cent steps.

Frequency Ofs   [–10.0…+10.0]

Makes fine adjustments to the pitch in 0.1 Hz steps.

1–3b: Pitch Modulation

Specifies the pitch Modulation.

AMS.1 (Alternate Modulation Source 1)   [OFF…MIDI (CC#83)]

Selects a modulation source 1 (☞page 64 of this manual) which will modify the pitch (e.g., apply vibrato).

Intensity (Pitch AMS.1 Intensity)   [–99…+99]

Specifies the depth and direction of the pitch change that will be controlled by "AMS.1."

AMS.1 Int (AMS.1 Intensity Alternate Modulation Source) [OFF…MIDI (CC#83)]

Specifies the controller (☞page 64 of this manual) that will control the "Intensity (Pitch AMS.1 Intensity)."

Intensity (AMS.1 Int AMS Intensity)   [–99…+99]

Specifies the depth of the pitch modulation effect controlled by "AMS.1 Int ."

AMS.2 (Alternate Modulation Source 2)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 2 (☞page 64 of this manual) which will modify the pitch (e.g., apply vibrato).

Intensity (Pitch AMS.2 Intensity)   **[–99…+99]**

Specifies the depth and direction of the pitch change that will be controlled by "AMS.2."

1–3c: Pitch Slope

Specifies how pitch will change in relation to the keyboard (key)

Center Key   **[C–1…G9]**

Specifies the key at which Lower/Higher keyboard tracking will begin to apply.

Low Slope   **[–1.00…+2.00]**

Specify the depth and direction of the pitch change that will occur for notes below the "Center Key."

**High Slope**   **[–1.00…+2.00]**

Specifies the depth and direction of the pitch change that will occur for notes above the Center Key.

When Low Slope and High Slope are set to +**2.0**, playing one octave upward from the Center Key will cause the pitch to rise two octaves.

With a setting of –**1.0**, playing one octave upward will cause the pitch to fall one octave. With a setting of **0.0**, the notes in the respective areas will produce the same pitch as the Center Key. To play pitches normally, set this parameter to +**1.0**.
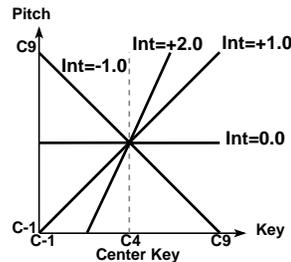
1–4: OSC 2 Pitch

Here, you can make settings for the oscillator type, basic pitch, pitch keyboard tracking, and pitch modulation of oscillator 2. The parameters of oscillator 2 are the same as for oscillator 1. (Refer to the explanation of the "1–3: OSC 1 Pitch" page).

1–5: Sub Pitch

Here, you can make settings for the oscillator type, basic pitch, pitch keyboard tracking, and pitch modulation of sub oscillator . The parameters of sub oscillator are the same as for oscillator 1. (Refer to the explanation of the "1–3: OSC 1 Pitch" page).

Parameters

**Prog.
Edit
P1**

Program Edit P2

Here, you can make settings for each oscillator type. The oscillator type is specified in "1-2a: Multi Oscillator Synthesis Setup" of "1-2: OSC Basic."

The display pages that appear will depend on the selected oscillator type.

2–1: OSC
01: Standard

This oscillator produces the waveforms used by an analog synthesizer (sawtooth wave, pulse wave, triangle wave) and sine wave. Sawtooth wave, pulse wave and triangle wave waveforms can be modified using waveform modulation. You can specify either sawtooth wave or pulse wave as the main waveform, and mix triangle wave or sine wave with this for output. The level of these three waveforms can be adjusted independently. In addition, wave shaping can be applied to the output of this oscillator.

Waveform modulation

Pulse width modulation (PWM) on an analog synthesizer produces time-varying change in the pulse width of a pulse wave. The waveform modulation provided by the **MOSS-TRI option** is an extension of this, which varies not only the pulse width but also the waveform of a sawtooth wave or triangle wave. Waveform modulation will affect the various waveforms as follows.
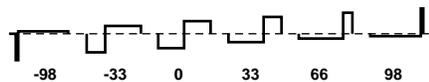
Sawtooth wave

Waveform modulation will modify a sawtooth waveform as shown below, creating time-variant change in the sound.When modulation is **0**, the basic sawtooth waveform will be produced, and when it is **99**, a sawtooth wave of double the frequency will be produced. If the modulation value is a negative number, a different effect will result than with positive settings.
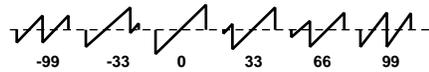
Pulse wave

Waveform (pulse width) modulation will modify a pulse waveform as shown below, creating time-variant change in the sound. When modulation is **0**, a square wave will be produced, and when it is **99**, the pulse width will be 0, meaning that there will be no sound. If the modulation value is a negative number, the results will be inverted.

Triangle wave

Waveform modulation will modify a ramp wave as shown below, creating time-variant change in the sound. When modulation is **0**, a triangle wave will result, and as the modulation value increases, the waveform will become a ramp wave (a waveform in which the slope is broken in two). At a modulation value of **50**, a trapezoidal wave will result, and at a value of **99** the waveform will once again be a triangle wave. If the modulation value is a negative number, the results will be inverted.Compared to sawtooth or pulse waves, this waveform produces a strong fundamental with fewer overtones, making it particularly suitable for bass sounds etc.

2–1a: Wave

**Main Wave**   **[Saw, Pulse]**

Selects the main waveform. Select either **Saw** (sawtooth wave) or **Pulse** (pulse wave).

Level   **[0…99]**

Specifies the output level of the main waveform.

Wave Edge   **[0…99]**

Adjusts the amount of high-range overtones for the main waveform. As the pitch rises, this effect will become stronger, and in the low range there will be little effect. Lower settings of this parameter will produce a more mellow sound, and in the vicinity of **0** the volume will also decrease.

Triangle Level   **[0…99]**

Specifies the output level of the triangle waveform. It will be output mixed with the main waveform.

Sine Level   **[0…99]**

Specifies the output level of the sine waveform. It will be output mixed with the main waveform.

Phase Shift (Triangle & Sine Phase Shift)   **[–99…+99]**

Specifies the phase difference between the main waveform and the triangle and sine waveforms. (The triangle and sine waveforms will always be in phase with each other.)

2–1b: Waveform(Waveform Modulation)

Waveform   **[–99…+99]**

Specifies the waveform. For the way in which this value will affect the waveform, refer to the diagrams shown on the previous page for sawtooth wave, pulse wave, and triangle wave.

LFO   **[LFO1…LFO4]**

Selects the source LFO for waveform modulation. LFO settings are made in the "Program Edit P6."

Intensity (Waveform Modulation LFO Intensity)   **[–99…+99]**

Specifies the depth and direction of the waveform modulation that will be controlled by the LFO specified in "LFO."

AMS (Alternate Modulation Source)   **[OFF…MIDI (CC#83)]**

Selects a modulation source (☞page 64 of this manual) that will control "Waveform."

Intensity (Waveform AMS Intensity)   **[–99…+99]**

Specifies the depth and direction of the waveform modulation controlled by the "AMS." For negative settings, the polarity of the modulation source will be inverted.

2–1c: Wave Shape

Input (Input Level)   **[0…99]**

Specifies the level of the signal that is input from the standard oscillator to the wave shaping table.

Example of when Input Level is modified   (Table Type : Reso)
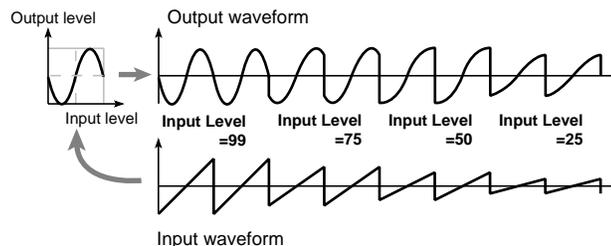
AMS (Alternate Modulation Source)   **[OFF…MIDI (CC#83)]**

Selects a modulation source (☞page 64 of this manual) that will control "Input."

Intensity (Input Level AMS Intensity)   **[–99…+99]**

Specifies the depth and direction of the waveform modulation controlled by the "AMS."

Parameters

**Prog.
Edit
P2**

Type (Wave Shape Table Type) **[Clip/Reso]**

Use **the radio buttons** to select the wave shaping table which will modify the input waveform.

Clip (clip type) and Reso (resonant type) tables will modify the waveform as shown by the diagrams in Shape, below.

Offset (Wave Shape Offset) **[–99…+99]**

Specifies an offset amount that will be added to the signal specified by "Input."
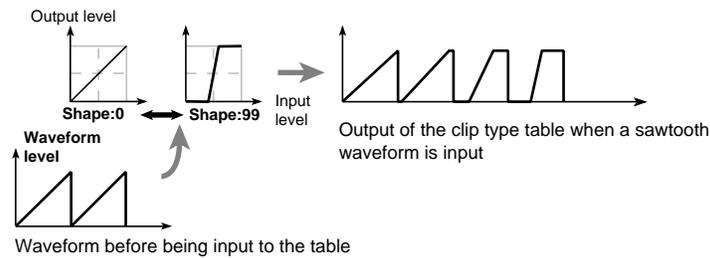
Example of when Offset is modified (Table Type: Clip)

Output level

Output waveform

Input level

Offset=50   Offset=0   Offset=-50
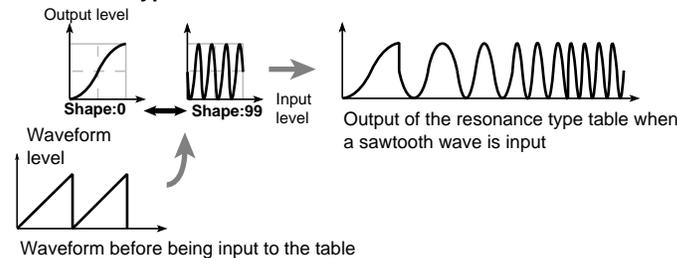
Input waveform (Input Level fixed)
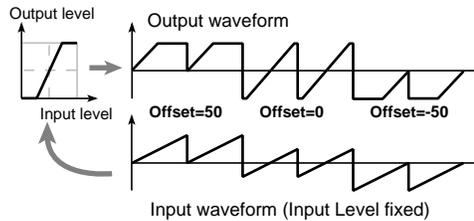
Shape **[0…99]**

Specifies the characteristics of the table which will modify the input waveform. The characteristics of the table will change as follows.

Shape of the wave shaping table and the Shape parameter
CLIP type

Output level

Shape:0   Shape:99   Input level

Waveform level

Output of the clip type table when a sawtooth waveform is input

Waveform before being input to the table

Resonant type

Output level

Shape:0   Shape:99   Input level

Waveform level

Output of the resonance type table when a sawtooth wave is input

Waveform before being input to the table

AMS (Alternate Modulation Source) **[OFF…MIDI (CC#83)]**

Selects a modulation source (☞page 64 of this manual) that will control "Shape."

Intensity (Shape AMS Intensity) **[–99…+99]**

Specifies the depth and direction of the waveform modulation controlled by the "AMS."

Balance **[0…99]**

Specifies the balance between the signal that has passed through the wave shaping table and the output signal from the standard oscillator. With a setting of 99, it will be only the output of the wave shaping table.

AMS (Alternate Modulation Source) **[OFF…MIDI (CC#83)]**

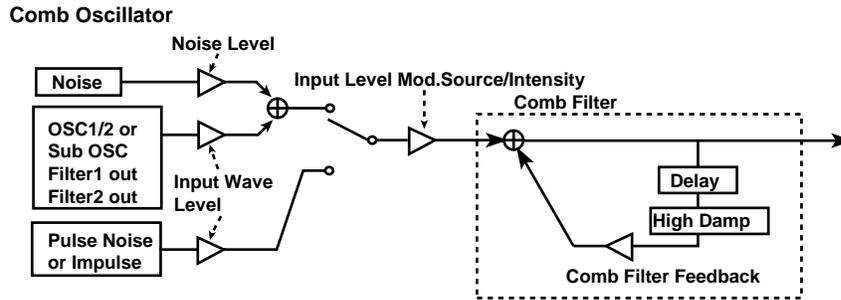Selects a modulation source (☞page 64 of this manual) that will control "Balance."
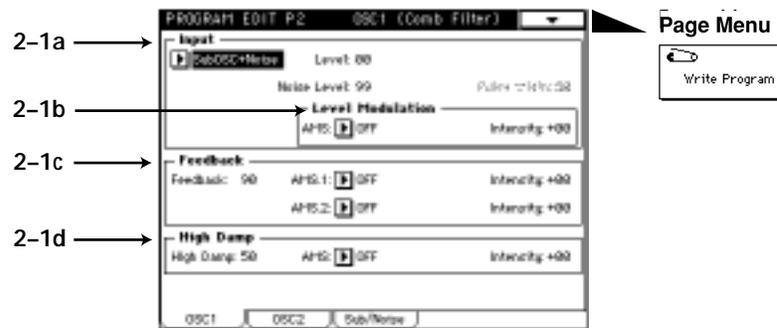
Intensity (Balance AMS Intensity) **[–99…+99]**

Specifies the depth and direction of the waveform modulation controlled by the "AMS."

02: Comb Filter

In this oscillator, the signal from the other oscillator waveform or the noise generator is sent through a comb filter, and the feedback level of the comb filter is varied in order to produce tonal change. When noise is input, raising the feedback of the comb filter will gradually change the sound into a pitched tone.

Comb Oscillator

Example of when noise is input

As the Feedback value increases, the sound will become more pitched.

Page Menu

2–1a

2–1b

2–1c

2–1d

2–1a: Input

Input   [OSC2(1)+Noise, SubOSC+Noise, Filter1+Noise, Filter2+Noise, Pulse Noise, Impulse]

Selects the signal that will be input to the comb filter.

Example of when an Impulse is input

As the Feedback is increased, the decay time will become longer.

Pluse Width=0   Pluse Width=99

Level (Input Wave Level) [0…99]

Specifies the volume level of the signal that will be input to the comb filter.

Noise Level [0…99]

This parameter will be available only if "Input" has been set to **OSC2(1)+Noise**, **SubOSC+Noise**, **Filter1+Noise** or **Filter2+Noise**. It specifies the volume level of the noise generator output which will be input to the comb filter.

Pulse Width [0…99]

This parameter will be available only if "Input" has been set to **Pulse Noise** or **Impluse**. It specifies the length of time that the **Pulse Noise** or **Impluse** will last after being triggered.

2–1b: Level Modulation

AMS (Alternate Modulation Source) [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control the volume level of the signal being input to the comb filter. The volume level is set by the "Level" or the "Noise Level."

Intensity (Input Wave Level AMS Intensity) [–99…+99]

Specifies the depth and direction of the effect of "AMS."

2–1c: Feedback

Feedback [0…99]

Specifies the amount of feedback for the comb filter. If this value is high, the resonance of the comb filter will be high, and the tone will have a clear sense of pitch. Conversely, if this value is low, the input signal will be output without change, and if the input signal is only noise, the output signal will have no sense of pitch.

AMS.1 (Alternate Modulation Source 1) [OFF…MIDI (CC#83)]

Selects a modulation source 1 (☞page 64 of this manual) that will control "Feedback."

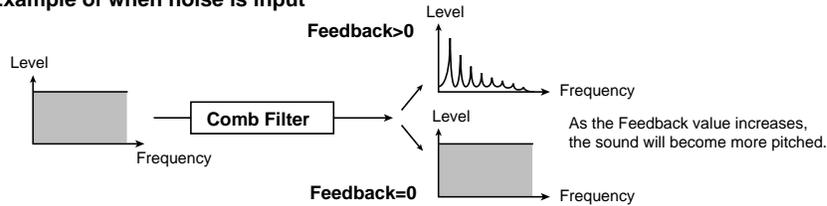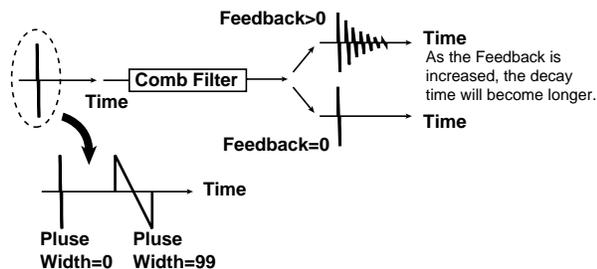**Intensity (Feedback AMS.1 Intensity)** [–99…+99]

Specifies the depth and direction of the effect of "AMS.1 ."

AMS.2 (Alternate Modulation Source 2) [OFF…MIDI (CC#83)]

Selects a modulation source 2 (☞page 64 of this manual) that will control "Feedback."

Intensity (Feedback AMS.2 Intensity) [–99…+99]

Specifies the depth and direction of the effect of "AMS.2 ."

2–1d: High Damp

High Damp [0…99]

Specifies the amount of attenuation that will be applied to the high-frequency component of the feedback signal within the comb filter.

As this **value is increased**, the tone will become more mellow. Conversely, **decreasing this value** will produce a brighter tone.

AMS (Alternate Modulation Source) [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control "High Damp."

Intensity (High Damp AMS Intensity) [–99…+99]

Specifies the depth and direction of the effect of "AMS."

03: VPM

The output of a carrier is phase-modulated by a modulator, and output through wave shape processing. By controlling the wave shaping parameters and the feedback gain, tonal changes that are different than simple phase modulation can be produced.
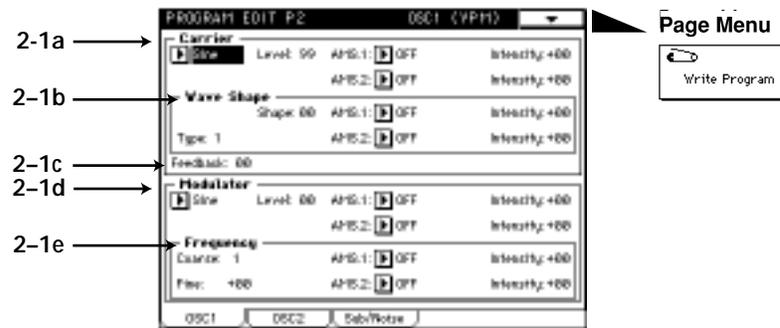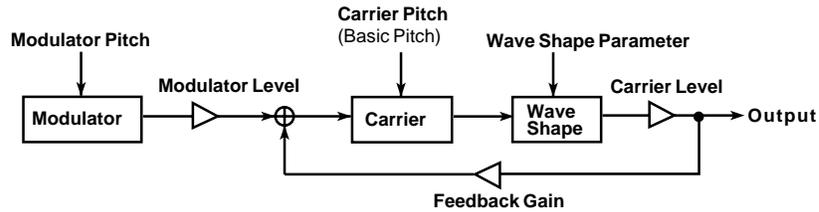
2–1a: Carrier

Wave   **[Saw, Square, Triangle, Sine]**

Selects the carrier waveform.

Level   **[0…99]**

Specifies the output level of the carrier. This will determine the output level of the VPM oscillator.

AMS.1 (Alternate Modulation 1 Source)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 1 (☞page 64 of this manual) that will control "Level."

Intensity (Level AMS.1Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS.1."

AMS.2 (Alternate Modulation 2 Source)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 2 (☞page 64 of this manual) that will control "Level."

Intensity (Level AMS.2 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS.2."

2–1b: Wave Shape

Shape   **[0…99]**

Specifies the number of cycle of wave shaping. As this **value is increased**, the number of cycles will increase, causing more overtones to be added to the high-frequency range of the sound.

Table Variation Shape:0 ←→ Shape:99

**Prog.
Edit
P2**

AMS.1 (Alternate Modulation Source 1)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 1 (☞page 64 of this manual) that will control "Shape" value.

Intensity (Shape AMS.1 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS.1."

AMS.2 (Alternate Modulation Source 2)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 2 (☞page 64 of this manual) that will control "Shape" value.

Intensity (Shape AMS.2 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS.2."

Type (Wave Shap Type)   **[1, 2]**

1: The signal after wave shaping will be output without further change. If "Shape" is set to the minimum value, the phase modulated signal will be output essentially without change.
2: A rounded waveform will be obtained regardless of the "Shape" value.

2–1c: Feedback   [0…99]

Specifies the amount of the output after wave shaping that will be fed back to the carrier.

2–1d: Modulator

Wave   **[Saw, Square, Triangle, Sine, OSC2(1), SubOSC, Filter1, Filter2]**

Selects the modulator waveform. You may select the other oscillator or the sub oscillator, etc.
If you select **OSC 2(1)**, **SubOSC**, **Filter 1**, or **Filter 2**, it will not be possible to set "2-1e: Frequency."

Level   **[0…99]**

Specifies the output level of the modulator.
This value will determine the amount of modulation that is applied to the "2-1a: Carrier" setting.

AMS.1 (Alternate Modulation Source 1)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 1 (☞page 64 of this manual) that will control "Level."

Intensity (Level AMS.1 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS.1."

AMS.2 (Alternate Modulation Source 2)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 2 (☞page 64 of this manual) that will control "Level."

Intensity (Level AMS.2 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS.2."

2–1e: Frequency

Coarse   **[0.5, 1…16]**

Specifies a multiplication factor which will be applied to the pitch of the modulator, relative to the "2-1a: Carrier" setting.

Fine   **[–50…+50]**

Makes fine adjustments to the pitch of the modulator.

AMS.1 (Alternate Modulation Source 1)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 1 (☞page 64 of this manual) that will control the pitch of the modulator.

Intensity (Frequncy AMS.1 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS.1."

AMS.2 (Alternate Modulation Source 2)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 2 (☞page 64 of this manual) that will control the pitch of the modulator.

Intensity (Frequncy AMS.2 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS.2."

04: Resonance

This oscillator produces a wide range of tonal change by allowing you to specify the cutoff frequency and resonance of four band pass filters (BPF). You can select one of the following sources to be the input for the filters: the output of the other oscillator, the sub-oscillator, the output of the noise generator, or the output of filter 1 or filter 2.

2–1a: Input

Input   [OSC2(1), SubOSC, Noise, Filter1, Filter2]

Selects the signal that will be input to the four band bass filters.

If you select **04:Resonance** for OSC 1 and 2 in "1-2a: Multi Oscillator Synthesis Setup," and select the other oscillator as the input for each, the result will be unstable — the sound may be non-reproduceable, or you may hear no sound at all.

Level   [0…99]

Specifies the level of the signal that is input to the four band pass filters.

AMS.1 (Alternate Modulation Source 1)   [OFF…MIDI (CC#83)]

Selects a modulation source 1 (☞page 64 of this manual) that will control "Level."

Intensity (Level AMS.1 Intensity)   [–99…+99]

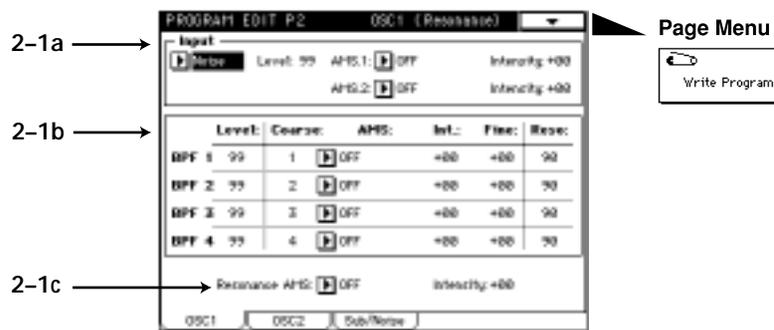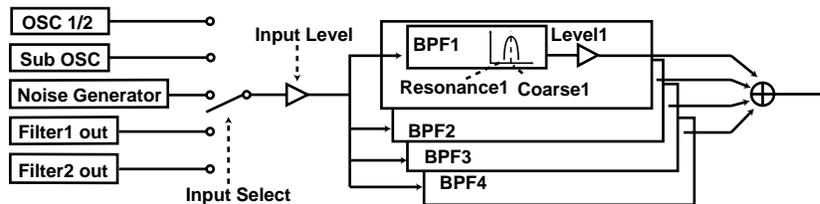Specifies the depth and direction of the effect of "AMS.1."

AMS.2 (Alternate Modulation Source 2)   [OFF…MIDI (CC#83)]

Selects a modulation source 2 (☞page 64 of this manual) that will control "Level."

Intensity (Level AMS.2 Intensity)   [–99…+99]

Specifies the depth and direction of the effect of "AMS.2."

Parameters

2–1b: BPF1…4

Here, you can make settings for each band pass filter 1—4.

Level   [0…99]

Specifies the output level.

Coarse   [1…16]

Specifies the harmonic (overtone) of the oscillator pitch at which the center frequency of the filter will be located. You can specify from the first to the 16th harmonic.

AMS (Alternate Modulation Source)   [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control Coarse.

Int. (BPF Frequency AMS Intensity)   [–15…+15]

Specifies the depth and direction of the effect of AMS. **Positive (+)** settings will allow the Coarse value to be increased, and **negative (–)** settings will allow the Coarse value to be decreased. At this time, the center frequency of band pass filter 1 will change in steps of harmonics, creating the impression that the pitch is changing step-wise.

Fine   [–99…+99]

Makes fine adjustments to the center frequency of band pass filter 1 specified by the Coarse parameter.

Reso   [0…99]

Specifies the resonance. Increasing this value will produce a stronger effect.

2–1c: Resonance

### Resonance AMS (Resonance Alternate Modulation Source)   [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control the resonance that was specified for each band pass filter.

Intensity (Resonance AMS Intensity)   [–99…+99]

Specifies the depth and direction of the effect of "Resonance AMS."

05: Ring Modulation

This multiplies the modulator and carrier and outputs the signal produced. One of four types of waveform can be selected as the carrier. Since the result will be a metallic sound with little sense of pitch, this is suitable for producing sound effects. The Ring Modulation oscillator contains an internal carrier oscillator. The output of the other oscillator etc. can be selected as the modulator.

Ring Modulation

Modulator →

Carrier Wave →

Page Menu

Write Program

2–1a ⟶

2–1b ⟶
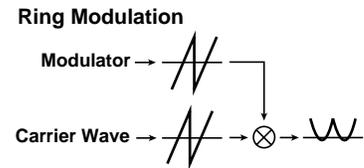
2–1a: Input

Input   [OSC2(1), SubOSC, Noise, Filter1, Filter2]

Specifies the modulator.

If you select **05:Resonance** for OSC 1 and 2 in "1-2a: Multi Oscillator Synthesis Setup," and select the other oscillator as the Input for each, you may hear no sound at all for some parameter settings.

Carrier   [Saw, Square, Triangle, Sine]

Specifies the carrier waveform.

Wave Edge   [0…99]

Specifies the amount of high frequency harmonics for the carrier waveform. As this **value is decreased**, the sound will have less high-frequency harmonics, and as it approaches 0 the volume will also decrease.

Type   [1, 2]

Selects the modulation type. The two types differ in the tone of the high range. Type **2** will produce a brighter sound than type **1**.

2–1b: Mod. Depth

Mod. Depth   [0…99]

Specifies the depth of modulation. At a setting of **0**, the carrier waveform will be output without change.

AMS.1 (Alternate Modulation Source 1)   [OFF…MIDI (CC#83)]

Selects a modulation source 1 (☞page 64 of this manual) that will control "Mod. Depth."

Intensity (Modulation Depth AMS.1 Intensity)   [–99…+99]

Specifies the depth and direction of the effect of "AMS.1."

AMS.2 (Alternate Modulation Source 2)   [OFF…MIDI (CC#83)]

Selects a modulation source 2 (☞page 64 of this manual) that will control "Mod. Depth."

Intensity (Modulation Depth AMS.2 Intensity)   [–99…+99]

Specifies the depth and direction of the effect of "AMS.2."

Parameters

Prog. Edit P2

06: Cross Modulation

This uses a modulator to frequency-modulate a carrier. You can select one of four waveforms as the carrier. In general, a pitch envelope is applied to the modulator. A carrier oscillator is built-in to the Cross Modulation OSC. You can select the output of the other oscillator etc. as the modulator.

Cross Modulation

Page Menu
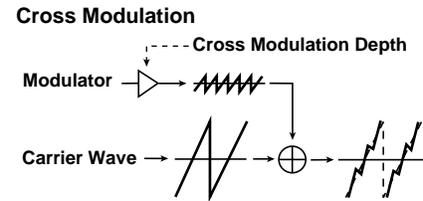
2–1a: Input

Input [OSC2(1), SubOSC, Noise, Filter1, Filter2]

Specifies the modulator.

Carrier [Saw, Square, Triangle, Sine]

Specifies the carrier waveform.

Wave Edge [0…99]

Specifies the amount of high frequency harmonics for the carrier waveform. As this **value is decreased**, the sound will have less high-frequency harmonics, and as it approaches 0 the volume will also decrease.

2–1b: Mod. Depth

Mod. Depth [0…99]

Specifies the depth of modulation. At a setting of **0**, the carrier waveform will be output without change.

AMS.1 (Alternate Modulation Source 1) [OFF…MIDI (CC#83)]

Selects a modulation source 1 (☞page 64 of this manual) that will control "Mod. Depth."

Intensity (Modulation Depth AMS.1 Intensity) [–99…+99]

Specifies the depth and direction of the effect of "AMS.1."

AMS.2 (Alternate Modulation Source 2) [OFF…MIDI (CC#83)]

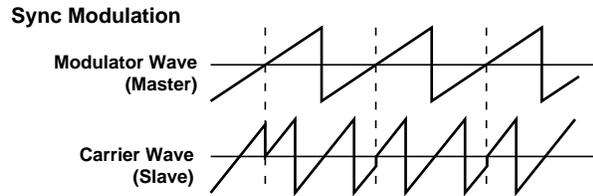Selects a modulation source 2 (☞page 64 of this manual) that will control "Mod. Depth."

Intensity (Modulation Depth AMS.2 Intensity) [–99…+99]

Specifies the depth and direction of the effect of "AMS.2."

07: Sync Modulation

This uses the modulator as the master waveform and the carrier as the slave waveform (which will be synchronized to the master).

When the master waveform begins a new cycle (i.e., the instant that it passes the zero point going from negative to positive), the phase of the slave waveform is reset to 0, causing it to begin a new cycle.

2–1a: Input

Input [OSC2(1), SubOSC, Noise, Filter1, Filter2]

Specifies the master waveform (modulator).

Slave [Saw, Square, Triangle, Sine]

Specifies the slave waveform.

Wave Edge [0…99]

Specifies the amount of high frequency harmonics for the slave waveform. As this **value is decreased**, the sound will have less high-frequency harmonics, and as it approaches **0** the volume will also decrease.

Parameters

Prog.
Edit
P2

08: Organ Model

This is an oscillator used to produce organ-type sounds. The oscillator simulates three drawbars similar to electric organs of the past.

You can specify the footage [Harmo] and waveform setting for each drawbar, allowing a wide range of sounds to be created.

2–1a: Drawbar 1

Wave   **[Sine 1, Sine 2, Sine 3, Triangle]**

Specifies the waveform for drawbar 1. **Sine 1** contains only the fundamental (i.e., a pure sine wave). **Sine 2** and **Sine 3** are waveforms which contain the first two and the first three harmonics respectively.

Coarse (Harmonics Coarse)   **[1…16]**

Specifies the pitch of drawbar 1, relative to one octave below the oscillator pitch.

Fine (Harmonics Coarse Fine)   **[–99…+99]**

Makes fine adjustments to the pitch of drawbar 1.

Level   **[0…99]**

Specifies the volume level of drawbar 1.

AMS (Alternate Modulation Source)   **[OFF…MIDI (CC#83)]**

Selects a modulation source (☞page 64 of this manual) that will control the "Level" of drawbar 1.

Intensity (Level AMS Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS.1."

2–1b: Percussion Level [0…99]

Specifies the volume level of the percussion effect for drawbar 1.

2–1c: Drawbar 2

The parameters are structured identically to those of "2-1a: Drawbar 1." Refer to "2-1a: Drawbar 1" and "2-1b: Percussion Level."

2–1d: Drawbar 3

The parameters are structured identically to those of "2-1a: Drawbar 1." Refer to "2-1a: Drawbar 1" and "2-1b: Percussion Level."

2–1e: Percussion Generator

Trigger [Single/Multi]
Use **the radio buttons** to specify how the percussion effect will be triggered.
With a setting of **Single**, the percussion effect will apply to the first-played note from a condition of no sound.
With a setting of **Multi**, the percussion effect will apply to each note that is played.

Decay [0…99]
Specifies the decay length of the percussion. As this value is increased the decay time will become longer.

Level AMS (Level Alternate Modulation Source) [OFF…MIDI (CC#83)]
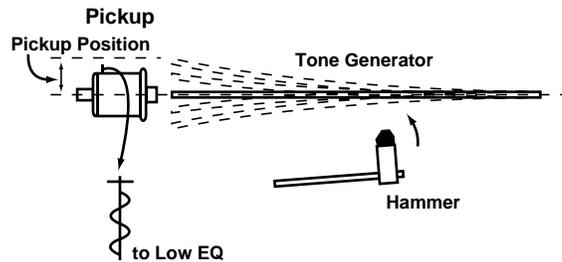Selects a modulation source (☞page 64 of this manual) that will control the percussion level of each drawbar.

Intensity (Level AMS Intensity) [–99…+99]
Specifies the depth and direction of the effect of "Level AMS" on the percussion level.

Parameters

09: Electric Piano Model

This oscillator simulates an electric piano.

There are four groups of parameters: Hammer (which specifies how the shape and motion of the hammer will affect tonal change and attack noise), Tone Generator (which vibrates in response to being struck by the hammer), Pickup (which specifies the tonal change that occurs when the vibration of the tone generator is converted into an electrical signal), and Low EQ (which is a shelving-type low EQ to adjust the low range).

2–1a: Hammer

Force   [0…99]

Specifies the "Strength" with which the hammer strikes the tone generator. **Higher settings** will produce a brighter sound.

Force Velocity Curve   [OFF, 0…99]

Specifies how changes in velocity will affect "Force." As this **value is increased**, velocity will have a greater effect on "Force," allowing more dynamic tonal change to be produced. With a setting of **OFF**, the "Force" will be constant.

Width (Hammer Width)   [0…99]

Simulates the shape of the hammer. As this **value is increased**, the width of the hammer will become narrower, and the sound of the tone generator and hammer noise will become sharper.

Click Noise Level   [0…99]

Specifies the volume of the hammer noise that occurs at the attack.

2–1b: Tone Generator

The Decay and Release that you specify here will control the output level of the oscillator. In order for these settings to have an effect, they must be set longer than the decay and release of the EG which you are using for the Amp.

Decay [0…99]

Specifies the decay time of the tone generato.

Release [0…99]

Specifies the release time of the tone generator.

2–1c: Overtone

Level [0…99]

Specifies the volume of the higher overtones that are produced when the tone generator vibrates.

Frequency [0…99]

Specifies the frequency of the overtones.

Decay [0…99]

Specifies the decay time of the overtone volume.

2–1d: Pickup Position

Position [0…99]

Specifies the location of the pickup in relation to the tone generator. With low settings, the pickup will be placed in the center of the vertical vibration of the tone generator, causing the second partial to be emphasized and the fundamental to be less audible.

AMS (Alternate Modulation Source) [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control "Position."

Intensity (Pickup Position AMS Intensity) [–99…+99]

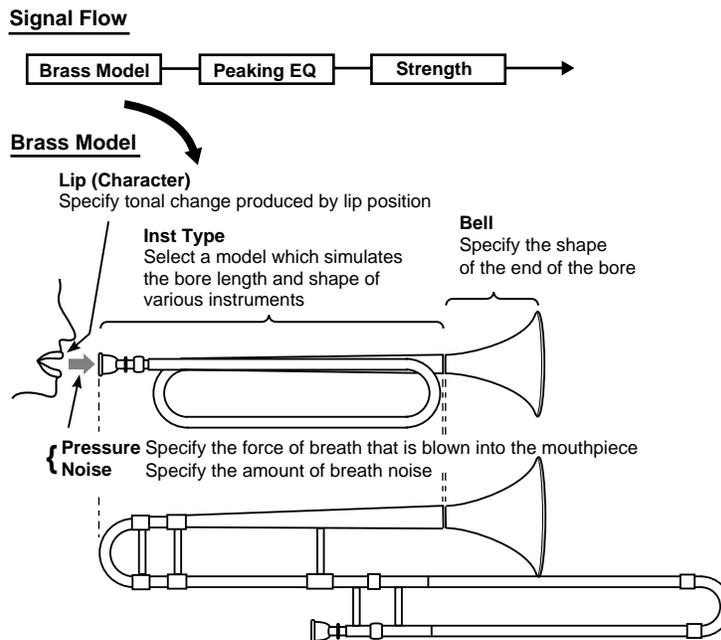Specifies the depth and direction of the effect of "AMS."

2–1e: Low EQ

Makes settings for a Low EQ (shelving type) that will adjust the output signal.

Frequency (EQ Frequency) [0…49]

Specifies the cutoff frequency of the Low EQ (shelving type) that will be applied to the output signal.

Gain [–18…+18]

Specifies the gain of the Low EQ.

Parameters

**Prog.
Edit
P2**

10: Brass Model

This oscillator is a physical model which simulates lip-reed instruments such as a trumpet or trombone. By using key velocity or modulation wheel to modulate the Pressure (the force of breath blown into the mouthpiece) you can produce performance expressions that are very similar to those of an actual lip-reed instrument. The parameters are as follows: Inst Type determines the model which simulates the bore length and shape of the instrument, Breath Pressure indicates the force of breath that is blown into the mouthpiece, Lip Character produces the tonal changes that result from lip position or tension, Bell Character produces the tonal changes that result from the shape of the end of the bore, and Peaking EQ performs a final tonal adjustment.

Signal Flow

```
Brass Model ── Peaking EQ ── Strength ──▶
```

Brass Model

Lip (Character)
Specify tonal change produced by lip position

Inst Type
Select a model which simulates the bore length and shape of various instruments

Bell
Specify the shape of the end of the bore

Pressure Specify the force of breath that is blown into the mouthpiece
Noise Specify the amount of breath noise

This oscillator allows you to choose from two types of pitch bending: jump bending using a mode jump as on a trumpet (by varying the bore length), and smooth bending produced by sliding the length of the bore as on a trombone.

For some parameter settings, the pitch may not change according to the notes that are played on the keyboard. In some cases, high-pitched notes may have a lower volume, or may not sound at all.

2–1a
2–1b
2–1c
2–1d
2–1e

Page Menu

Write Program

2–1a: Inst Type

Inst Type   **[Brass 1, Brass 2, Brass 3, Horn 1, Horn 2, Reed Brass]**

Selects the instrument type which will determine the bore length and shape of the simulated instrument.

Jump Bend (+X)

Specifies how the pitch will change when the joystick is moved in the +**X** direction (toward the right).

If this is **checked**, the pitch will rise by in steps by changing the resonance of the bore, as on a trumpet.

If this is **unchecked**, the pitch will rise smoothly, as on most synthesizers.

Jump Bend (–X)

Specifies how the pitch will change when the joystick is moved in the –**X** direction (toward the left).

If Jump Bend (+X) and Jump Bend (–X) are **checked**, notes may not sound depending on the position of the joystick and the pitch range setting.
For details on setting the pitch range of the joystick, refer to "1-2c: Bending."

2–1b: Breath Pressure

EG   **[EG 1…EG 4, Amp EG]**

Selects the EG which will control pressure.

For details on the settings for each EG, refer to "Program Edit P5" for EG 1—4, and "4-2: Amp EG" for Amp EG.

Intensity (Pressure EG Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect that the "EG" will have on the pressure.

AMS.1 (Alternate Modulation Source 1)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 1 (☞page 64 of this manual) that will control pressure. If you select **After Touch**, pressing down on the keyboard will produce the effect of the instrument being blown strongly. If you select **Joy Stick(X)**, rotating the Joy Stick in the + direction will produce this effect. In this case, setting "Intensity (Pressure EG Intensity)" to **0** will allow you to completely control the breath pressure by operating the specified controller.

Intensity (Pressure AMS.1 Intensity)   **[–99…+99]**

Specifies the depth and direction of the change in pressure controlled by "AMS.1."

AMS.2 (Alternate Modulation Source 2)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 2 (☞page 64 of this manual) that will control pressure.

Intensity (Pressure AMS.2 Intensity)   **[–99…+99]**

Specifies the depth and direction of the change in pressure controlled by "AMS.2."

Breath Noise   **[0…99]**

Specifies the volume level of the breath noise. Since this uses the signal from the noise generator, the filter of the noise generator can be used to modify the tone of the noise.

Strength   **[0…99]**

Adjusts the tone. **Higher settings** of this value will produce a overdriven sound.

2–1c: Lip Character

Lip   **[0…99]**

Specifies the tonal change that is produced by lip position and tension. **Higher settings** of this value will produce a harder (more firmly blown) sound. **Lower settings** will produce a softer tone.

AMS (Alternate Modulation Source)   **[OFF…MIDI (CC#83)]**

Selects a modulation source (☞page 64 of this manual) that will control "Lip."

Intensity (Lip Character AMS Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS."

Parameters

**Prog.
Edit
P2**

2–1d: Bell Character

Tone [0…99]

Specifies the tone of the bell. As this **value is increased**, the low frequency portion will disappear, producing a less solid tone.

Resonance [0…99]

Specifies the level at which the frequency region in the area of the "Tone" will be boosted. As this **value is increased**, the resonance effect will become stronger.

2–1e: Peaking EQ

Frequency [0…49]

Specifies the center frequency of the frequency range that will be boosted or attenuated by the Peaking EQ. **Increasing this value** will raise the center frequency.

Q [0…29]

Specifies the width of the Peaking EQ frequency band. **Increasing this value** will narrow the frequency band that is boosted or attenuated.

Gain [–18…+18]

Specifies the amount by which the area specified by "Frequency" and "Q" will be boosted or attenuated.

11: Reed Model

This oscillator is a physical model which simulates woodwind reed instruments such as a saxophone or oboe.

By using key velocity or the modulation wheel to control Pressure (the strength with which the reed is blown), you can use performance expressions that are very close to those of an actual woodwind instrument. Also, by modulating the characteristics of the reed, you can produce tonal changes that correspond with the way in which a reed is blown.2–1a: Inst Type
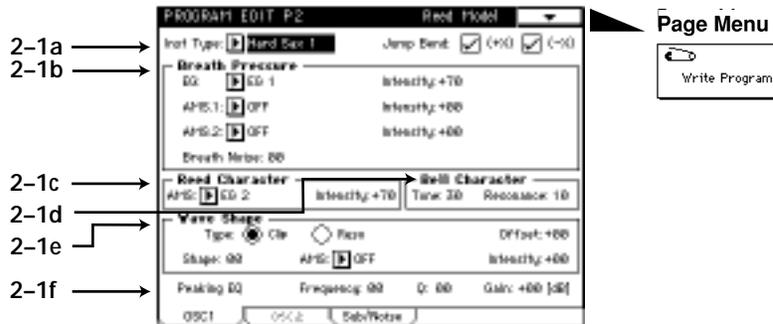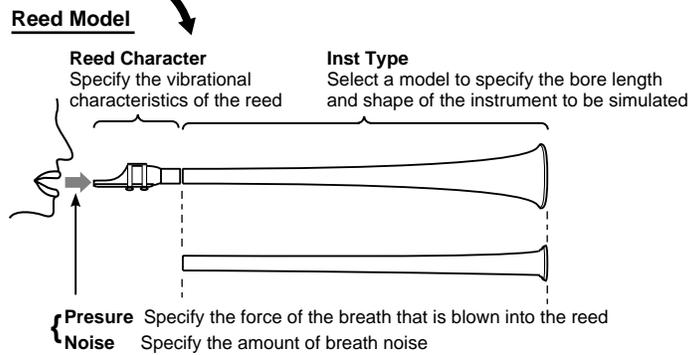
Inst Type   [Hard Sax 1…Reed Synth]

Selects the type of instrument whose bore shape and reed characteristics will be simulated.

Hard Sax 1, Hard Sax 2, Hard Sax 3, Soft Sax 1, Soft Sax 2, Double Reed 1, Double Reed 2, Bassoon, Clarinet, Flute 1, Flute 2, Pan Flute, Ocarina, Shakuhachi, Harmonica 1, Harmonica 2, Reed Synth

Jump Bend (+X)

Specifies how the pitch will change when the joystick is moved in the +**X** direction (toward the right).

If this is **checked**, the pitch will rise in steps by changing the resonance of the bore, as on a flute.

If this is **unchecked**, the pitch will rise smoothly, as on most synthesizers.

Jump Bend (–X)

Specifies how the pitch will change when the joystick is moved in the –**X** direction (toward the left).

✍ If Jump Bend (+X) and Jump Bend (–X) are checked, notes may not sound depending on the position of the joystick and the pitch range setting.

For details on setting the pitch range of the joystick, refer to "1-2c: Bending."

2–1b: Breath Pressure

EG   [EG 1…EG 4, Amp EG]

Selects the EG which will control pressure.

For details on the settings for each EG, refer to "Program Edit P5" for EG 1—4, and "4-2: Amp EG" for Amp EG.

Intensity (Pressure EG Intensity)   [–99…+99]

Specifies the depth and direction of the effect that the EG will have on the pressure.

AMS.1 (Alternate Modulation Source 1)   [OFF…MIDI (CC#83)]

Selects a modulation source 1 (☞page 64 of this manual) that will control pressure. If you select **After Touch**, pressing down on the keyboard will produce the effect of the instrument being blown strongly. If you select **Joy Stick (X)**, moving the joy stick toward the right will produce this effect.

Intensity (Pressure AMS.1 Intensity)   [–99…+99]

Specifies the depth and direction of the change in pressure controlled by AMS.1.

AMS.2 (Alternate Modulation Source 2)   [OFF…MIDI (CC#83)]

Selects a modulation source 2 (☞page 64 of this manual) that will control pressure.

Intensity (Pressure AMS.2 Intensity)   [–99…+99]

Specifies the depth and direction of the change in pressure controlled by AMS.2.

Breath Noise   [0…99]

Specifies the volume level of the breath noise.

Since this uses the signal from the noise generator, the filter of the noise generator can be used to modify the tone of the noise.

2–1c: Reed Character

AMS (Alternate Modulation Source)   [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will modulate the characteristics of the reed.

Intensity (Reed AMS Intensity)   [–99…+99]

Specifies the depth of the modulation effect that "AMS" will have on the reed.

2–1d: Bell Character

Tone   [0…99]

Specifies the tone of the bell. As this **value is increased**, the low frequency portion will disappear, producing a less solid tone.

Resonance   [0…99]

Specifies the level at which the frequency region in the area of the "Tone" will be boosted. As this **value is increased**, the resonance effect will become stronger.

2–1e: Wave Shape

Type (Wave Shape Table Type)   [Clip/Reso]

Use **the radio buttons** to select the wave shaping table which will modify the input waveform. For the way in which the table will modify the waveform, refer to the Wave Shape diagram shown in **01: Standard** (☞page 16 of this manual).

Offset   [–99…+99]

Specifies the offset value that will be added to the Reed OSC signal that is input to wave shaping.

Shape   **[0…99]**

Specifies the character of the table that will shape the input waveform. For details on how the waveform will change, refer to the "Wave Shape" diagram (☞page 16 of this manual) for the **01: Standard OSC**.

AMS (Alternate Modulation Source)   **[OFF…MIDI (CC#83)]**

Selects a modulation source (☞page 64 of this manual) that will control "Wave Shape."

Intensity (Shape AMS Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS."

2–1f: Peaking EQ

**Frequency**   **[0…49]**

Specifies the center frequency of the range that will be boosted or attenuated by the Peaking EQ. **Increasing this value** will raise the center frequency.

Q   **[0…29]**

Specifies the width of the Peaking EQ frequency band. **Increasing this value** will narrow the frequency band that is boosted or attenuated.

Gain   **[–18…+18]**

Specifies the amount by which the range specified by "Frequency" and "Q" will be boosted or attenuated.

Parameters

**Prog.
Edit
P2**

12: Plucked String Model

This oscillator is a physical model which simulates plucked string instruments such as a guitar or bass guitar. You can specify aspects of the model such as the attack waveform that is produced when the string is plucked by a pick or finger, the characteristics of the string, the location of the pickup, etc
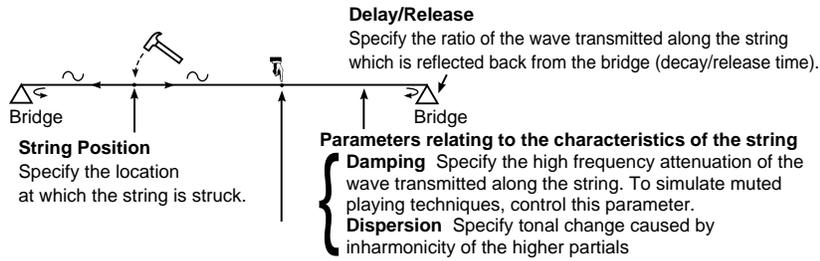
Signal Flow

| String Model | → | Pickup | → | Low EQ & Low Boost | → |
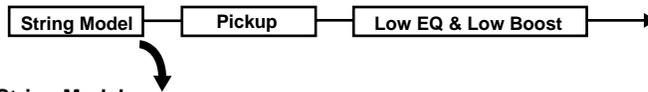
String Model

Parameters relating to the attack waveform

Attack Level Specify the strength of playing (the level of the attack waveform).
Noise Specify the level and tone of the noise included in the attack waveform.
Attack Curve Specify the envelope of the attack waveform.

Delay/Release
Specify the ratio of the wave transmitted along the string which is reflected back from the bridge (decay/release time).

Bridge   Bridge

String Position
Specify the location at which the string is struck.

Parameters relating to the characteristics of the string

Damping Specify the high frequency attenuation of the wave transmitted along the string. To simulate muted playing techniques, control this parameter.
Dispersion Specify tonal change caused by inharmonicity of the higher partials

Harmonics Position Specify the string location to be pressed to play harmonics
Harmonics Mod.Source / Mod.Int. Specify the controller which will control the harmonics effect, and the depth of control.

Page Menu

Write Program

```
PROGRAM EDIT P2    Plucked String Model   ▼
```
2–1a → Attack / Attack Curve
2–1b → Attack Level ██ Velocity +00 / Curve Up: 58 Velocity +00
       Noise Level: 30 Velocity +00 / Curve Down 30 Velocity +00
2–1c → String
       Picking Position: 80 AMS ▶ OFF   Intensity: +00
       Damp: 48 KTr: +48 AMS ▶ OFF   Intensity: +00
       Decay: 80 KTr: +00   Release: 40
       Dispersion: 58   AMS ▶ OFF   Intensity: +00
2–1d → Harmonics
       Position: 64   Control ▶ OFF   Intensity: +00
2–1e → ☑ Pickup Position: 10 AMS ▶ OFF   Intensity: +00
2–1f → Low EQ   Frequency: 30 Gain: +00 [dB] Low Boost: 00
       OSC1 | OSC2 | Sub/Noise

2–1a: Attack

Attack Level   **[0…99]**

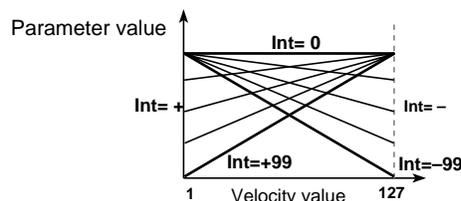Specifies the force with which the string is plucked.

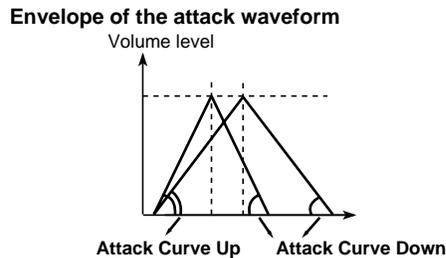**Velocity**   **[–99…+99]**

Specifies the depth and direction of the effect that velocity will have on "Attack Level." The effect will be as shown in the following diagram.

Parameter value

Int= 0

Int= +   Int= −

Int=+99   Int=−99

1   Velocity value   127

Noise Level **[0…99]**

Specifies the level of the noise component that is included in the attack waveform. As this **value is increased**, a greater portion of noise will be included in the attack, and the sound will be brighter with more overtones. The noise signal used here is taken from the output of the noise generator.

Velocity (Noise Level Velocity Control) **[–99…+99]**

Specifies the depth and direction of the effect that velocity will have on "Noise Level." For the way in which the effect occurs, refer to "Velocity (☞page 36 of this manual)."

2–1b: Attack Curve

Curve Up **[0…99]**

Specifies the steepness of the rising edge of the attack waveform. When the rising or falling edge is steep, the tone will be harder.

Envelope of the attack waveform
Volume level

Attack Curve Up   Attack Curve Down

Velocity (Curve Up Velocity Control) **[–99…+99]**

Specifies the depth and direction of the effect that velocity will have on "Curve Up." For the way in which the effect occurs, refer to "Velocity (☞page 36 of this manual)."

Curve Down **[0…99]**

Specifies the steepness of the falling edge of the attack waveform.

Velocity (Curve Doun Velocity Control) **[–99…+99]**

Specifies the depth and direction of the effect that velocity will have on "Curve Down." For the way in which the effect occurs, refer to "Velocity (☞page 36 of this manual)."

2–1c: String

Picking Position **[0…99]**

Specifies the location at which the string will be plucked. A setting of **0** is the end of the string, **50** is the middle of the string, and **99** is the other end of the string.

AMS (Alternate Modulation Source) **[OFF…MIDI (CC#83)]**

Selects a modulation source (☞page 64 of this manual) that will control "Picking Position."

Intensity (Picking Position AMS Intensity) **[–99…+99]**

Specifies the depth and direction of the effect of "AMS."

Damp **[0…99]**

Specifies the amount of high-frequency attenuation that will be produced by the characteristics of the string and by how the string is pressed.

As this **value is increased**, the high-frequency components of the vibration in the string will be attenuated (dampened) more strongly, producing a darker sound. In general, this parameter should be set to a higher value to simulate instruments which use soft strings or which have no frets, and to a lower value to simulate instruments which use hard strings or which have frets.

Parameters

Prog.
Edit
P2

KTr (Damp Keyboard Track) [–99…+99]

Specifies how the Damp amount will be affected by the keyboard location.

With **positive (+)** settings, the Damp value will increase as you play notes above C4. With **negative (–)** settings, the Damp will decrease as you play notes above C4.
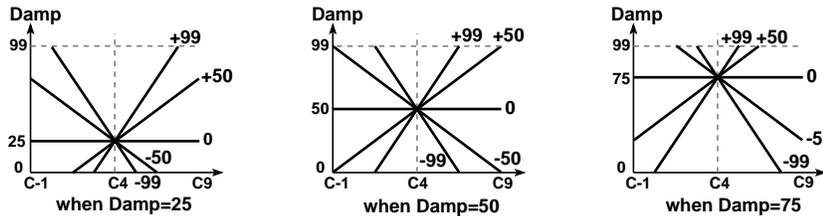
AMS (Alternate Modulation Source) [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control "Damp."

Intensity (Damp AMS Intensity) [–99…+99]

Specifies the depth and direction of the effect that "AMS" will have.

Decay [0…99]

Specifies the decay time over which the sound will decay if you continue pressing a note. **Higher settings of this value** will produce a longer decay time.
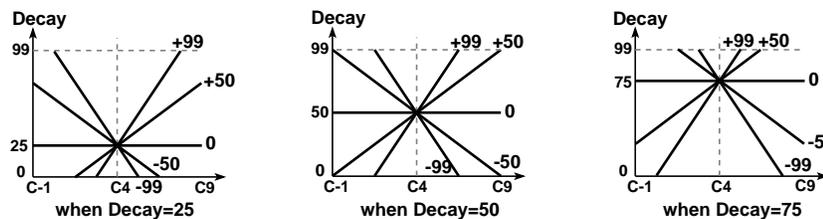
⚠ Depending on the settings of "4-2: Amp EG", the setting you make here may not have audible results. If you raise the EG break level and sustain level, it will be easier to hear the result of this setting.

KTr (Decay Keyboard Track) [–99…+99]

Specifies how the Decay amount will be affected by the keyboard location.

With **positive (+)** settings, the decay will become faster as you play notes above C4. With **negative (–)** settings, it will become slower.

Release [0…99]

Specifies the length of time over which the sound will decay after you release the note. **Higher settings of this value** will produce a longer release time.

⚠ Depending on the settings of "4-2: Amp EG", the setting you make here may not have audible results. You may need to raise the EG release level, it will be easier to hear the result of this setting.

Dispersion [0…99]

Specifies the inharmonicity of the higher partials relative to the fundamental. With a value of **0**, the partials will be located at integer (whole number) multiples of the fundamental. As this **value is increased**, the partials will move further away from integer multiple locations. In general, thin and flexible strings can be simulated by a low "Dispersion" value, and thick and stiff strings can be simulated by a high "Dispersion" value.

If this value is raised excessively, the pitch may become unstable.

AMS (Alternate Modulation Source) [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control "Dispersion."

Intensity (Dispersion AMS Intensity) [–99…+99]

Specifies the depth and direction of the effect of "AMS."

2–1d: Harmonics

Position [0…99]

Specifies the location at which the string will be pressed to play harmonics.

Control [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control the harmonics effect.

Intensity (Harmonics Control Intensity) [–99…+99]

Specifies the depth and direction of the control that "AMS" will have on the harmonics effect.

When making the Position setting, you must assign Control to a controller other than OFF, and raise the Intensity value. The decay time of the harmonics effect will differ depending on the keyboard location that you play.

2–1e: Pickup

Pickup

If this is **checked**, the sound will be passed through a simulated pickup. If this is **not checked**, the sound will remain unchanged.

Position, AMS, and Intensity can be set when Pickup has been **checked**.

Position [0…99]

Adjusts the change in tone that results from differences in pickup location.

AMS (Alternate Modulation Source) [OFF…MIDI (CC#83)]

Selects a modulation source (☞p64) that will control "Pickup."

Intensity (Pickup Position AMS Intensity) [–99…+99]

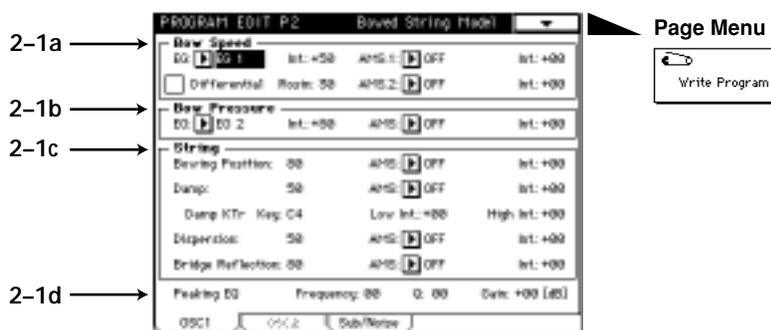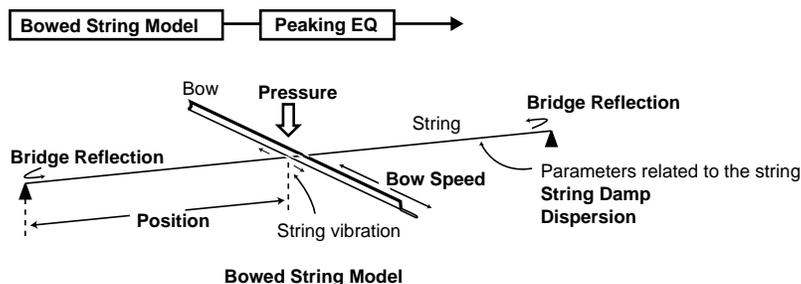Specifies the depth and direction of the effect of "AMS."

2–1f: Low EQ

Frequency [0…49]

Specifies the cutoff frequency of the Low EQ.

Gain [–18…+18]

Specifies the gain of the Low EQ.

Low Boost [0…99]

Specifies how the low frequency range will be emphasized. **Raising this value** will cause the low frequency range to be emphasized more strongly.

Parameters

Prog.
Edit
P2

13: Bowed String Model

This oscillator is a physical model which simulates the sound of a bowed string instrument such as a violin or cello. By controlling the bowing speed and the bowing pressure, you can create performance expressions that are very close to those of an actual bowed string instrument.

Bowed String Model

2–1a: Bowing Speed

EG   **[EG 1…EG 4, Amp EG]**

Selects the EG which will control bowing speed (the speed at which the bow moves across the string).

Int. (Speed Modulation EG Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "EG" With negative (–) settings, the direction of the bow speed will be inverted.

AMS.1 (Alternate Modulation Source 1)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 1 (☞page 64 of this manual) that will control bowing speed.

Instead of using an EG to modify the bowing speed, you can use the Ribbon Controller or Joy Stick to simulate bowing without using an EG.

Int. (Speed AMS.1 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS.1."

AMS.2 (Alternate Modulation Source 2)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 2 (☞page 64 of this manual) that will control bowing speed.

Int. (Speed AMS.2 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS.2."

Differential

If this is **not checked**, the value produced by EG, AMS.1 and AMS.2 will be used as the bowing speed. If you wish to use EG to control the bowing speed, leave this item **un-checked**.

If this is checked, the rate of change of EG, AMS.1 and AMS.2 will be used as the bowing speed.

• Using the ribbon controller to control bowing speed

As an example, we will assume that you have set AMS.1 to **Ribbon (X)**. In order to control bowing speed using the ribbon controller alone, raise the Int. (Speed AMS.1 Intensity) value, and set Int. (Speed Modulation EG Intensity) to **0**. Check Differential.

When you are pressing the ribbon controller, the bowing speed will be zero, so there will be no sound. As you slide your finger toward the right over the ribbon controller, the speed at which your finger moves will be the bowing speed, and sound will be produced. As you slide your finger to left and right, the bowing speed will change from positive →zero→ negative→ zero→positive, allowing you to produce performance expressions that are very similar to those of actually moving a bow back and forth.

Rosin   [0…99]

Specifies the coefficient of static friction between the bow and the string. (This corresponds to the amount of rosin on the bow.)

Higher values will increase the friction between the bow and string. When this value is in the region of **0**, it will be difficult for playing strength to be transmitted to the string.

2–1b: Bow Pressure

EG   [EG 1…EG 4, Amp EG]

Selects the **EG** which will control the pressure of the bow on the string (bow pressure).

Int. (Press Modulation EG)   [–99…+99]

Specifies the depth and direction of the effect that the "EG" will have on bow pressure. If this value is low, the bow will rest lightly on the string.

AMS (Alternate Modulation Source)   [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control bow pressure.

Int.(Press AMS Intensity)   [–99…+99]

Specifies the depth of the effect produced by "AMS."

2–1c: String

Bowing Position   [0…99]

Specifies the location at which the bow contacts the string. A setting of **0** is the end of the string, **50** is near the middle, and **99** is at the other end.

AMS (Alternate Modulation Source)   [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control "Bowing Position."

Changing the location at which the string is bowed will also change the overtone structure.

Int. (Bowing Position AMS Intensity)   [–99…+99]

Specifies the depth and direction of the effect of "AMS."

Damp   [0…99]

Specifies how the high frequency components will be attenuated by the characteristics of the string and by the way in which the string is pressed onto the fingerboard of the violin or cello.

As this **value is increased**, the high frequency components of the wave transmitted along the string will be attenuated more greatly, producing a darker sound. In general, you should use higher values to simulate instruments which have flexible strings or unfretted instruments, and lower values to simulate instruments with stiff strings or fretted instruments.

AMS (Alternate Modulation Source)   [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control "Damp."

Int. (Damp AMS Intensity)   [–99…+99]

Specifies the depth and direction of the effect of "Damping Mod.Source."

Parameters

**Prog.
Edit
P2**

Damp KTr Key   [C–1…G9]

Specifies the key above and below which keyboard tracking will begin to apply to the "Damp" effect.

Low Int   [–99…+99]

Specifies the depth and direction in which the "Damp" amount will change for notes below the "Damp KTr Key." **Positive (+)** settings will cause "Damp" to increase for notes below the "Damp KTr Key." **Negative (–)** settings will cause "Damp" to decrease for notes below the "Damp KTr Key."

High Int   [–99…+99]

Specifies the depth and direction in which the "Damp" amount will change for notes above the "Damp KTr Key." **Positive (+)** settings will cause "Damp" to increase for notes above the "Damp KTr Key." **Negative (–)** settings will cause "Damping" to decrease for notes above the "Damping KTr Key."

Dispersion   [0…99]

Specifies the inharmonicity of the higher partials relative to the fundamental. With a value of **0**, the partials will be located at integer (whole number)x multiples of the fundamental. As this value is increased, the partials will move further away from integer multiple locations. In general, thin and flexible strings can be simulated by a low "Dispersion" value, and thick and stiff strings can be simulated by a high "Dispersion" value.

🔔 If this value is raised excessively, the pitch may become unstable.

AMS (Alternate Modulation Source)   [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control "Dispersion."

Intensity (Dispersion AMS Intensity)   [–99…+99]

Specifies the depth and direction of the effect of "AMS."

Bridge Reflection   [0…99]

Specifies the amount of the wave that will be reflected at the end of the string. **Higher values** will make the notes sound more easily. With a setting of **0** there will be no reflection at all.

AMS (Alternate Modulation Source)   [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control "Bridge Reflection."

Int. (Bridge Reflection AMS Intensity)   [–99…+99]

Specifies the depth and direction of the effect of "AMS."

2–1d: Peaking EQ

Frequency   [0…49]

Specifies the center frequency at which the peaking EQ will boost (attenuate) the sound.

Q   [0…29]

Specifies the width of the region that will be boosted (attenuated) by the peaking EQ. With a setting of **0**, a wide region will be affected. With a setting of **29**, only a narrow region close to the center frequency will be boosted (attenuated).

Gain   [–18…+18]

Specifies the gain by which the peaking EQ will boost or attenuate.

2–2: OSC 2

OSC2 parameters have the same structure as OSC1 parameters. Refer to "2-1: OSC 1."

2–3: Sub/Noise

Here, you can make settings for the sub-oscillator and the noise generator.

The sub oscillator lets you select one of four basic waveforms. In the mixer section, the signal from the sub oscillator is mixed with the signals of oscillators 1 and 2.

The noise generator produces white noise. The noise signal that is generated passes through a dedicated filter, and is mixed by the mixer section with the signals from the sub oscillator and oscillators 1 and 2.
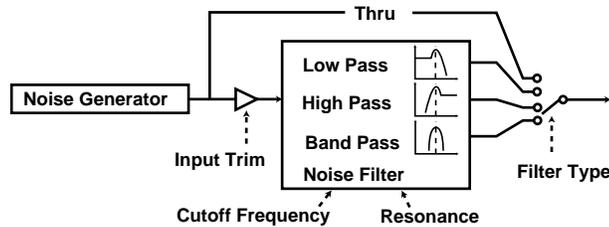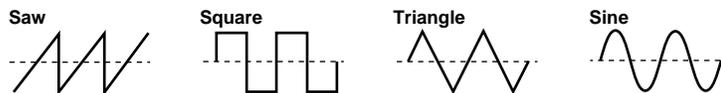

2–3a: Sub Oscillator

Wave Form   **[Saw, Square, Triangle, Sine]**

Specifies the type of filter that will be applied to the output from the noise generator.

Prog.
Edit
P2

Parameters

2–3b: Noise Generator

Here, you can make various settings for the noise generator.

Filter Type   [Thru, Low Pass, High Pass, Band Pass]

Selects the type of filter that will be applied to the output of the noise generator.

When **Thru** is selected, the Input Trim, Frequency, AMS.1, Intensity (Cutoff Frequency AMS.1 Intensity), AMS.2, Intensity (Cutoff Frequency AMS.2 Intensity), and Resonance settings will be unavailable.

Input Trim   [0…99]

Specifies the input level to the dedicated noise filter.

Cutoff Frequency   [0…99]

Specifies the cutoff frequency of the noise signal filter. For the characteristics of each filter type, refer to "3-2b:Filter1" (☞page 47 of this manual).

AMS.1 (Alternate Modulation Source 1)   [OFF…MIDI (CC#83)]

Selects a modulation source 1 (☞page 64 of this manual) that will control the "Cutoff Frequency."

Intensity (Cutoff Frequency AMS.1 Intensity)   [–99…+99]

Specifies the depth and direction of the effect of "AMS.1."

AMS.2 (Alternate Modulation Source 2)   [OFF…MIDI (CC#83)]

Selects a modulation source 2 (☞page 64 of this manual) that will control the "Cutoff Frequency."

Intensity (Cutoff Frequency AMS.2 Intensity)   [–99…+99]

Specifies the depth and direction of the effect of "AMS.2."

Resonance   [0…99]

This boosts the frequency region specified by the "Cutoff Frequency" to add character to the sound. Since the filter characteristics differ from the filter type of the "3-2b: Filter 1 ," "3-4b: Filter 2" the resulting effect will be different even if "Type," "Cutoff Frequency" and "Resonance" settings are identical.

Program Edit P3

Here, you can make settings for the mixer and filter.
For the way in which the mixer, filter and amp sections are connected, refer to "3-2a: Filter Routing."

3–1: Mixer

The mixer allows you to set the levels at which the five signals (OSC 1, OSC 2, Noise Generator, Feedback, Sub OSC) will be combined into the two mixer outputs. You can also select a modulation source to control each level, and specify its intensity.

Page Menu
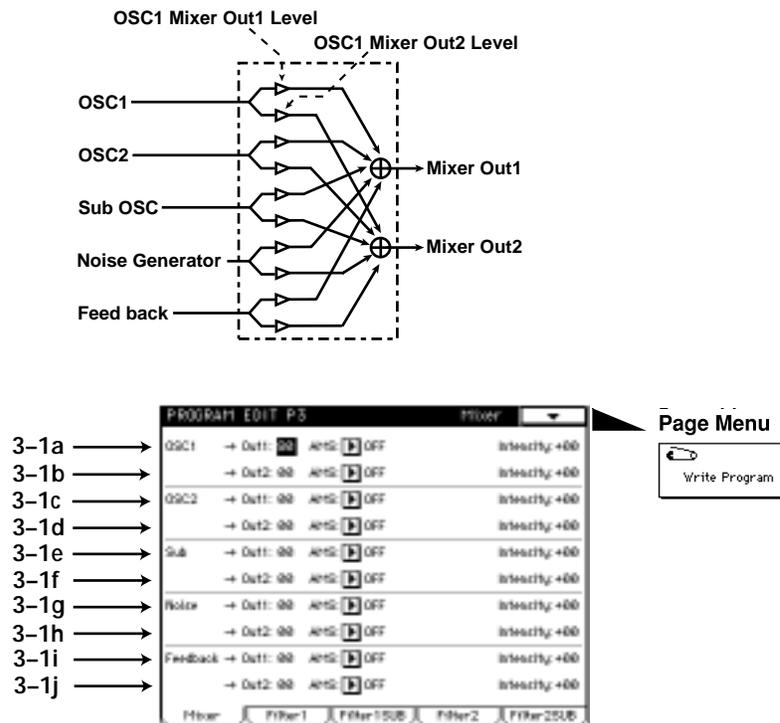
3–1a: OSC 1 → Out 1

These parameters adjust the level at which the oscillator 1 signal is output from mixer output 1, and specify a modulation source that will control this level.

Output Level [00…99]

Specifies the signal level that will be output to mixer output 1.

AMS (Alternate Modulation Source) [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control "output level."

Intensity (Level AMS Intensity) [–99…+99]

Specifies the depth and direction of the effect of "AMS."

With **positive (+) settings**, higher values of the modulation source will increase the "output level." With **negative (–) settings**, lower values of the modulation source will increase the "output level." If **EG** or **LFO** has been selected as the "AMS", **positive (+) settings** will cause the original phase of the EG or LFO to be used, and **negative (–) settings** will invert the phase.

Prog.
Edit
P3

3–1b: OSC 1 → Out 2

These parameters adjust the level at which the oscillator 1 signal is output from mixer output 2, and specify a modulation source that will control this level.
Refer to the above explanation of "3-1a: OSC1 → OUT1."

3–1c: OSC 2 → Out 1

These parameters adjust the level at which the oscillator 2 signal is output from mixer output 1, and specify a modulation source that will control this level.
Refer to the above explanation of "3-1a: OSC1 → OUT1."

3–1d: OSC 2 → Out 2

These parameters adjust the level at which the oscillator 2 signal is output from mixer output 2, and specify a modulation source that will control this level.
Refer to the above explanation of "3-1a: OSC1 → OUT1."

3–1e: Sub → Out 1

These parameters adjust the level at which the sub oscillator signal output is output from mixer output 1, and specify a modulation source that will control this level.
Refer to the above explanation of "3-1a: OSC1 → OUT1."

3–1f: Sub → Out 2

These parameters adjust the level at which the sub oscillator signal output is output from mixer output 2, and specify a modulation source that will control this level.
Refer to the above explanation of "3-1a: OSC1 → OUT1."

3–1g: Noise → Out 1

These parameters adjust the level at which the output of the noise generator is output from mixer output 1, and specify a modulation source that will control this level.
Refer to the above explanation of "3-1a: OSC1 → OUT1."

3–1h: Noise → Out 2

These parameters adjust the level at which the output of the noise generator is output from mixer output 2, and specify a modulation source that will control this level.
Refer to the above explanation of "3-1a: OSC1 → OUT1."

3–1i: Feedback → Out 1

These parameters adjust the level at which the feedback from the amp section is output from mixer output 1, and specify a modulation source that will control this level.
Refer to the above explanation of "3-1a: OSC1 → OUT1."

⚠ Raising the Feedback level excessively may cause the sound to distort.

3–1j: Feedback → Out 2

These parameters adjust the level at which the feedback from the amp section is output from mixer output 2, and specify a modulation source that will control this level.
Refer to the above explanation of "3-1a: OSC1 → OUT1."

⚠ Raising the Feedback level excessively may cause the sound to distort.

3–2: Filter 1

Here, you can make settings for one of the two multi-mode filters. Each multi-mode filter can be set to one of five filter types.
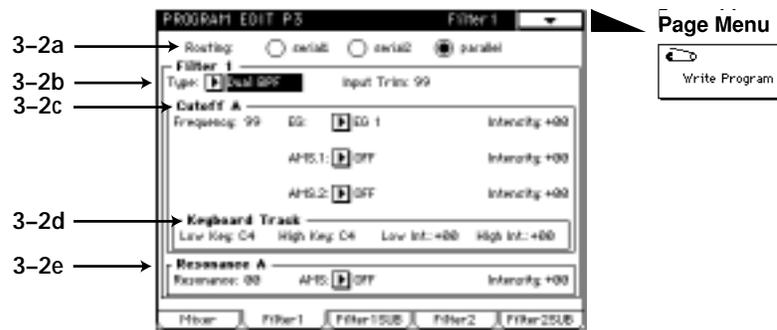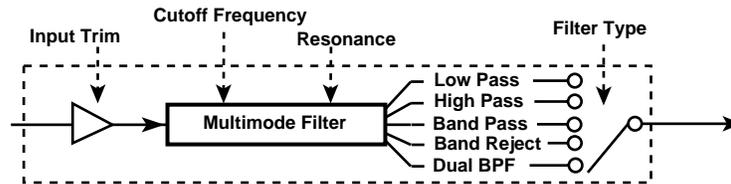
3–2a: Routing (Filter Routing)   [serial 1/serial 2/parallel]

Use **the radio buttons** to select the way in which filters 1 and 2 will be combined.

The connections from mixer output → filter → amp can be routed in the following three ways.
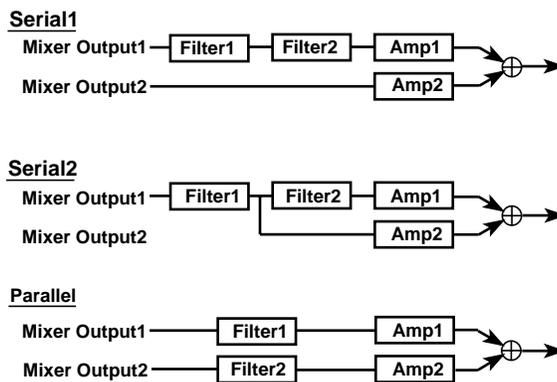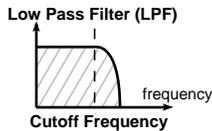
3–2b: Filter 1

Type   **[Low Pass, High Pass, Band Pass, Band Reject, Dual BPF]**
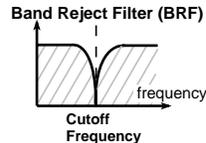
Selects the filter type.

When **Dual BPF** is selected, the "3-3: Filter 1 SUB" parameters can also be set. When you select **Dual BPF**, the "3-2c: Cutoff" and "3-2e: Resonance" parameter names will change to Cutoff A and Resonance A respectively.
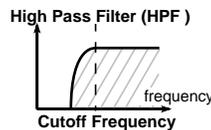
Filter Types and Cutoff Frequency
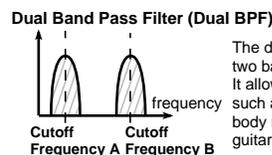
Low Pass Filter (LPF)

A low pass filter is the most commonly-used type of filter, and passes the range of frequencies that lie below the cutoff frequency, and cuts the high range. Cutting the higher partials will cause a bright sound to become darker (more mellow).

High Pass Filter (HPF)

A high pass filter passes the range of frequencies that lie above the cutoff frequency, and cuts the low range. This type of filter is used when you wish to make the sound thinner. However, raising the cutoff frequency excessively will drastically reduce the volume.

Band Pass Filter (BPF)

A band pass filter passes the range of frequencies in the vicinity of the cutoff frequency, and cuts the   ranges above and below. This type of filter is used when you wish to emphasize a particular portion of the sound.
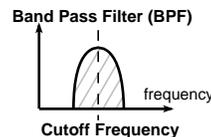
Band Reject Filter (BRF)

A band reject filter cuts only the range in the vicinity of the cutoff frequency, and passes the rest of the sound. This type of filter gives a unique character to the sound.

Dual Band Pass Filter (Dual BPF)

The dual band pass filter places two band pass filters in parallel. It allows you to simulate sounds such as human voice and the body resonances of a violin or guitar.

Input Trim   **[0…99]**

Specifies the level of the input to filter 1.

If this value is raised, the sound may become distorted if the resonance setting is high, etc.

3–2c: Cutoff/Cutoff A (Cutoff Frequency)

Frequency   **[0…99]**

Specifies the cutoff frequency of filter 1. As this **value is increased**, the cutoff frequency will rise.

Since the **BPF** and **Dual BPF** filter types use filters with differing characteristics, their actual cutoff frequency may differ even if their settings are identical.

EG (Cutoff Frequency Modulation EG)   **[EG1…EG4, Amp EG]**

Selects the EG that will create time-varying change in the cutoff frequency of filter 1.

Intensity (Cutoff Frequency Mod. EG Intensity)   **[–99…+99]**

Specifies the depth and direction of the control that "EG (Cutoff Frequency Modulation EG)" will have on the cutoff frequency. With **positive (+) settings** of this parameter, the tone will become brighter when the various EG levels rise into the + area (the setting of the "Frequency" will be reached when the EG levels are at **0**), and darker when the EG levels fall into the – area. With **negative (–) settings** of this parameter, the tonal change will take place in the opposite direction.

AMS.1 (Alternate Modulation Source 1)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 1 (☞page 64 of this manual) that will control "Frequency."

Intensity (Cutoff Frequency AMS.1 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect that "AMS.1" will have on the cutoff frequency.

AMS.2 (Alternate Modulation Source 2)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 2 (☞page 64 of this manual) that will control "Frequency."

Intensity (Cutoff Frequency AMS.2 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect that "AMS.2" will have on the cutoff frequency.

3–2d: Keyboard Track

Keyboard tracking settings specify how the cutoff frequency of filter 1 will be varied according to keyboard position.

Low Key   [C-1…G9]

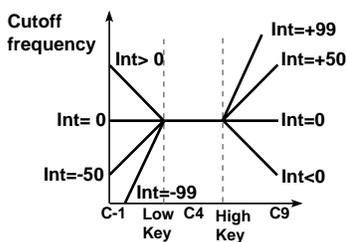Specifies the key at which Lower keyboard tracking will begin.

High Key   [C-1…G9]

Specifies the key at which Higher keyboard tracking will begin.

Low Int.   [–99…+99]

Specifies the depth and direction of cutoff frequency change that will occur below the "Low Key." With a setting of **–50**, the change will match the change in pitch.

High Int.   [–99…+99]

Specifies the depth and direction of cutoff frequency change that will occur above the "High Key." With a setting of **+50**, the change will match the change in pitch.
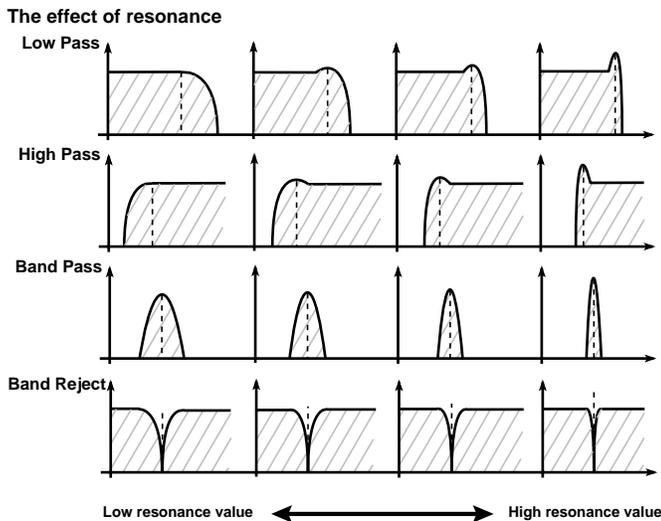

3–2e: Resonance/Resonance A

Resonance   [0…99]

This setting emphasizes the overtones in the region of the "Frequency" to add character to the sound. **Higher values** will produce a stronger effect. With high settings of resonance, the output signal of the filter may distort. If this occurs, reduce the "Input Trim" setting.

With the **Dual BPF** filter type, the overtones in the vicinity of each cutoff frequency will be affected in the same way as by a **BPF**.

The effect of resonance

AMS (Alternate Modulation Source)   [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control the amount of resonance.

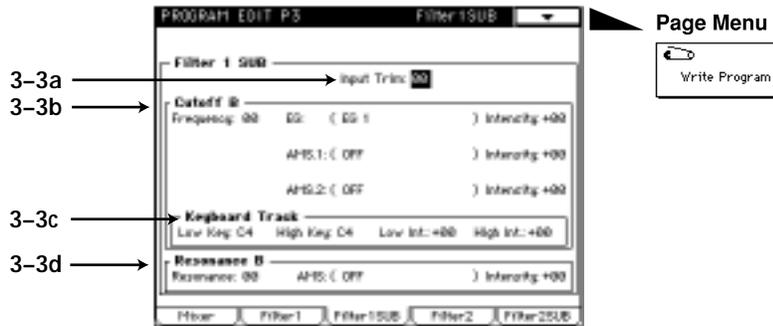**Intensity (Resonance AMS Intensity)**   [–99…+99]

Specifies the depth and direction of the effect that "AMS" will have on the amount of resonance.

Parameters

**Prog.
Edit
P3**

3–3: Filter 1SUB

If the "3-2b: Filter 1" Type parameter was set to **Dual BPF**, you can make settings for the "3-3: Filter 1 SUB" parameters.

Page Menu

3–3a: Input Trim   [0…99]

Specifies the level of the input to filter 1.

If this value is raised, the sound may become distorted if the resonance setting is high, etc.

3–3b: Cutoff B (Cutoff Frequency B)

Frequency   [0…99]

Specifies the cutoff frequency of filter 1. As this value is increased, the cutoff frequency will rise.

Since the **BPF** and **Dual BPF** filter types use filters with differing characteristics, their actual cutoff frequency may differ even if their settings are identical.

EG Intensity (Cutoff Frequency Modulation EG Intensity)   [–99…+99]

Specifies the depth and direction of the effect that the EG specified by "3-2: Filter 1" will have on the cutoff frequency. With **positive (+) settings** of this parameter, positive (+) EG levels will make the sound brighter relative to the value specified by Frequency, and negative (–) EG levels will make the sound darker. (When an EG level is **0**, the value specified by Frequency will be used unchanged.) With **negative (–) settings** of this parameter, the change will take place in the opposite direction of positive (+) settings.

AMS.1 Intensity   [–99…+99]

Specifies the depth and direction of the effect that the AMS.1 specified in "3-2c: Cutoff" will have on the cutoff frequency.

AMS.2 Intensity   [–99…+99]

Specifies the depth and direction of the effect that the AMS.2 specified in "3-2c: Cutoff" will have on the cutoff frequency.

It is not possible to change EG, AMS.1 or AMS.2 in the Filter 1 SUB page.

3–3c: Keyboard Track

Keyboard tracking settings specify how the cutoff frequency of filter 1 will be varied according to keyboard position.

Low Key   [C-1…G9]

Specifies the key at which Lower keyboard tracking will begin.

High Key   [C-1…G9]

Specifies the key at which Higher keyboard tracking will begin.

Low Int. [–99…+99]

Specifies the depth and direction of cutoff frequency change that will occur below the "Low Key." With a setting of –**50**, the change will match the change in pitch.

High Int. [–99…+99]

Specifies the depth and direction of cutoff frequency change that will occur above the "High Key." With a setting of +**50**, the change will match the change in pitch.

3–3d: Resonance B

Resonance [0…99]

This setting emphasizes the overtones in the region of the "Frequency" to add character to the sound. Higher values will produce a stronger effect. With high settings of resonance, the output signal of the filter may distort. If this occurs, reduce the "Input Trim" setting.

With the **Dual BPF** filter type, the overtones in the vicinity of each cutoff frequency will be affected in the same way as by a **BPF**.

AMS Intensity [–99…+99]

Specifies the depth and direction of the effect that the AMS specified in "3-2e: Resonance" will have on the resonance.

Parameters

3–4: Filter 2

Here, you can make settings for one of the two multi-mode filters. Each multi-mode filter can be set to one of five filter types.
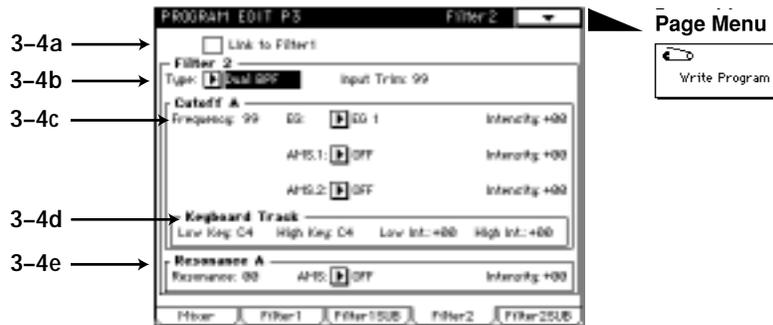
3–4a: Link to Filter 1

If this is **checked**, Filter 2 will be linked to Filter 1, and the following settings will be the same as the settings of Filter 1.

If this is **not checked**, the following parameters can be set for Filter 2.

For details on these parameters, refer to "3-2: Filter 1."

3–4b: Filter 2

3–4c: Cutoff/Cutoff A (Cutoff Frequency)

3–4d: Keyboard Track

3–4e: Resonance/Resonance A

3–5: Filter 2 SUB

When "3-4b: Filter 2" Type parameter is set to **Dual BPF**, you will be able to set various parameters for "3-5: Filter 2 SUB."

For details on these parameters, refer to "3-3: Filter 1 SUB."

If "3-4a: Link to Filter 1" is checked, it is not possible to make "3-5: Filter 2 SUB" settings.

Program Edit P4

Here, you can make volume-related settings.
There are two independent amps, and the signals which are input to each amp are determined by the setting of "3-2a: Routing" (☞page 47 of this manual).

4–1: Amp

4–1a
4–1b
4–1c
4–1d
4–1e

Page Menu

Write Program

4–1a: Amp 1

Amplitude [0…99]

Specifies the volume level of amp 1. The input signal to amp 1 is determined by the "3-2a:Routing" setting

EG (Amplitude Modulation EG) [EG1…EG4, Amp EG]

Selects the EG that will create time-variant change in the volume level of amp 1. For the settings of each EG, refer to "Program Edit P5."

AMS (Alternate Modulation Source) [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control the volume level of amp 1.

Intensity (Amplitude AMS Intensity) [–99…+99]

Specifies the depth and direction of the effect of "AMS" on the volume level.

4–1b: Keyboard Track (Amplitude 1 Keyboard Track)

Low Key [C-1…G9]

Specifies the key at which Lower keyboard tracking will begin.

High Key [C-1…G9]

Specifies the key at which Higher keyboard tracking will begin.

Low Int. [–99…+99]

Specifies the way in which keyboard tracking will affect the volume of notes below the Low Key.

Parameters

Prog.
Edit
P4

High Int.   **[–99…+99]**

Specifies the way in which keyboard tracking will affect the volume of notes below the High Key.
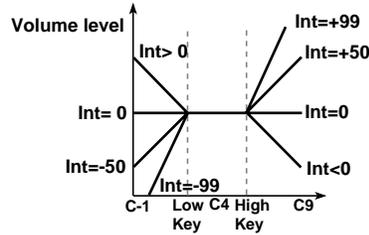
If Low Int. or High Int. are set to positive (+) settings, you will need to lower the "4-1a: Amp 1" Amplitude value.

4–1c: Amp 2

Here you can adjust the settings for Amp 2. These parameters have the same structure as the "4-1a: Amp 1" parameters.

4–1d: Keyboard Track (Amplitude 2 Keyboard Track)

Here you can adjust keyboard tracking settings for Amp 2. These parameters have the same structure as the "4-1b: Keyboard Track" parameters.

4–1e: Pan/Outputs

Pan   **[OFF, L000…C064…R127]**

This sets the panning for input to the insert effect.

If you are not using an insert effect, this sets the panning to output jacks **1/L/MONO** and **2/R**.

With a **setting of OFF**, the sound will not be output to **1/L/MONO** and **2/R**.

L is left, **C** is center, and **R** is right.

AMS (Alternate Modulation Source)   **[OFF…MIDI (CC#83)]**

Selects the modulation source (☞page 36 of this manual) that will move the panning of amp 1 relative to the Pan setting.

Intensity (Panpot AMS Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect of "AMS" on the panning.

Output Level   **[0…127]**

Specifies the output level following the amp.

Send 1   **[0…127]**
Send 2   **[0…127]**

Here, you can specify the input levels to the master effects when insertion effects are not used.

If you are using insertion effects, the input levels to the master effects are specified by the "7-1b: Pan/Width/ Send 1, 2" parameters Send 1 and 2 (☞page 41 in Parameter Guide).

In all modes, you must use an insertion effect when using **bank M** programs. If you do not use an insertion effect, the output level will be decreased.

4-2: Amp EG AMSource

Here, you can make settings for the Amp EG. The Amp EG lets you specify how the sound will change over time. Since the Amp EG can also be used as a general-purpose controller, it can create time-variant change in parameters other than volume.

Time-variant change in volume created by the amp EG

Page Menu
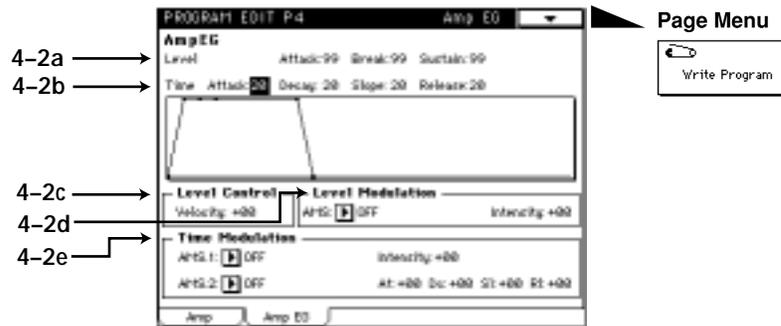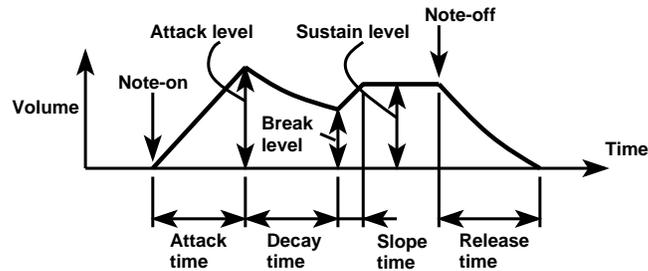
4–2a: Level (Amp EG Level)   [0…99]

Attack (Attack Level)   [0…99]
Specifies the volume that will be reached after the Attack Time has elapsed.

Break (Break Level)   [0…99]
Specifies the volume level that will be reached after the Decay Time has elapsed.

Sustain (Sustain Level)   [0…99]
Specifies the volume level that will be reached after the Slope Time has elapsed.

4–2b: Time (Amp EG Time)

Attack (Attack Time)   [0…99]
Specifies the time from note-on (when a note is played) until the volume reaches the attack level. With a value of **0**, the volume will change instantly. With a value of **99**, the volume will change slowly.

Decay (Decay Time)   [0…99]
Specifies the time from when the attack time ends until the break level is reached.

Slope (Slope Time)   [0…99]
Specifies the time from when the decay time ends until the sustain level is reached.

Release (Release Time)   [0…99]
Specifies the time from note-off (when a note is released) until the volume falls to zero.
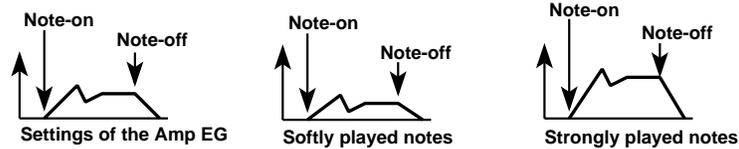
Parameters

Prog.
Edit
P4

4–2c: Level Control

Velocity   **[–99…+99]**

Specifies the depth and direction of the effect that velocity will have on the level of the amp EG.

When " Velocity" is set to a positive (+) value

4–2d: Level Modulation

AMS (Alternate Modulation Source)   **[OFF…MIDI (CC#83)]**

Selects a modulation source (☞page 64 of this manual) that will control the level of the Amp EG.

Intensity (EG Level AMS Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect that "AMS" will have on the level of the Amp EG.

4–2e: Time Modulation

AMS.1 (Alternate Modulation Source 1)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 1 (☞page 64 of this manual) that will control the Amp EG times.

Intensity (EG Time AMS.1 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect that "AMS.1" will have on the Amp EG times.

AMS.2 (Alternate Modulation Source 2)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 2 (☞page 64 of this manual) that will control the Amp EG times.

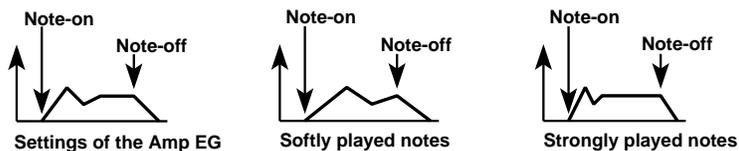**At (Attack Time AMS.2 Intensity)**   **[–99…+99]**
Dc (Decay Time AMS.2 Intensity)   **[–99…+99]**
Sl (Slope Time AMS.2 Intensity)   **[–99…+99]**
Rl (Release Time AMS.2 Intensity)   **[–99…+99]**
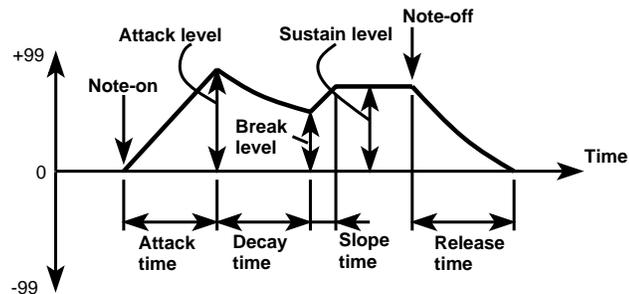
Specifies the depth and direction of the effect that "AMS.2" will have on each EG time.

When the various EG times are set to negative (–) values

Program Edit P5

This section provides four general purpose EGs (envelope generators). The four EGs can be used as modulation sources for the parameters of other sections to create time-variant change in the sound.

5–1: EG 1 AMSource

Page Menu

5–1a
5–1b
5–1c
5–1d
5–1e

5–1a: Level

Start (Start Level)   **[–99…+99]**

Specifies the value at the time of note-on.

Attack (Attack Level)   **[–99…+99]**

Specifies the value that will be reached after the Attack Time has elapsed.

Break (Break Level)   **[–99…+99]**

Specifies the value that will be reached after the Decay Time has elapsed.

Sustain (Sustain Level)   **[–99…+99]**

Specifies the value that will be reached after the Slope Time has elapsed.

Release (Release Level)   **[–99…+99]**

Specifies the value that will be reached after the Release Time has elapsed.

5–1b: Time (Amp EG Time)

Attack (Attack Time)   **[0…99]**

Specifies the time from note-on (when a note is played) until the value reaches the attack level. With a value of **0**, the value will change instantly. With a value of **99**, the value will change slowly.

Parameters

Prog.
Edit
P5

Decay (Decay Time) [0…99]

Specifies the time from when the attack time ends until the Break Level is reached.

Slope (Slope Time) [0…99]

Specifies the time from when the decay time ends until the Sustain Level is reached.

Release (Slope Time) [0…99]

Specifies the time from note-off (when a note is released) until the Release Level is reached.

5–1c: Level Control

Velocity [–99…+99]

Specifies the depth and direction of the effect that velocity will have on the EG levels.

When "Velocity" is set to a positive (+) value
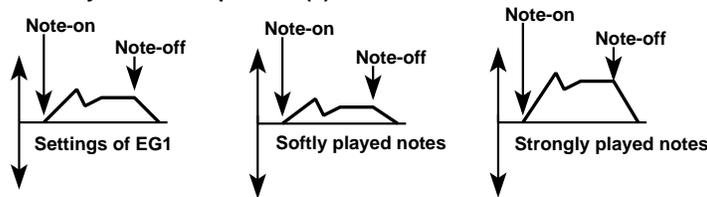
5–1d:Level Modulation

AMS (Alternate Modulation Source) [OFF…MIDI (CC#83)]

Selects a modulation source (☞page 64 of this manual) that will control the level of EG1.

Intensity (EG Level AMS Intensity) [–99…+99]

Specifies the depth and direction of the effect that "AMS" will have on the EG levels.

5–1e: Time Modulation

AMS.1 (Alternate Modulation Source 1) [OFF…MIDI (CC#83)]

Selects a modulation source 1 (☞page 64 of this manual) that will control the EG1 times.

Intensity (EG Time AMS.1 Intensity) [–99…+99]

Specifies the depth and direction of the effect that "AMS.1" will have on the EG times.

AMS.2 (Alternate Modulation Source 2) [OFF…MIDI (CC#83)]

Selects a modulation source 2 (☞page 64 of this manual) that will control the EG1 times.

At (Attack Time AMS.2 Intensity) [–99…+99]
Dc (Decay Time AMS.2 Intensity) [–99…+99]
Sl (Slope Time AMS.2 Intensity) [–99…+99]
Rl (Release Time AMS.2 Intensity) [–99…+99]

Specifies the depth and direction of the effect that "AMS.2" will have on each EG time.

When the various EG times are set to negative (–) values
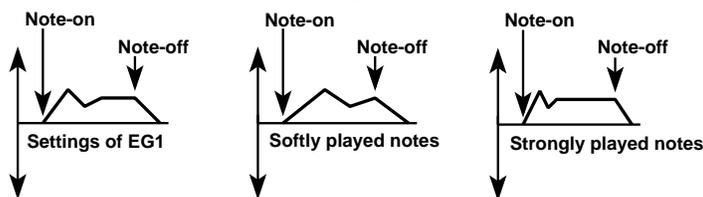
5–2: EG 2 `AMSource`

5–3: EG 3 `AMSource`

5–4: EG 4 `AMSource`

EG 2, EG 3 and EG 4 have the same parameters as EG 1. Refer to "5-1: EG 1."

Parameters

**Prog.
Edit
P5**

Program Edit P6

This section provides four **LFO**s (Low Frequency Oscillators). These LFOs can be used as modulation sources for parameters of other sections, to create cyclic changes in the sound.

6–1: LFO 1   AMSource

6–1a

6–1b

6–1c

6–1d

Page Menu

Write Program

6–1a: Wave Form/Key Sync

Wave Form   **[Triangle 0…ExpSawDown]**

Settings for the general-purpose **LFO**s

0: Triangle 0

1: Triangle 90

2: Tri Random
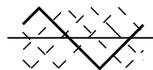
When Key Sync=ON, the starting phase will vary randomly.

3: Sine

4: Saw Up 0

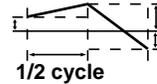**5: Saw Up 180**

6: Saw Down 0

7: Saw Down 180
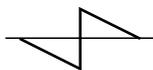
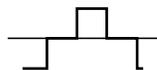**8: Square**
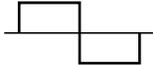
9: Random1(S/H)
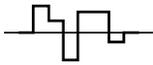
Amplitude and the duration at which each level is held will both change randomly (sample & hold).
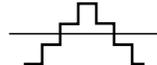
10: Random2 (Vector)

1/2 cycle

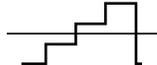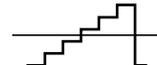Random 2 changes in a straight line toward a value which is determined randomly every 1/2 cycle.
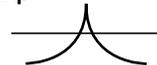
11: Step Tri 4

12: Step Tri 6

13: Step Saw 4

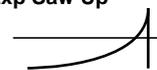**14: Step Saw 6**

15: Exp Tri

16: Exp Saw Up

17: Exp Saw Down

Key Sync   **[OFF/by TIMBRE/by VOICE]**

Use **the radio buttons** to select the key sync setting (i.e., whether or not the phase of the **LFO** waveform will be returned to its initial state when a note-on occurs).

OFF : The **LFO** will operate (cycle) regardless of note-on.

by TIMBRE : Key sync will occur for the **LFOs** of all voices at the time of the first note-on that occurs in a state when no keys are on.

by VOICE : Key sync will occur independently for the individual **LFO** of the voice for which note-on occurred.

Key Sync SW = byTIMBRE / byVOICE

Key Sync SW = Off
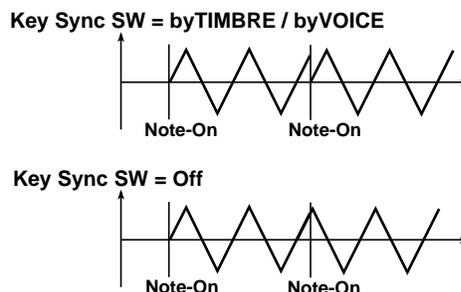
6–1b: Frequency

If you used **the radio buttons** to select Frequency, set the following parameters to specify the LFO frequency.

F (Frequency)   **[0(0Hz)…199(60Hz)]**

Specifies the frequency of the **LFO**.

AMS.1 (Alternate Modulation Source 1)   **[OFF…MIDI (CC#83)]**

Select a modulation source 1 (☞page 64 of this manual) that will control the LFO frequency.

Intensity (Frequency AMS.1 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect that "AMS.1" will have on the "F (Frequency)" value.

AMS.2 (Alternate Modulation Source 2)   **[OFF…MIDI (CC#83)]**

Selects a modulation source 2 (☞page 64 of this manual) that will control the LFO frequency.

Intensity (Frequency AMS.2 Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect that "AMS.2" will have on the "F (Frequency)" value.
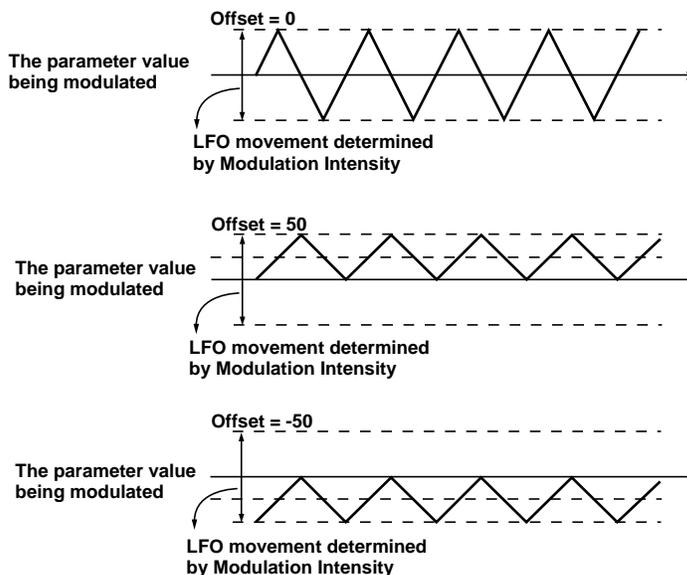
6–1c: MIDI Sync

If you used **the radio buttons** to select MIDI Sync, set the following parameters to synchronize the LFO frequency to MIDI Clock.

When the Global mode parameter "1-1d: MIDI Clock" (☞page 119 in Parameter Guide) is set to **Internal** the LFO will synchronize to the tempo specified by Prog. Temp, and if it is set to External the LFO will synchronize to the MIDI Clock messages received from an **External** MIDI device.

MIDI Sync Base   **[♪, ♪₃, ♩, ♩₃, ♩., ♩₃, ♩., ○]**
MIDI Sync Time   **[1…16]**

This is relative to the tempo determined by the MIDI clock, these settings specify the note length (Base) and its multiple (Time) that will set the period of the synchronized LFO. For example if "MIDI Sync Base" is ♩ (quarter note) and "MIDI Sync Time" is **4**, the LFO period will be four beats.

Prog. Temp   **[40…240]**

Selects the tempo that will be used when MIDI Clock is set to **Internal**.

Parameters

Prog. Edit P6

6–1d: Amplitude Modulation

AMS (Alternate Modulation Source 1)   **[OFF…MIDI (CC#83)]**

Selects a modulation source (☞page 64 of this manual) that will control the amplitude of the LFO waveform.

Intensity (Amplitude AMS Intensity)   **[–99…+99]**

Specifies the depth and direction of the effect that "AMS" will have on the amplitude of the LFO waveform.

Offset   **[–50…+50]**

Specifies the center value of the LFO waveform.

Fade In Time   **[0…99]**

Specifies the time over which the amplitude of the LFO will increase from 0 until it reaches the maximum value.

Offset = 0

The parameter value being modulated

LFO movement determined by Modulation Intensity

Offset = 50

The parameter value being modulated

LFO movement determined by Modulation Intensity

Offset = -50

The parameter value being modulated

LFO movement determined by Modulation Intensity

6–2: LFO 2 `AMSource`

6–3: LFO 3 `AMSource`

6–4: LFO 4 `AMSource`

LFO 2, LFO 3, and LFO 4 have the same parameter as LFO 1. Refer to "6-1: LFO 1 "

Program Edit P7

Here, you can make settings for the insertion effects.
For details on the parameters etc., refer to Parameter Guide page 44, "Program Edit P7."

Program Edit P8

Here, you can make settings for the master effects.
For details on the parameters etc., refer to Parameter Guide page 44 "Program Edit P7."

Parameters

**Prog.
Edit
P7/8**

4. Data

Retrigger Controller List

00: OFF
01: Velocity (Soft)
02: Velocity (Medium)
03: Velocity (Hard)
04: Note Number(Linear)
05: Note Number(Exp)
06: After Touch
07: Joy Stick (X)
08: Joy Stick (+Y)
09: Joy Stick (-Y)
10: AfterTouch+JS(+Y)
11: Ribbon (X)
12: Ribbon (+X)
13: Ribbon (-X)
14: Ribbon (Z)
15: Foot Pedal (CC#04)
16: Value Slider(CC#18)
17: MIDI (CC#19)
18: SW1 (CC#80)
19: SW2 (CC#81)
20: Foot SW (CC#82)
21: MIDI (CC#83)

Modulation Source List

00: OFF
01: EG 1
02: EG 2
03: EG 3
04: EG 4
05: Amp EG
06: LFO 1
07: LFO 2
08: LFO 3
09: LFO 4
10: Portamento
11: Velocity (Soft)
12: Velocity (Medium)
13: Velocity (Hard)
14: Note Number(Linear)
15: Note Number(Exp)
16: Note Split(Hi)
17: Note Split(Low)
18: After Touch
19: Joy Stick (X)
20: Joy Stick (+Y)
21: Joy Stick (-Y)
*22: AfterTouch+JS(+Y)
23: Ribbon (X)
24: Ribbon (+X)
25: Ribbon (-X)
26: Ribbon (Z)
27: Foot Pedal (CC#04)
28: Value Slider(CC#18)
29: MIDI (CC#19)
30: SW1 (CC#80)
31: SW2 (CC#81)
32: Foot SW (CC#82)
33: MIDI (CC#83)

*This After Touch is half of the effect of 18:AfterTouch.

Precautions

Regarding program change (MIDI) reception

Depending on the oscillator type used by a program, some time may be required after a program change is received until a **bank M** program is actually selected. When selecting programs, please leave ample time between the program change and the following note-on.

Regarding noise

The effect settings and the parameter settings of the oscillator used by the program may affect each other so as to cause noise to appear in the sound. Also, if a program is played immediately (less than one second) after it is selected, noise may appear in the output sound.

Data dump compatibility

The **bank M** programs created using MOSS are not compatible with the Prophecy or Z1.

Please use an insertion effect with the program

In all modes (Program, Combination, Sequencer), be sure to use an insertion effect when using a **bank M** program. If you do not use an insertion effect, the output of the **bank M** program will diminish.

When MIDI Clock Source is set to Internal

If a bank M program is selected for any timbre in a combination, the D-mod Src "Tempo" for the AMS or effect of the timbre program will use the Prog. Tempo setting (☞page 61 of this manual).

SOLO-TRI convert sounds (SOLO_TRI.PCG)

The SOLO_TRI.PCG sounds in the included disk are data which was created to allow the SOLO-TRI preset sounds (☞page 14 of this manual) to be simulated on the MOSS-TRI. For some sounds, the audible result may not be precisely identical.

Additional message

Bank S was skipped

   Situation: Bank S data was skipped while loading data. **Bank S** programs cannot be used.