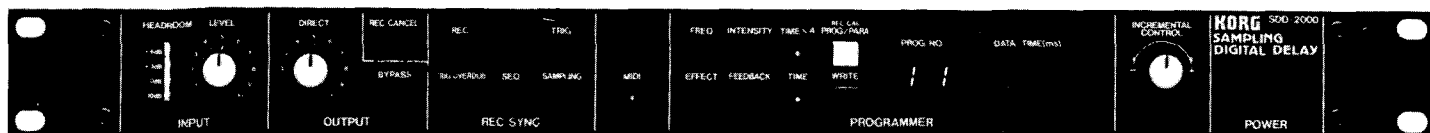# SDD-2000

## SAMPLING
## DIGITAL
## DELAY

### OWNER'S MANUAL

# KORG®

# SDD-2000

**The SDD-2000 is a new kind of digital delay that is designed to work**

**1** Used as a conventional delay machine, the SDD-2000 can provide very long delay times of up to 4368ms. Up to 64 effects such as chorus, flanging, doubling, and echo can be programmed for rapid access. MIDI program change data can be used to select stored effects.

**2** In the trigger overdub mode, a foot switch, drum machine trigger signal, MIDI timing clock, or other signal can be used to set the delay time, making it easy to match the tempo of the music.

**3** The sequencer and sampling modes allow audio inputs of up to 4368ms to be recorded and then reproduced when desired. Coupled with a MIDI keyboard (or other MIDI control device) the sampled sound can be "played" (like on a sampling keyboard instrument).
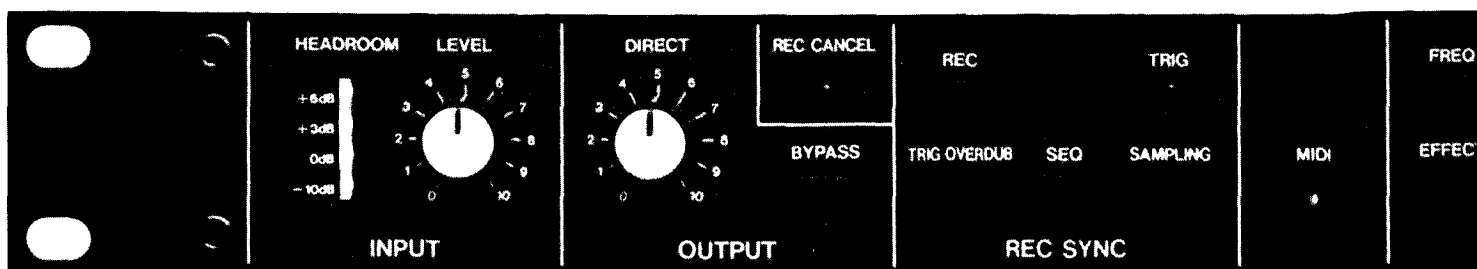
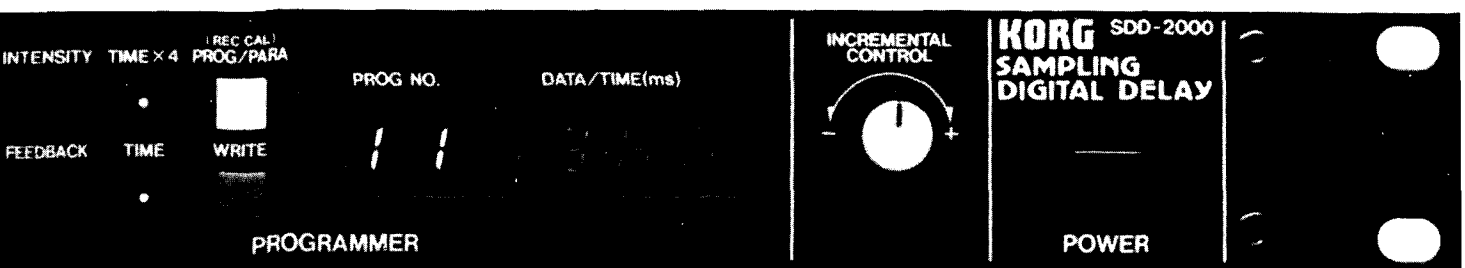*Congratulations and thank you for purchasing the Korg SDD-2000. For optimum performance, long term reliability and safety, please read this manual before use.*

## with MIDI data, thereby offering new and exciting capabilities.

**4** Rec cancel, program up, and other practical functions add to the value of this unit for live performance.

**5** Three outputs — DIRECT, + MIX, — MIX — offer variety of stereo reproductiion possibilities.

**6** Incremental control of all parameters and a 6-column display add to operational convenience.

INTENSITY  TIME × 4  ⌐REC CAL⌐ PROG/PARA

PROG NO.  DATA/TIME(ms)  INCREMENTAL CONTROL  **KORG** SDD-2000 SAMPLING DIGITAL DELAY

FEEDBACK  TIME  WRITE

PROGRAMMER  POWER

# IMPORTANT SAFETY PRECAUTIONS

Please read and observe the following precautions to assure reliability and safety.

## LOCATION

To avoid malfunction do not use this unit in the following locations for long periods of time:
- In direct sunlight.
- Exposed to extremes of temperature or humidity.
- In sandy or dusty places.

## POWER SUPPLY

- Use only with rated AC voltage. If you will be using this unit in a country having a different voltage, be sure to obtain the proper transformer to convert to rated voltage.
- To help prevent noise and degraded sound quality, avoid using the same outlet as other equipment or branching off extension cords shared by other equipment.

## HANDLE GENTLY

Knobs and switches are designed to provide positive operation with a light touch. Excessive force may cause damage.

## MAINTENANCE

Wipe the exterior with a soft, dry cloth. Never use paint thinner, benzene or other solvents.

## PREVENTING ELECTRICAL INTERFERENCE

Erratic performance may be caused by electrical interference from nearby appliances (radio, TV, etc.), especially those with motors. Avoid operating this unit near possible sources of interference.

## KEEP THIS MANUAL

Store this manual in a safe place of future reference.

# CONTENTS

# FEATURES & FUNCTIONS
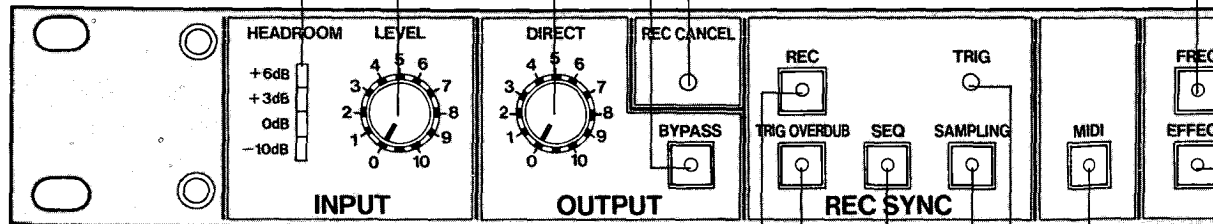
# 1 FRONT PANEL

## INPUT SECTION

2 Input LEVEL Control
1 HEADROOM Indicator

## OUTPUT SECTION

3 DIRECT Volume Control
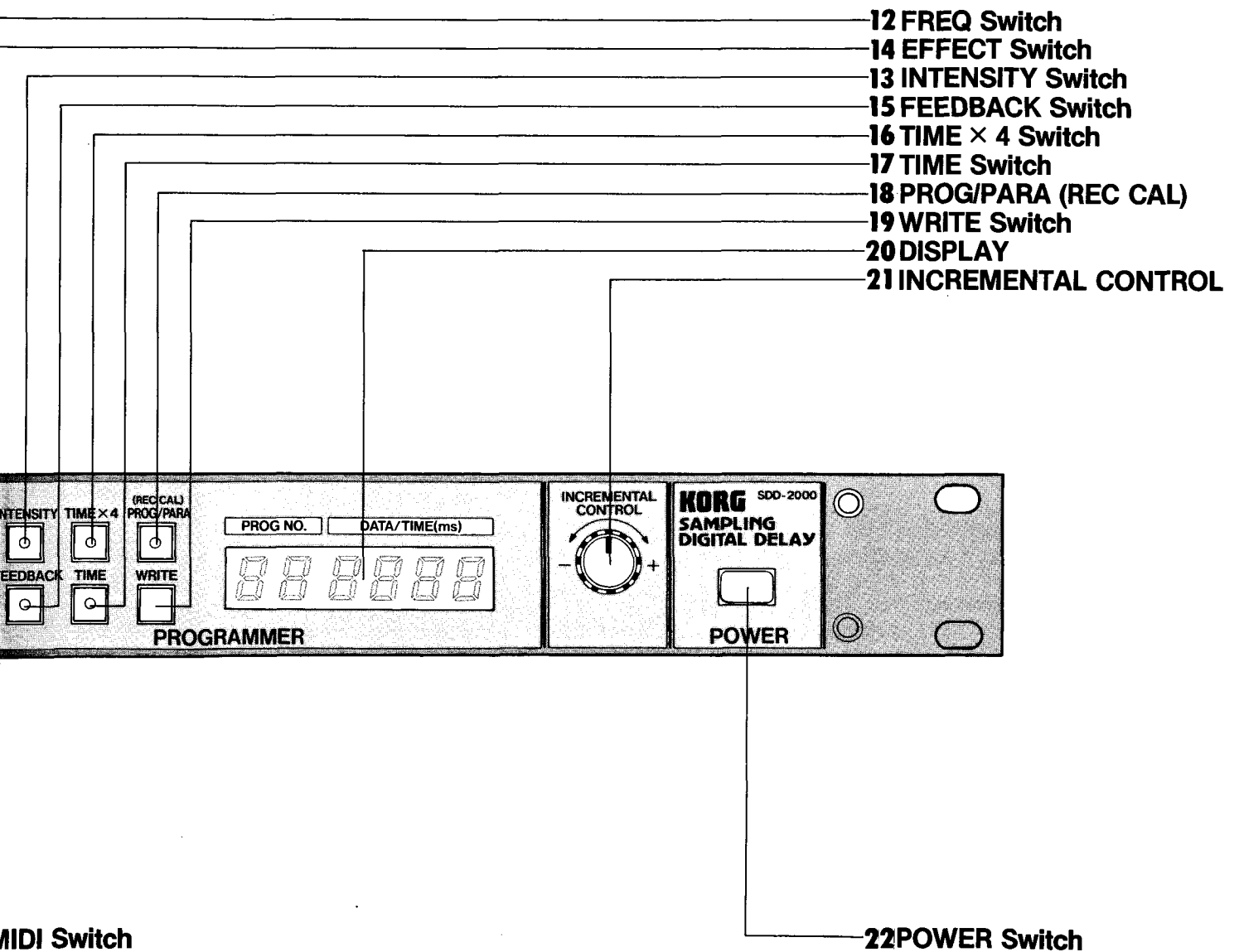4 BYPASS Switch
5 REC CANCEL LED

HEADROOM    LEVEL          DIRECT      REC CANCEL        REC              TRIG              FREC

+6dB    4  5  6        4  5  6                                                             
+3dB   3       7      3       7                                                      EFFEC
0dB   2         8    2         8      BYPASS   TRIG OVERDUB  SEQ  SAMPLING   MIDI
−10dB  1         9    1         9
        0    10        0    10

INPUT              OUTPUT              REC SYNC

## REC SYNC SECTION

6 REC Switch
7 TRIG OVERDUB Switch
8 SEQ Switch
9 SAMPLING Switch
10 TRIG LED

**12** FREQ Switch
**14** EFFECT Switch
**13** INTENSITY Switch
**15** FEEDBACK Switch
**16** TIME × 4 Switch
**17** TIME Switch
**18** PROG/PARA (REC CAL)
**19** WRITE Switch
**20** DISPLAY
**21** INCREMENTAL CONTROL

INTENSITY TIME×4 (REC CAL) PROG/PARA

PROG NO. DATA/TIME(ms)

INCREMENTAL CONTROL

**KORG** SDD-2000
SAMPLING
DIGITAL DELAY

− +

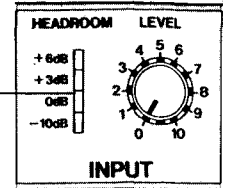FEEDBACK TIME WRITE

PROGRAMMER

POWER

MIDI Switch

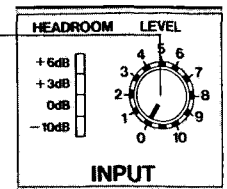**22** POWER Switch

# INPUT SECTION

## 1 HEADROOM Indicator

This LED meter shows input signal level. However, nothing is indicated during the 9-second muting period after power is turned on or during bypass operation.
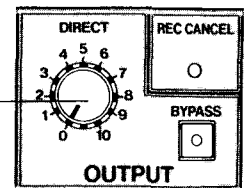
## 2 Input LEVEL Control

Used to adjust input signal level.

# OUTPUT SECTION

## 3 DIRECT Volume Control

This controls the volume of the direct sound in the + MIX and − MIX outputs on the rear panel.

## 4 BYPASS Switch

When this switch is on, only the direct sound is sent to the outputs. During bypass operation the DIRECT volume control setting has no effect; the input signal is sent to the output jacks without any change. Bypass operation is indicated by an LED. Press this switch again to return to the previous effect.
This switch cannot be used during recording in the sequencer and sampling modes.
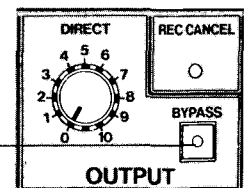
# REC CANCEL

## 5 REC CANCEL LED

This LED illuminates during REC CANCEL operation. For details, see the explanation for the rear panel REC CANCEL jack.
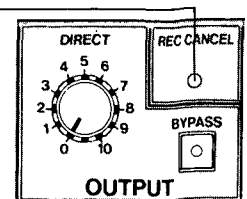
# REC SYNC SECTION

**6 REC Switch**

In the sampling and sequencer modes this is used as the recording switch. In the trigger overdub mode it is used to manually set the delay time.

**7 TRIG OVERDUB Switch**

This switch is used to select the trigger overdub mode with automatic setting of delay time.

**8 SEQ Switch**

This selects the sequencer mode for recording and repeated playback of phrases of up to 4368ms.

**9 SAMPLING Switch**

This selects the sampling mode which allows recording of audio signal inputs and reproduction of the sampled signal when triggered by a foot switch or other signal source.

**10 TRIG LED**

This illuminates when a trigger signal is input to the rear panel trigger jack during trigger overdub, sampling mode operation.

# MIDI

**11 MIDI Switch**

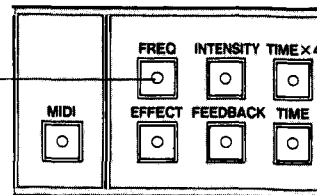When this switch is on, its LED lights up and the SDD-2000 can receive MIDI data.
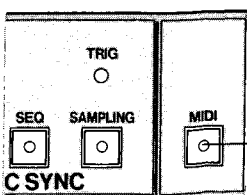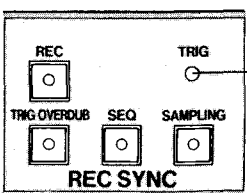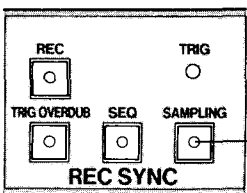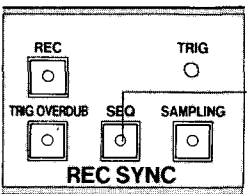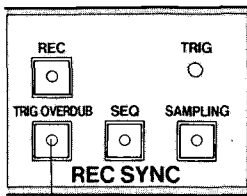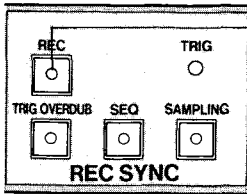
# PROGRAMMER SECTION

## 12 FREQ Switch

This selects display of the modulation frequency (speed) value and allows adjustment using the incremental control knob.

| Displayed Value | Modulation Speed |
|---|---|
| *0* | Slow |
| ↕ | ↕ |
| *31* | Fast |

## 13 INTENSITY Switch

This selects display of the modulation intensity (depth) value and allows adjustment using the incremental control knob.

| Displayed Value | Modulatiion Depth |
|---|---|
| *0* | Shallow |
| ↕ | ↕ |
| *31* | Deep |

---
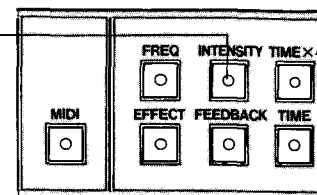
* **About Modulation**
  Effects such as chorus, vibrato, and flanging are produced by using the internal LFO (low frequency oscillator) to vary (modulate) the delay time.

---

## 14 EFECT Switch

This selects display of the volume level of the delayed signal (or the sampled signal to be reproduced) and allows adjustment using the incremental control knob.

| Displayed Value | Effect Signal Volume |
|---|---|
| *0* | No effect sound |
| ↕ | ↕ |
| *31* | Maximum |
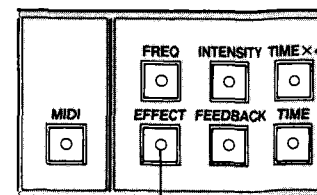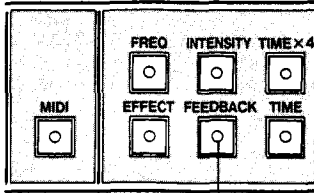
## 15 FEEDBACK Switch

Selects display of the amount of feedback and its phase. This also allows adjustment of the feedback value using the incremental control knob.

| Displayed Value | Feed Back Level |
|---|---|
| -3 ! | Maximum inverted (cause oscillation) |
| ↕ | ↕ |
| 0 | No feedback |
| ↕ | |
| 3 ! | Maximum positive (causes oscillation) |

---

* **About Feedback**
  Feedback or "regeneration" is a matter of taking part of the signal coming out of the delay line and feeding it back into the input to be processed again. The amount of feedback and its phase help establish the effect produced. With long delay times, feedback level simply determines the number of repeats or echoes. In flanging and other short delay effects, the feedback level and phase affect the tone color of the sound.
  Runaway oscillation will occur if the feedback level is set too high.

---
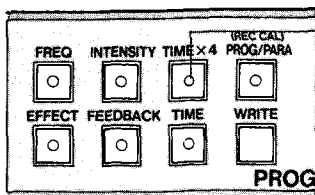
## 16 TIME × 4 Switch

This selects the "×4" mode which allows delay (or recording/sampling) times of up to 4368ms. When this is off, the maximum delay time is 1092ms.
An LED lights up to indicate 4 mode.
The ×1 mode (the normal mode when ×4 is not selected) has superior high frequency response.
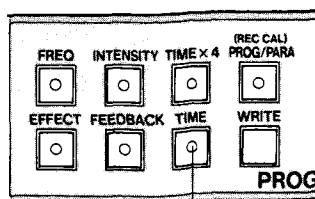
## 17 TIME Switch

This is used to enable setting of the delay (or recording/sampling) time. In the ×1 mode, the display shows times of from 0. 0 to 1092ms; in the ×4 mode it shows from 0 to 4368ms.
At settings of up to 10ms in the ×1 mode the display gives fractional indications to the first decimal place.

## 18 PROG/PARA (REC CAL)

In the delay mode, this switches between allowing "program change" and allowing editing of individual parameters. In the sequencer and sampling modes it allows "recording calibration." (For details, see the section on the REC CAL function.)
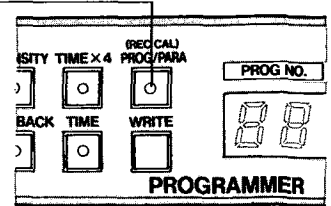
## 19 WRITE Switch

This is used to store programs in memory. For details see the section on "Writing a Program."
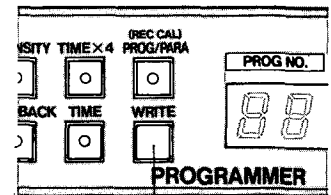
## 20 DISPLAY

Shows the program number and the values of particular parameters.
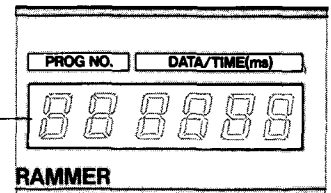
## 21 INCREMENTAL CONTROL

This is used to adjust, set or select parameters, program numbers, MIDI channels, and so on.
When used to set the delay time, this controller is sensitive to how fast you turn the knob. It is designed to change one step at a time when turned slowly, and change in larger amounts when turned rapidly.
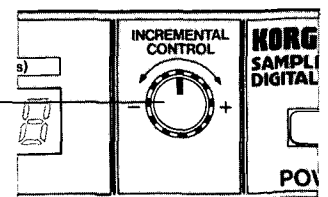
# POWER
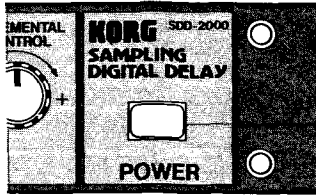
### 22 POWER Switch

This unit takes about nine seconds to initialize itself after the power is turned on. All functions are inoperative during this muting time.

# 2 REAR PANEL/CONNECTIONS

## CONTROL SECTION

6 BYPASS jack
7 REC CANCEL jack
8 PROGRAM UP jack
9 REC jack
10 TRIGGER jack
11 TUNE Control
12 MIDI IN jack
13 MIDI THRU jack

MIDI THRU     MIDI IN     TUNE
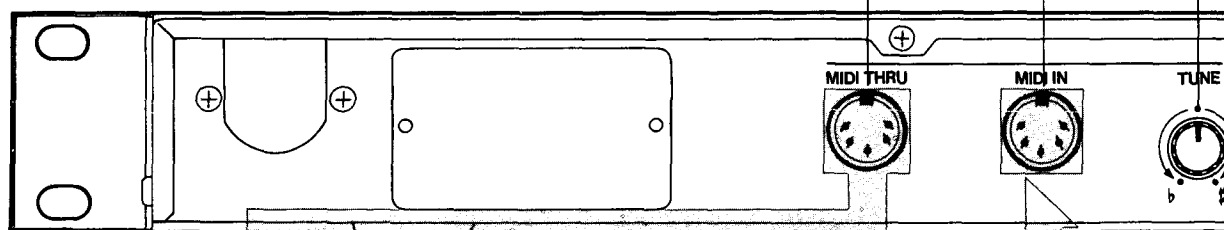
To other MIDI equipment.

From MIDI keyboard, sequencer, drum machine, or computer.

From Drum Machine (DDM-110/220, KPR-77, etc.) or foot switch (PS-1 etc.)

3 DIRECT Output
4 + MIX Output
5 – MIX Output

2 ATTENUATOR
1 INPUT jack

ONTROL

| TRIG | REC | PROG UP | REC CANCEL | BYPASS | DIRECT | + MIX | – MIX | –35dB | –10dB |
| GND | GND | GND | GND | GND | | | | | |

OUTPUT — — INPUT —

(GAIN : UNITY)

From foot switch
(PS-1, S-2, etc.)

To amplifier(s)
or mixing console
(MM-25, KMX-8, etc.)

From electric guitar,
bass, microphone,
keyboard, mixing
console, etc.
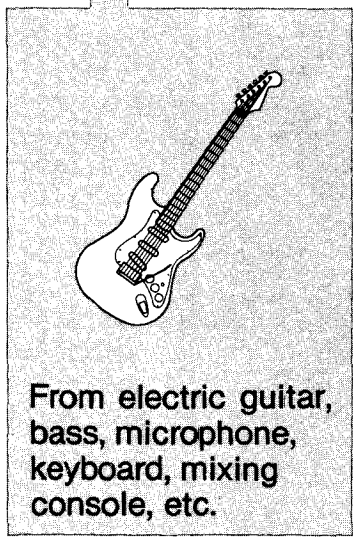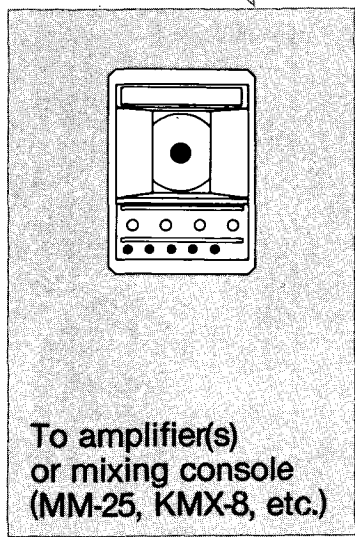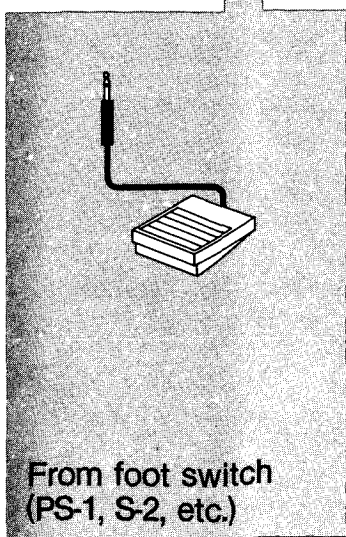
# INPUT/OUTPUT SECTION

## This section has jacks for the audio input signal and output signals.

### 1 INPUT Jack

For signal from electric guitar, bass, microphone, keyboard, etc.
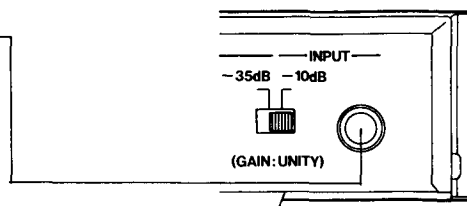
### 2 ATTENUATOR

Set this switch to the position suitable for the type of input signal used.

---
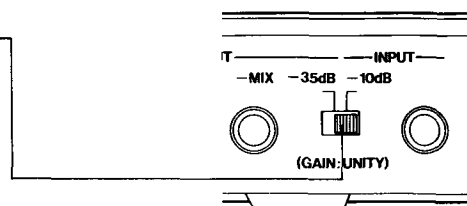
**\*Input Level Adjustment**

● If the input level is too high it will cause distortion. If it is too low, it will reduce the signal-to-noise ratio. Adjust input level so that the HEAD-ROOM indicator +6dB LED lights occasionally on maximum signal peaks.

● Remember to check and readjust input level after changing feedback level. This is necessary because the amount of feedback will change the signal level within the circuitry.

● Set the ATTENUATOR to the correct position for the signal source before adjusting input level.

---

| Switch | Input Signal Source |
|--------|---------------------|
| −10dB | From synthesizer, drum machine, other electronic instrument, mixing console, or audio system |
| −35dB | From electric guitar, bass, electric piano, microphone, or other low level signal source. |

### 3 DIRECT Output

This provides the direct sound (the input sound) only.
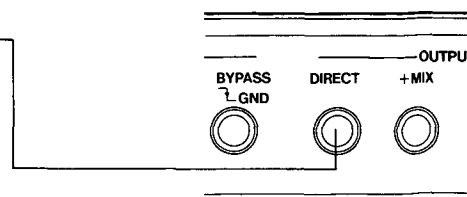
### 4 +MIX Output

This provides a mixed output of the direct and effect (or recorded/sampled) sounds. Balance is determined by the front panel DIRECT volume control setting and the PROGRAMMER section EFFECT setting.

```
──OUTPUT────────────INP|
+MIX       ─MIX  ─35dB  ─10dB
   ◯         ◯      ▓
              (GAIN:UNITY)
```
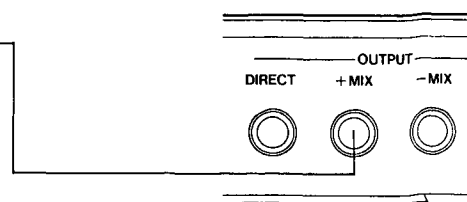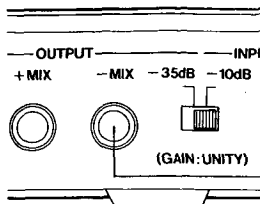
## 5 – MIX Output

This provides an out of phase mix of the direct and effect sounds. Balance is determined in the same way as for the + MIX output.

---

* **About Input/Output Level**
  Input and output level are at unity (one to one) in the SDD-2000. Output level is the same as input level.

* **Using the Outputs**
  The three output jacks can be connected in several ways to create stereo-like effects.

  Example: 1.
  Connect the DIRECT and + MIX outputs to separate amplifiers or separate mixing console channels and pan them to opposite sides. Set the front panel DIRECT volume control to "0" (so that only the effect sound appears in the + MIX output). With short delay times this gives a rich stereo-like sound. With long delay times the sound appears to shift from one side to the other.
  Example: 2
  Use + MIX and – MIX connected to separate amplifiers or separate mixing console channels and pan them to opposite sides. The out-of-phase effect component of the – MIX output creates a very spacious sound. Especially good for chorus, flanging, and similar effects.

---

# CONTROL SECTION

The jacks in this section are used with foot switches, drum machines, MIDI signals, and so on for control of various SDD-2000 functions.

```
REC
CANCEL  BYPASS   DIRECT
⅃GND    ⅃GND
  ◯       ◯       ◯
```
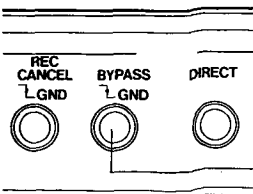
## 6 BYPASS Jack

For foot switch control of the BYPASS function. Used the same way as the front panel BYPASS switch.

## 7 REC CANCEL Jack

When a foot switch that is connected to this jack is depressed, the SDD-2000 switches to the REC CANCEL mode. This leaves the effect sound that is present at the instant the foot switch is depressed and switches the input signal to bypass the delay circuitry. While REC CANCEL is on, the front panel REC CANCEL LED illuminates.
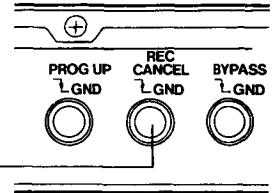
## 8 PROGRAM UP Jack

The selected program number is advanced each time a foot switch connected to this jack is depressed (in the delay mode).
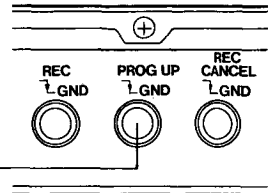
## 9 REC Jack

For foot switch operation with the same function as the front panel REC switch. (Used for modes other than the delay mode.)
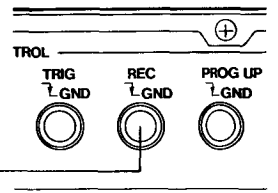
## 10 TRIGGER Jack

For a trigger signal input from a drum machine or foot switch.
This triggers playback of sampled sounds (in the sampling mode) or sets the delay time (in the trigger overdub mode).
The front panel TRIG LED illuminates every time a trigger signal is received.

---
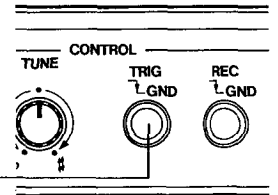
* **Foot Switches to be Used with Control Jacks**
Foot switches to be used with these control jacks should be the type that is on during the period the foot switch is depressed. Such foot switches include the Korg PS-1 and S-2.

---

## 11 TUNE Control

This lets you adjust the pitch of the reproduced sound by up to ±50 cents in the sampling and sequencer modes.
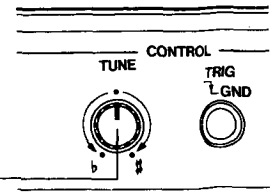
## 12 MIDI IN Jack

This jack is for reception of MIDI data from a MIDI keyboard, sequencer, drum machine, or computer.
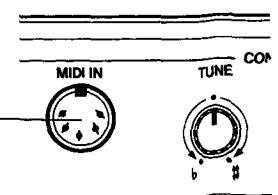
**13 MIDI THRU Jack**

This provides the MIDI signal received at the MIDI IN jack unchanged.

This chart shows which kinds of MIDI data can be received by the SDD-2000 when the front panel MIDI switch is on. MIDI equipped keyboards, sequencers, drum machines, and computers can be connected to the SDD-2000.

| DATA \ MODE | DELAY | TRIGGER OVERDUB | SEQUENCER | SAMPLING |
|---|:---:|:---:|:---:|:---:|
| PROGRAM CHANGE | ○ | × | × | × |
| TIMING CLOCK | × | ○ | × | × |
| NOTE ON/OFF (WITH VELOCITY) | × | × | ○ | ○ |
| PITCH BEND | × | × | ○ | ○ |
| MODULATION (CONTROL CHANGE NO.1) | × | × | ○ | ○ |
| OMNI ON/OFF | ○ | ○ | ○ | ○ |
| ALL NOTES OFF | × | × | ○ | ○ |
| SYSTEM EXCLUSIVE | ○ | × | × | × |
| ACTIVE SENSING | × | × | ○ | ○ |

> **NOTE:**
> Modulation data is used to modulate sound recorded using the SEQUENCER or SAMPLING mode. If the sent data value is higher than the intensity parameter value for a mode, then modulation can be applied at higher than the set value. In this case, modulation depth is smaller when compared with those of the delay sound generated with the DELAY or TRIGGER OVERDUB mode.
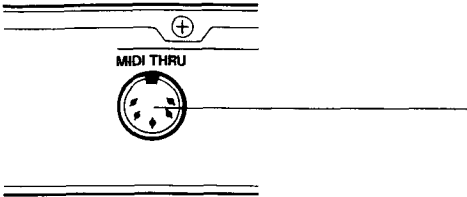
# 3 RACK MOUNTING PROCEDURE

## 19″ RACK MOUNTING PROCEDURE
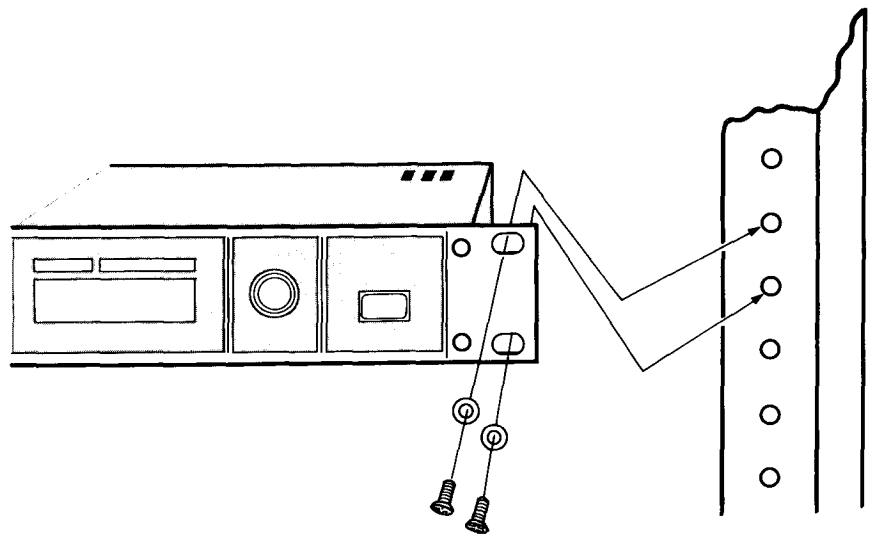
Attach using supplied screws.
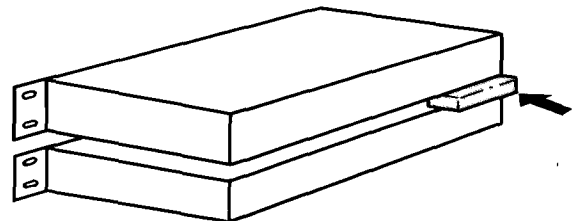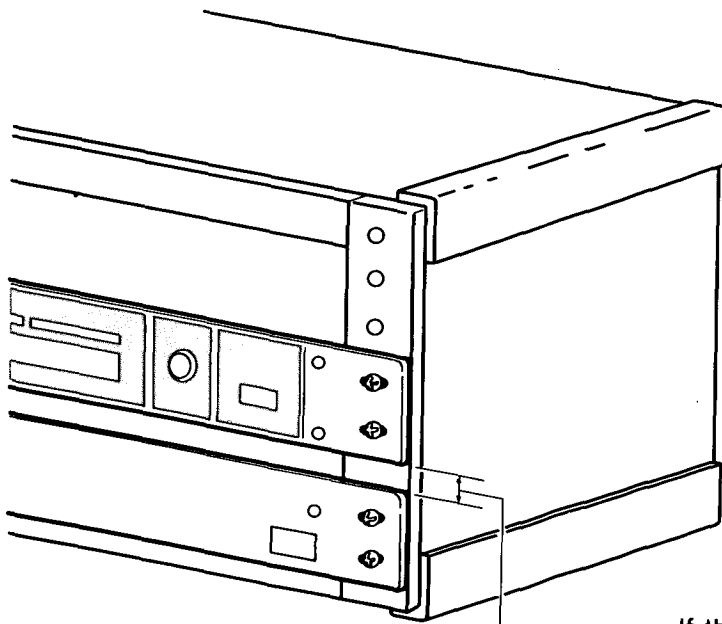
If there is a gap of around 3mm or more here, fill the rear area with something to keep the unit from sagging.

Up to 64 effects such as various short delays,
long delays, chorus, flanging, and other groups of settings
can be stored in memory and recalled as desired.
These "programs" can also be edited
and assigned different program numbers.

# 1. BASIC SETTINGS

1. Turn off the power on the SDD-2000 and all amplifiers, keyboards, and other equipment to be connected. Then make connections referring to the chart in the Rear Panel/Connections section of this manual.

2. After completing connections turn on power on the SDD-2000 and other equipment.
   After an initial muting period of about 9 seconds the SDD-2000 will be ready to use.
   Adjust input level so that the +6dB LED on the HEADROOM display lights up only occassionally on input signal peaks.
   Use the DIRECT volume control to adjust the amount of direct signal in the MIX outputs.

# 2. OPERATION

■ **Program Change**
Effect programs can be selected in several ways, as described below.

**A. Incremental Controller Method**
Press the PROG/PARA switch (in the PROGRAMMER section) so that the LED illuminates. Then use the INCREMENTAL CONTROL knob to change the program number.

Selected program
number shown here.

Turn to change number.
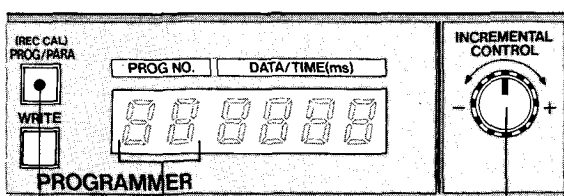
Press so LED lights.

# DIGITAL DELAY MODE

## B. Foot Switch Method

Before turning on the power, connect a foot switch to the rear panel PROG UP Jack.

The program number will advance by one each time the foot switch is depressed. (This is effective regardless of the position of the PROG/PARA switch.)



Korg PS-1
foot switch, etc.
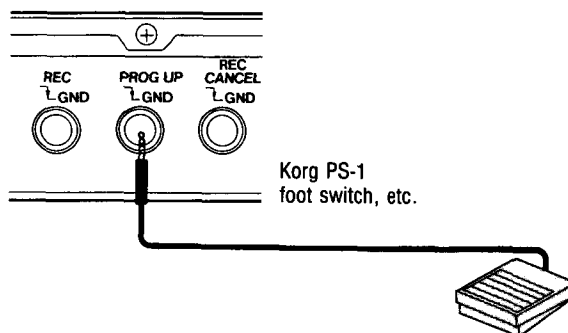
## C. MIDI Data Method

Before turning on the power, connect a MIDI keyboard or other MIDI control device. Connect the external MIDI unit's MIDI OUT jack to the SDD-2000's MIDI IN jack.



From MIDI OUT jack
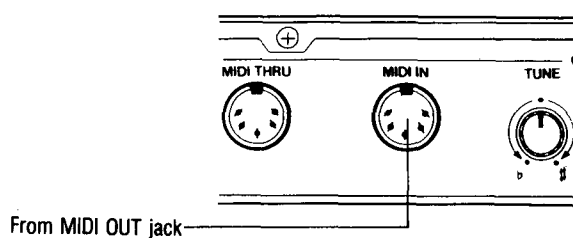
[1] Turn on MIDI switch on SDD-2000 (so the LED illuminates).

[2] Select the MIDI receive channel by the method described below. The selected channel must match the channel(s) to which the connected keyboard (or other unit) can send. Then a change in the program number on the keyboard will cause a change in the program number on the SDD-2000.
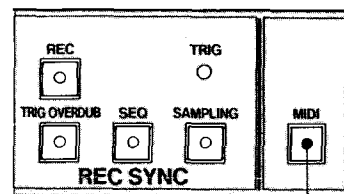


This LED on.

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### *SETTING THE MIDI RECEIVE CHANNEL

[1] While pressing on the MIDI switch, slowly turn the INCREMENTAL CONTROL knob one step. The display will then show the previously selected MIDI receive channel number.

● When the power is turned on the SDD-2000 is initially in the OMNI mode. But it switches to OMNI OFF as soon as this procedure is performed.

[2] If the displayed channel number is not what you want, turn the INCREMENTAL CONTROL knob to select your desired MIDI channel.

[3] Release the MIDI switch.
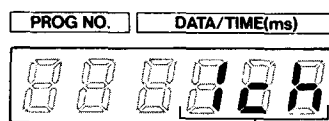


Shows MIDI receive channel number.
(Example here indicates channel 1.)

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● The selected program number is maintained when the power is turned off. The displayed program number is the most recently selected program number.

**2 Editing**

Program contents can be edited by the following method.

1 Press the PROG/PARA switch so that the LED goes out.

2 Press the switch for the parameter that you want to change.

● When you press one of the parameter switches (such as FREQ, INTENSITY, EFFECT, FEEDBACK, TIME) its LED will illuminate and the value of that parameter will be shown on the display.
Use the INCREMENTAL CONTROL knob to adjust the value of the selected parameter.

● The time mode switches back and forth between ×4 and ×1 each time the TIME × 4 switch is pressed.

● A dot at the left side of the data display lights up when a value has been changed. The dot goes out if you return to the previously stored value.
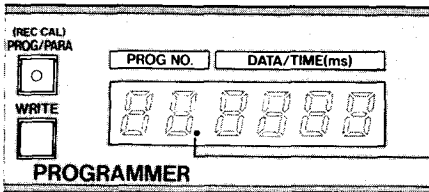

—This dot lights up.

NOTE:
* The edit will be cancelled if you change to a different program number and then return to the edited program number.

* Programs remain as edited if the power is turned off and then turned on again.

# ____3. PROGRAM WRITE PROCEDURE
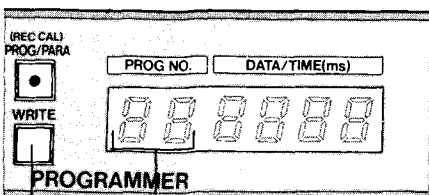

Flashing
Press WRITE switch.

1 Select a program that is similar to the effect that you want to create.

2 Edit to obtain the desired effect.

3 Press the WRITE switch. The displayed program number will flash on and off.

4 Select the program number under which you wish to save your effect. The program number can be selected by the INCREMENTAL CONTROL knob, by a PROG UP foot switch, or by MIDI program change data.

5 Press the WRITE switch again to complete the program write procedure.

# TRIGGER OVERDUB MODE

This mode uses a foot switch or drum machine trigger signal (or front panel REC switch) or a MIDI timing clock signal to set the delay time.
This makes it easy to match delay time and song tempo.

# A SETTING BY REC SWITCH OR FOOT SWITCH

# 1. BASIC SETTING

[1] Turn off SDD-2000 and all equipment to be connected. Make connections referring to the Rear Panel/Connections section of this manual.

> **NOTE:**
> In this case, do not plug anything into the TRIG jack. If anything is plugged into the TRIG jack then the front panel REC switch can not be used to set the delay time. (The TRIG jack is used when a drum machine is used to determine the delay time, as described later.)

[2] Turn on power after completing connections. The SDD-2000 is now in the delay mode. Adjust input level.

# 2. DELAY TIME SETTING

[1] Press the TRIG OVERDUB switch so that its LED is on. This changes the SDD-2000 from the delay mode to the trigger overdub mode.

At this point, parameter values set in the delay mode are carried over unchanged into the trigger overdub mode.

Flashing ──────

This LED on.──────

[2] The Display appears as shown here.

The time mode switches back and forth between × 1 and × 4 each time the TIME × 4 switch is pressed. The ×4 mode enables delay time of up to 4368ms. Maximum delay time in the ×1 mode is 1092ms.

Flashing

Indicates time mode (×4 mode shown here)

Indicates that delay time can now be set.

REC      TRIG

TRIG OVERDUB   SEQ   SAMPLING

**REC SYNC**

Press REC switch
(or foot switch)

PROG NO. | DATA/TIME(ms)
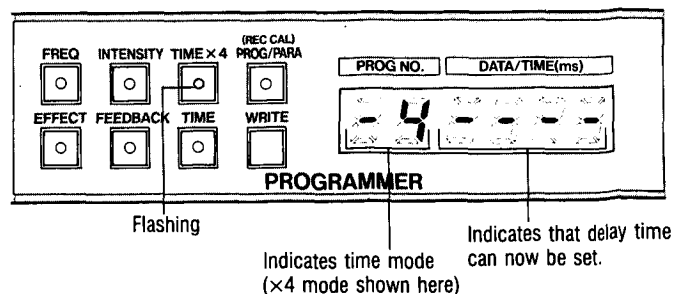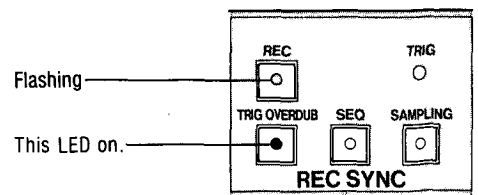
This counts up as
the delay time is measured.

3 Press the REC switch (or foot switch) to begin measurement of the delay time.

4 Now press the REC switch (or foot switch) a second time. Your delay time is now the time measured between the two times that you pressed the switch. However, if the elapsed time reaches the maximum, then the display stops there. The maximum is 1092ms in the ×1 mode and 4368ms in the ×4 mode.
This method of setting the delay time makes it easy to match the tempo of the music.
You can now continue performing using the delay time just set.

# 3. OPERATION AFTER SETTING DELAY TIME

FREQ   INTENSITY   TIME×4   (REC CAL) PROG/PARA

PROG NO. | DATA/TIME(ms)

EFFECT   FEEDBACK   TIME   WRITE

**PROGRAMMER**
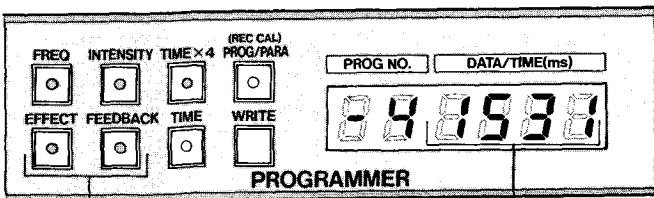
Shows delay time setting.

Parameter values can be changed while pressing these switches.

DATA/TIME(ms)

INCREMENTAL CONTROL

Turn to adjust parameter value (while keeping parameter switch depressed)

● **Editing Parameters**
After setting the delay time, you can edit the various parameters whose switch LEDs are flashing (REC, INTENSITY, EFFECT, FEEDBACK). To edit a parameter, depress its switch and at the same time turn the INCREMENTAL CONTROL knob.

● **To return to the time mode**
Press the TIME ×4 switch to return to the time mode. This takes you back to step 2.

● **To reset the delay time**
Press the REC switch. This begins measurement of time, as in step 3.

● **To return to delay mode from trigger overdub mode.**
Press the TRIG OVERDUB switch so that is LED goes out.
This returns you to the delay mode. The delay time and time mode (×1 or ×4) values set in the trigger overdub mode are retained.
Other parameter values are those of the delay mode.
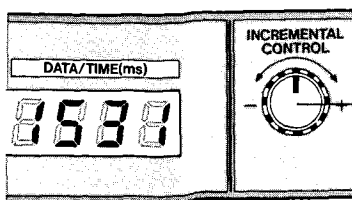
# B SETTING BY DRUM MACHINE TRIGGER SIGNAL

# 1. BASIC SETTING

[1] Turn off power on SDD-2000 and equipment to be connected.

[2] Connect drum machine's trigger out jack to SDD-2000's TRIG input jack. Refer to Rear Panel/Connections section of this manual for details about other connections.

[3] Turn on power after completing all connections. The SDD-2000 is now in the delay mode. Adjust input level.
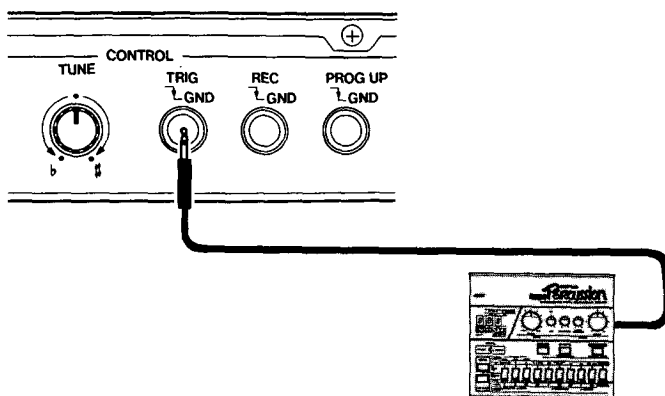
# 2. SETTING THE DELAY TIME

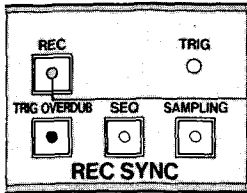[1] Change to the trigger overdub mode by pressing the TRIG OVERDUB switch so that its LED lights up.

At this point, parameter values set in the delay mode are carried over unchanged into the trigger overdub mode.

Flashing

This LED on.

[2] The Display appears as shown here.

The time mode switches back and forth between ×1 and ×4 each time the TIME × 4 switch is pressed. The ×4 mode enables delay times of up to 4368ms. Maximum delay time in the ×1 mode is 1092ms.

Flashing
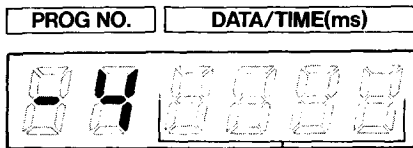Indicates time mode (×4 mode shown here). Indicates that delay time can now be set.
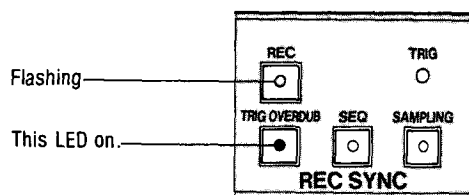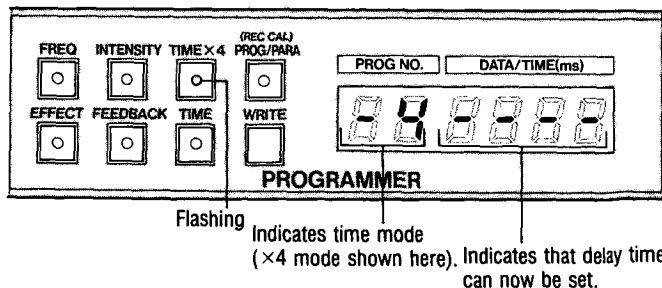
[3] Press the REC switch or foot switch. The display will appear as shown here.

Now start the drum machine. The TRIG LED will light up each time a trigger signal is received and the display will show the length of time from each trigger input to the next.
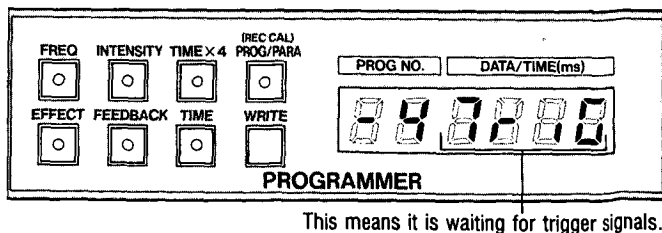
When the display does not change, press the REC or foot switch again to return to status [2], above. Then, confirm the connections with the drum machine.

This means it is waiting for trigger signals.

| PROG NO. | DATA/TIME(ms) |
|---|---|

```
-4 1591
```
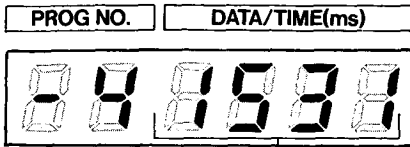
Delay time (measured time)

4 Press the REC switch or foot switch again. The delay time will then be set as the time between the last two trigger inputs.

The delay time setting will be shown on the display.

You can now continue performing using the new delay time.

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**NOTE:**
If the time between triggers exceeds the maximum (1092ms in ×1 mode or 4368ms in ×4 mode) then the display stops and the delay time is set as that maximum figure.

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# 3. OPERATION AFTER SETTING DELAY TIME
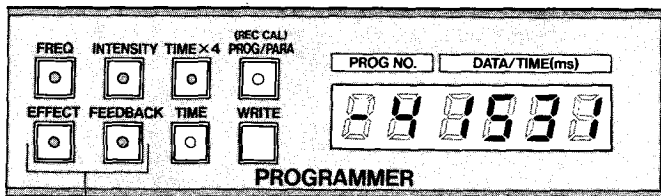
```
              (REC CAL)
FREQ  INTENSITY  TIME×4  PROG/PARA
 [⊙]    [⊙]      [⊙]     [○]      | PROG NO. | DATA/TIME(ms) |
EFFECT  FEEDBACK  TIME  WRITE
 [⊙]    [⊙]      [○]    [□]          -4 1591
              PROGRAMMER
```

Parameter values can be changed while pressing these switches.

● **Editing Parameters**
After setting the delay time, you can edit the various parameters whose switch LEDs are flashing (REC, INTENSITY, EFFECT, FEEDBACK). To edit a parameter, depress its switch and at the same time turn the INCREMENTAL CONTROL knob.
Parameter values can be changed while pressing these switches.
Shows delay time setting.
Turn to adjust parameter value (while keeping parameter switch depressed)

● **To return to the time mode**
Press the TIME ×4 switch to return to the time mode. This takes you back to step 2.

● **To reset the delay time**
Return to step 3.

● **To return to delay mode from trigger overdub mode.**
Press the TRIG OVERDUB switch so that is LED goes out.
This returns you to the delay mode. The delay time and time mode (×1 or ×4) values set in the trigger overdub mode are retained.
Other parameter values are those of the delay mode.

# C MIDI TIMING CLOCK SETTING

# 1. BASIC SETTING

1. Turn off power on SDD-2000 and equipment to be connected.

2. Use MIDI cable to connect sequencer (or other source of MIDI clock signal) MIDI OUT to SDD-2000 MIDI IN jack. Refer to section on Rear Panel/Connections for connections to other equipment.

This LED on.

3. Press SDD-2000 MIDI switch so that its LED is on.
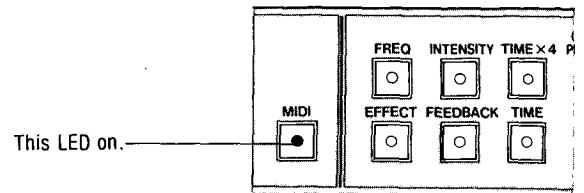
# 2. SETTING DELAY TIME

1. When power is turned on the SDD-2000 is initially in the delay mode. Press the TRIG OVERDUB switch to change to the trigger overdub mode.

   At this point, parameter values set in the delay mode are carried over unchanged into the trigger overdub mode.

Flashing

This LED on.
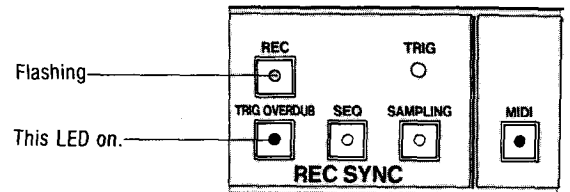
2. The time mode switches back and forth between ×1 and ×4 each time the TIME × 4 switch is pressed. The ×4 mode enables delay times of up to 4368ms. Maximum delay time in the ×1 mode is 1092ms. The INCREMENTAL CONTROL knob is used to select sync timing of 16, 8, 6, 4, or 2-beat.

   **Example:**
   The display here is for ×4 mode and 16-beat.

Flashing
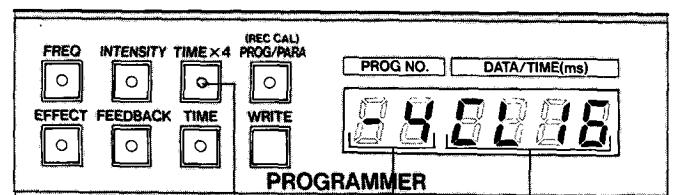
Indicates time mode (×4 mode shown here).

Shows sync beats (here it is 16-beat). A value of 2-16 selected by the INCREMENTAL CONTROL knob.

3. Press REC switch or foot switch.
   The display will appear as shown here.
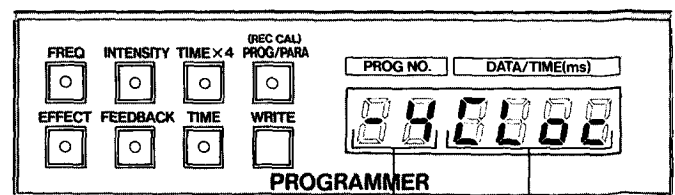
Waiting for MIDI clock signal ("CLoc")

Indicates time mode (×4 mode shown here)

4. Start sequencer or other MIDI control unit. The SDD-2000 starts measuring the delay time when it receives the first MIDI timing clock signal.

| PROG NO. | DATA/TIME(ms) |
|----------|---------------|
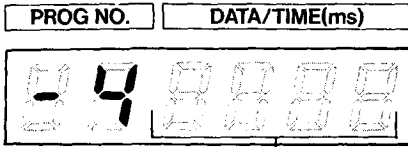


Counts up.

After the selected number of MIDI clock signals are received, the SDD-2000 sets the delay time and performance can continue. the delay time setting is shown on the display.

If the clock signal display does not change when the MIDI device is started, press the REC or foot switch to return to status ②, above. Then, confirm the connections with the MIDI device.

> **NOTE:**
> If the time it takes to receive the selected number of MIDI clock signals exceeds the maximum time of the time mode selected in step ②, then measurement will end, the display will show that (maximum) value, and it will be set as the delay time.

# 3. OPERATION AFTER SETTING DELAY TIME
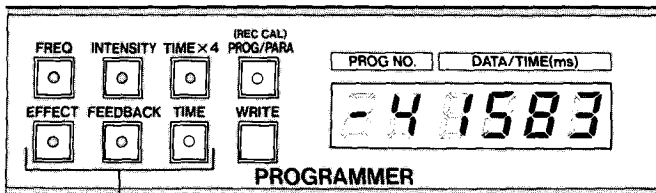


Parameter values can be changed while pressing these switches.

● **Editing Parameters**
After setting the delay time, you can edit the various parameters whose switch LEDs are flashing (REC, INTENSITY, EFFECT, FEEDBACK). To edit a parameter, depress its switch and at the same time turn the INCREMENTAL CONTROL knob.

● **To change the sync beat**
Turn the INCREMENTAL CONTROL knob a little (one step) so that the present beat value is shown on the display. If this is not what you want, turn the knob until your desired beat setting is displayed. The delay time will change to match the beat setting.

**Example:** 16-beat: 200ms ⟶ 8-beat: 400ms

● **To return to the time mode**
Press the TIME ×4 switch to return to the time mode. This takes you back to step 2.

● **To reset the delay time**
Return to step 3.

● **Returning to Delay Mode from Trigger Overdub Mode.**
Press the TRIG OVERDUB switch so that its LED goes out. This returns you to the delay mode. The delay time and time mode (×1 or ×4) values set in the trigger overdub mode are retained.
Other parameter values are those of the delay mode.

# SEQUENCER & SAMPLING MODES

The sequencer mode and sampling mode let you record audio inputs
(from guitar, tape, microphone, etc.) and then play them back.
The basic difference between the two modes is the way
in which the recorded sound is played back.
Each is suitable for particular purposes.
In both the sequencer and sampling modes,
a MIDI keyboard (or other MIDI equipped device
such as a computer or sequencer)
can be used to control the pitch of the reproduced sound.
This is a practical alternative to a "sampling keyboard."

# 1. SEQUENCER MODE

For repeated playback of recorded sounds (voice, harmony, melodic phrases, etc.) This is useful for repetitive string, wind instrument, and choral backing.

Beginning of recorded sound.                    End of recorded sound.

Plays the whole phrase over and over again.
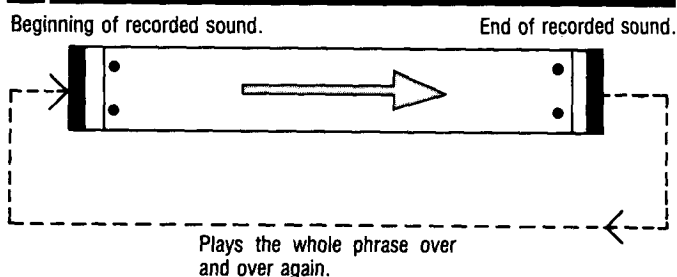
# 2. SAMPLING MODE

In this mode, the SDD-2000 plays the entire recorded section once each time it receives a trigger input or MIDI NOTE ON data. This can be particularly effective with sounds such as piano and percussion.

Beginning of recorded sound.                    End of recorded sound.

Plays whole recorded section once; does not repeat.
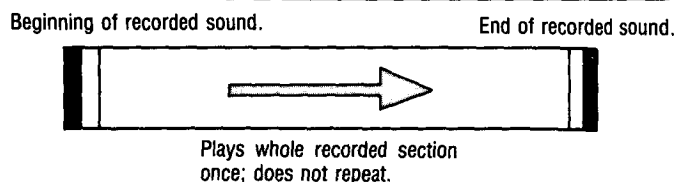
# A RECORDING/PLAYBACK WITH MIDI SWITCH OFF

## 1. BASIC SETTING
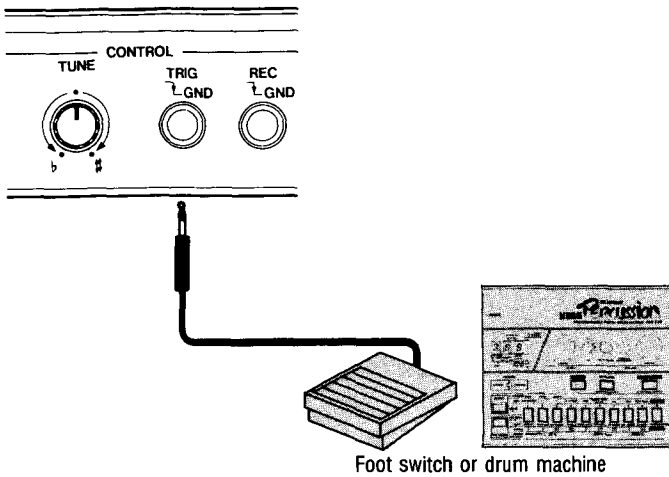
[1] Turn off SDD-2000 and all equipment to be connected. Make connections referring to the Rear Panel/Connections section of this manual.

● If you will be using the sampling mode, make connections from a drum machine trigger output or foot switch to the SDD-2000 rear panel TRIG input jack.

Foot switch or drum machine

[2] After completing connections, turn on the power on the SDD-2000 and other equipment (amp, keyboard, drum machine, etc.)

[3] Adjust input level so that the HEADROOM indicator +6dB LED illuminates occasionally on the highest signal peaks.

## 2. RECORDING/PLAYBACK PROCEDURE
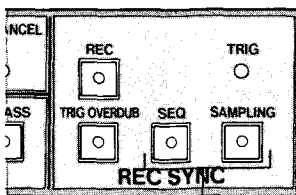
[1] Press the SEQ (sequencer) or SAMPLING switch to select the mode to be used.

● At this point, parameter values (frequency, intensity, effect) set in the delay mode are carried over unchanged into the selected sequencer or sampling mode.
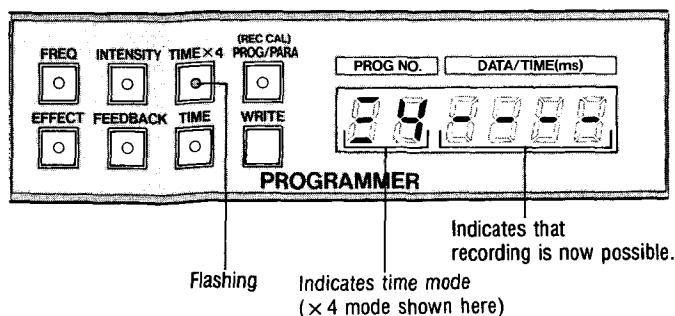
Press SEQ or SAMPLING switch.
LED lights on switch that is pressed.

[2] The display appears as shown here.

● The time mode switches back and forth between ×1 and ×4 each time the TIME × 4 switch is pressed. Select the time mode according to your requirements for high frequency response and length of recording time. The ×4 mode enables delay times of up to 4368ms. Maximum delay time in the ×1 mode is 1092ms, but high range response is better.

Indicates that recording is now possible.

Flashing    Indicates time mode
(×4 mode shown here)

③ Begin signal input. Recording will begin when input level reaches +3dB, as shown on the HEADROOM indicator. The display will appear as shown here.
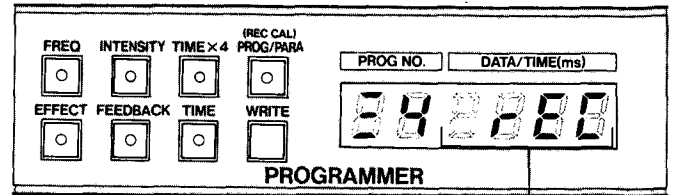


Display ("rEC") flashes during recording.

④ Press the REC switch (or foot switch connected to REC jack) when you want to end recording.

● If you don't press the REC switch or foot switch, then recording will end at the maximum time selected by the TIME × 4 switch.

Press REC switch.
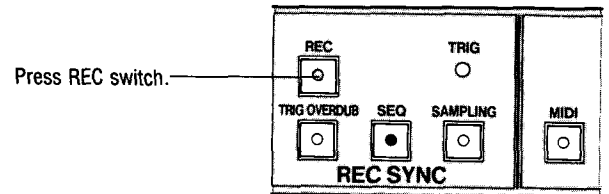


⑤ The recorded sound can now be played back. The display appears as shown here.

● In the sequencer mode, the recorded sound is automatically reproduced as soon as recording has been completed.

● In the sampling mode, the recorded sound is repeated once each time a trigger signal is received at the rear panel TRIG jack.

● To record again, press the REC switch. This will return you to step ②.
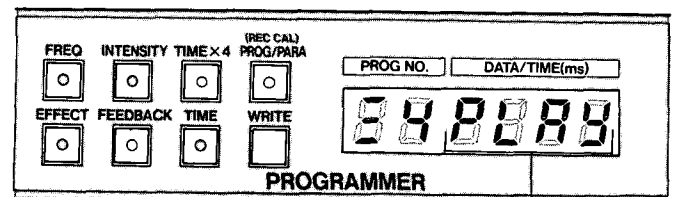


"PLAY" indication means that recorded sound can be reproduced.

# 3. OPERATION AFTER RECORDING (DURING PLAYBACK)
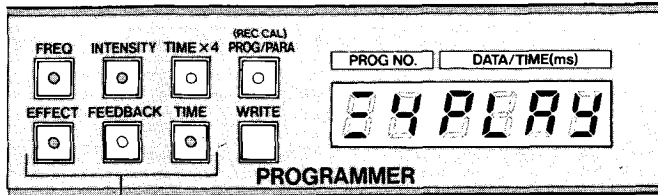


Frequency, intensity, effect,
and time LEDs are flashing.

● **Editing Parameters**
After setting the delay time, you can edit the various parameters whose switch LEDs are flashing.

Press the switch for the parameter that you wish to edit. While the switch is depressed, the display will show the present value for that parameter, and the value can be adjusted by turning the INCREMENTAL CONTROL knob.
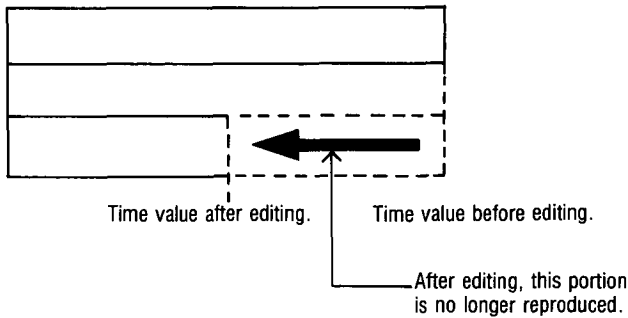


Time value after editing.    Time value before editing.

After editing, this portion
is no longer reproduced.

● **Editing the Time Parameter**
After a recording has been made, you can shorten the length of the recording by editing the TIME parameter. This shaves off the recording from the end. To reduce the length of a recording, hold down the TIME switch and turn the INCREMENTAL CONTROL knob.

* Note that recordings can only be made shorter; they can not be made longer than the original recording time.

NOTE:
In the sampling mode, sound will no longer be reproduced if you edit the time parameter so that the time value is reduced to around 120ms in the ×4 mode or 30ms in the ×1 mode.

● **To return to the delay mode:**
Press the presently selected mode switch (SEQ or SAMPLING) so that its LED goes out. This returns you to the delay mode.
Frequency, intensity, and effect parameter values are carried over into the delay mode.

# B RECORDING/PLAYBACK WITH MIDI SWITCH ON (FOR PITCH CONTROL)

## ABOUT MIDI OPERATION

A MIDI keyboard (or other MIDI device) can be used
with the SDD-2000 to control the pitch of the reproduced sound
in the sampling and sequencer modes.
This kind of recording and playback requires attention
to the following operations:

1. Supported note range setting.
2. Sampling note setting.
3. MIDI data processing setting.
4. REC CALIBRATION

Each of these is described below.
Actual recording and playback procedures are described afterward.

# 1. SUPPORTED NOTE RANGE SETTING

**▉ About supported note range.**
This depends on the time mode. A sound recorded in
the ×4 mode can be reproduced over a range of near-
ly three octaves. A sound recorded in the ×1 mode
can be reproduced over a range of nearly one octave.
This is feferred to as the supported note range.

Example with C as the lowest note:



In the ×4 mode

C◀—————————————————————▶B

In the ×1 mode

C◀———▶B

MIDI Keyboard



$C_0$   $C_1$   $C_2$   $C_3$   $C_4$   $C_5$   $C_6$   $B_6$

C0-B2 supported

In ×1 mode

Range of possible supported note range settings.

C4-B6 supported

$C_0$   $C_4$   $B_6$

C0-B0 supported

IN ×4 mode

C6-B6 supported

Range of possible supported note range settings.

$C_0$   $C_6$   $B_6$

## 2 Pitch of supported note range.

The pitch of the supported note range can be set in semitone steps within the range shown in the chart below.

● Refer to the instruction manual for the MIDI keyboard to determine its pitch range (MIDI note data range).

Example: Using the DW-6000 as the control keyboard with the SDD-2000 in the ×4 mode and the supported note range set at C2 through B4.



$C_1$   $B_1C_2$   $B_4C_5$   $C_6$

No sound from this section.

Sound reproduced by SDD-2000 when keys in this range are played.

No sound from this section.



REC   TRIG
TRIG OVERDUB   SEQ   SAMPLING   MIDI
REC SYNC

① Hold down MIDI switch

② Press sequencer switch while depressing MIDI switch.

| PROG NO. | DATA/TIME(ms) |



The actual supported note range will determine which part of the keyboard can be used to "play" the SDD-2000.

## 3 How to set the supported note range.

1 Hold down the MIDI switch and at the same time press the SEQ (sequencer) switch.
The display will flash, indicating the current supported note range. A dot after the note name indicates a sharp (#). "C.1" means C#, for example. This indicates the lowest note of the current supported note range. C#1 is indicated in this example.

2 Press the MIDI switch and the SEQ switch; at the same time turn the INCREMENTAL CONTROL knob to set the lowest note of your desired supported note range. In the ×4 mode the supported note range will extend three octaves above the selected note. In the ×1 mode it will extend one octave above the selected note.
When a MIDI keyboard is connected and the send and receive channels match, then you can play a note on the keyboard to set the supported note range. Play the lowest note of the supported note range that you desire.

- The supported note range setting is retained when the power is turned off.

> **NOTE:**
> Set the supported note range after selecting the time mode.

# 2. SAMPLING NOTE SETTING

The sampling note is a note that you choose within the supported note range. It is set according to the pitch range within which you want the recorded sound to be reproduced. (That is, how much lower or higher you want the reproduced sounds to be in relation to the pitch of the recorded sound. The sampling note can be set in semitone steps within the supported note range.

### ■ About the sampling note.

**Example:**
×4 mode with supported note setting as shown here.

1 Now, if we set B4 as the sampling note and then record a sound, the relationship between the keys played and the pitch of the reproduced sound will have the relationship shown here.



$C_1 \longleftarrow \qquad \qquad B_3$
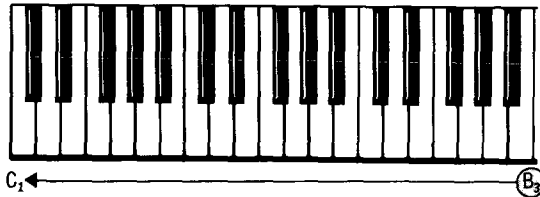
When the sampling note B3 is played, the reproduced sound will have the same pitch as the sound that was recorded. If keys lower than B3 are played, the reproduced sound will have a pitch lower than the original recorded sound.

2 If we set C1 as the sampling note and record a sound, the relationship between the keys played and the pitch of the reproduced sound will have the relationship shown here.



$C_1 \longrightarrow \qquad \qquad B_3$
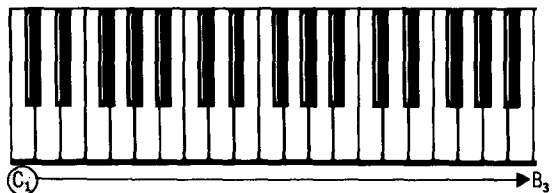
When the sampling note C1 is played, the reproduced sound will have the same pitch as the sound that was recorded. If keys higher than C1 are played then the reproduced sound will have a pitch higher than the original recorded sound.

3 If we set C2 as the sampling note and record a sound, the relationship between the keys played and the pitch of the reproduced sound will have the relationship shown here.



$C_1 \longleftarrow \qquad C_2 \qquad \longrightarrow B_3$

Keys lower than C2 will produce a pitch lower than the recorded sound. When the sampling note C2 is played, the reproduced sound will have the same pitch as the sound that was recorded. Keys higher than C2 will produce a pitch higher than the recorded sound.

① Hold down MIDI switch.

② Press SAMPLING switch while depressing MIDI switch.

| PROG NO. | DATA/TIME(ms) |
| --- | --- |
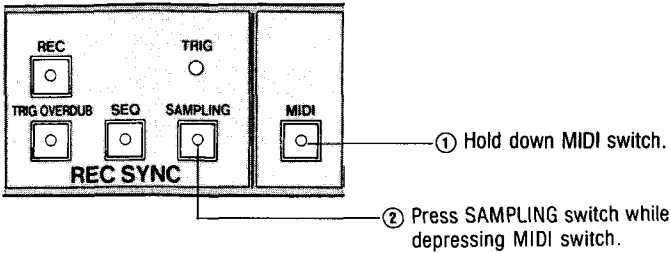


Shows sampling note being set previously.
(F♯1, in this example)

**2 How to set the sampling note.**

[1] Hold down the MIDI switch and press the SAMPL-ING switch at the same time.
The display will flash, indicating the current sampling note setting.

[2] Press the MIDI switch and the SAMPLING switch; at the same time turn the INCREMENTAL CONTROL knob to set the sampling note.
When a MIDI keyboard is connected and the send and receive channels match, then you can play a note on the keyboard to set the sampling note. The sampling note can be set at any semitone step within the supported note range.

● The sampling note setting is retained when the power is turned off.
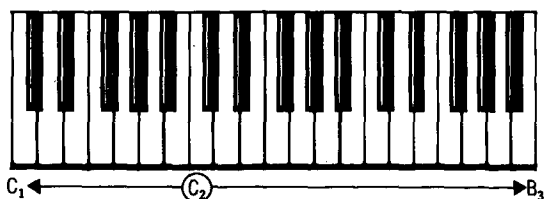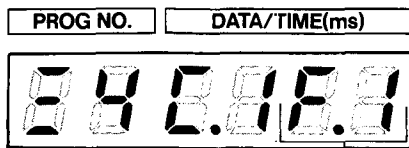
> **NOTE:**
> Be sure to set the time mode ($\times 4$ or $\times 1$) and supported note range before setting the sampling note.
> The sampling note must be set before recording. Changing it after recording will not cause any change in the reproduced sound.

# 3. MIDI DATA PROCESSING SETTING

Example: Using sampling mode.



Set not to respond to NOTE OFF data.

Reproduction continues to end of recorded sound even after key is released.

Set to respond to NOTE OFF data.

Sound is reproduced until key is released.

Key depressed (NOTE ON)　Key released (NOTE OFF)
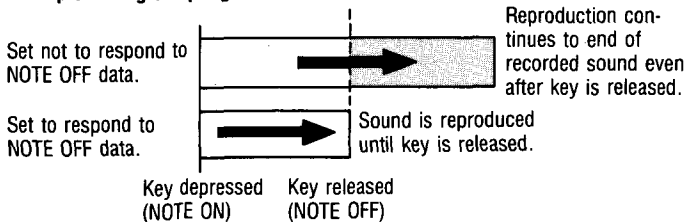
**1 Reception of NOTE OFF data.**
If the SDD-2000 is set to respond to NOTE OFF* data, then the release of a key on the MIDI keyboard will stop reproduction of recorded sounds in the sequencer and sampling modes. That is, sound will only be reproduced while a key is depressed. See step 3 below for instructions on the setting procedure.

> * NOTE OFF data is the MIDI data that indicates that a key has been released.

**2 Reception of VELOCITY data.**
When set to respond to VELOCITY* data, the volume of the reproduced sound will depend on how hard keys are played on the MIDI keyboard, if the keyboard (or other MIDI device) itself can produce VELOCITY data.
In this case, the EFFECT parameter value (which controls reproduced volume) will be ignored and volume will depend on received VELOCITY data. See step 3 for instructions on the setting procedure.

┌─────────────────────────────────────────┐
│ **\*VELOCITY (NOTE ON) data:** MIDI NOTE ON data │
│ tells when a key is played, which key is played, and │
│ how hard it is played. VELOCITY data is the part of │
│ the NOTE ON data that indicates how hard the key │
│ is played. │
└─────────────────────────────────────────┘

**⊠ How to set MIDI data processing parameters.**
Follow the steps below to set the SDD-2000 to respond to MIDI NOTE OFF and/or VELOCITY data or to ignore it.

[1] Press the MIDI switch and at the same time press the SEQ (sequencer) or SAMPLING switch.

① Press MIDI switch

② Press either or these switches
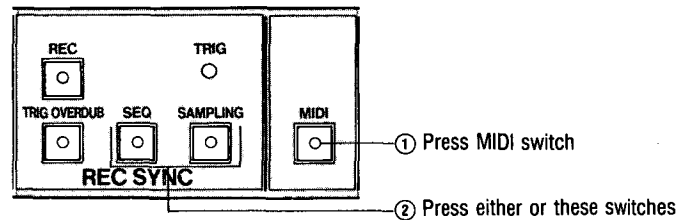
[2] Display shows current settings.

Pressing the REC switch toggles the setting between "response" and "no response" to NOTE OFF data. The upper LED bar lights up when set to respond to NOTE OFF data.

● Pressing the TRIG OVERDUB switch toggles the setting between "response" and "no response" to VELOCITY data. The lower LED bar lights up when set to respond to VELOCITY data.
Then, the time mode can be changed by pressing the TIME ×4 switch.

● These settings are retained when the power is turned off.

| PROG NO. | DATA/TIME(ms) |

This bar (LED) illuminates when set to respond to VELO-CITY data.

This bar (LED) illuminates when set to respond to NOTE OFF data.
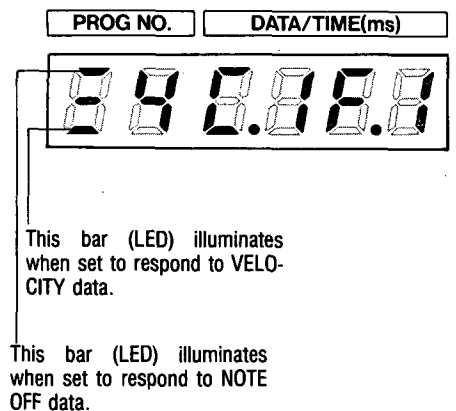
# 4. REC CALIBRATION

When using the sequencer or sampling modes with a MIDI keyboard, reproduced pitch may not be quite right. In this case, you can have the SDD-2000 calibrate itself to achieve pitch accuracy. This procedure is called REC CALIBRATION. It is useful to perform REC CALIBRATION before recording and after adjusting the rear panel TUNE control.

REC CALIBRATION can be performed in the recording standby condition and during playback. The SDD-2000 also performs REC CALIBRATION automatically immediately after recording.

This LED on.    Flashes slowly    Recording standby display

Flashes rapidly
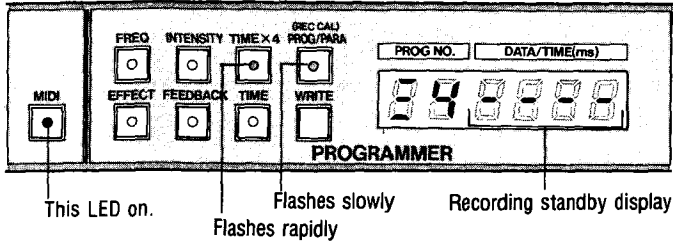
● **REC CALIBRATION during recording standby.**
The display appears as shown below right before a signal is input for recording (that is, during recording standby).

REC CALIBRATION display



Indicates that calibration is in progress.

Shows note being calibrated (A # in this example).

This LED on.
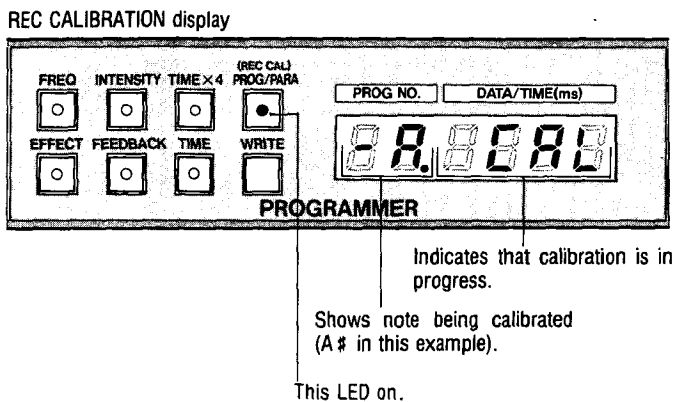
Press the REC CAL (PROG PARA) switch (the one with the slowly flashing LED).
The SDD-2000 then performs calibration for the notes C through B. The display appears as shown here.

When REC CALIBRATION ends, the display returns to the recording standby condition.
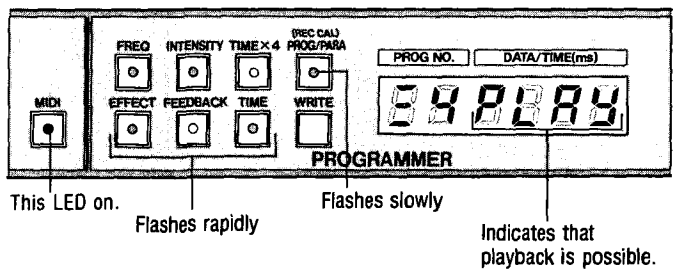
● **REC CALIBRATION in playback condition.**
In the playback condition, the display appears as shown here.
Press the REC CAL (PROG PARA) switch (the one with the slowly flashing LED). The REC CALIBRATION display will appear.
The SDD-2000 then performs calibration for the notes C through B. Upon completion the "PLAY" indication appears again on the display.



This LED on.    Flashes slowly

Flashes rapidly    Indicates that playback is possible.

● The SDD-2000 automatically performs REC CALIBRATION immediately after recording even if you do not press the REC CAL switch.

**The display changes in the pattern shown below.**



Recording standby indication



Recording in progress



Calibration in progress



Indicates that playback is possible

# RECORDING/PLAYBACK PROCEDURE

# 1. BASIC SETTING

1 Turn off power on the SDD-2000 and equipment to be connected. Use a MIDI cable to connect the SDD-2000 MIDI IN jack to the MIDI OUT jack of the keyboard or other MIDI device.
Refer to the section on rear panel/connections and connect the amplifier and other equipment.

● Set the SDD-2000 rear panel TUNE control to the center position.

2 After completing all connections turn on power on the SDD-2000 and other equipment.

3 Adjust input level so that the HEADROOM indicator +6dB LED illuminates occasionally on the highest signal peaks.

DW-6000 etc.
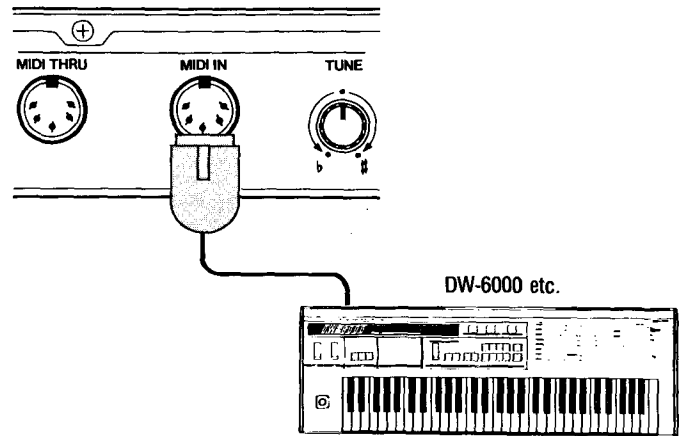
# 2. RECORDING AND PLAYBACK

1 Press the MIDI switch so that its LED illuminates.
● Next, refer to the section on setting the MIDI RECEIVE CHANNEL. Set the SDD-2000 RECEIVE CHANNEL to match the MIDI sending channel on the keyboard or other MIDI device.

This LED on.

2 NOTE OFF data processing setting.
(See section on MIDI data processing.)

① While keeping the MIDI switch depressed, press the SEQ or SAMPLING switch.
② Press the REC switch to shift back and forth between "response" and "no response" to NOTE OFF data.
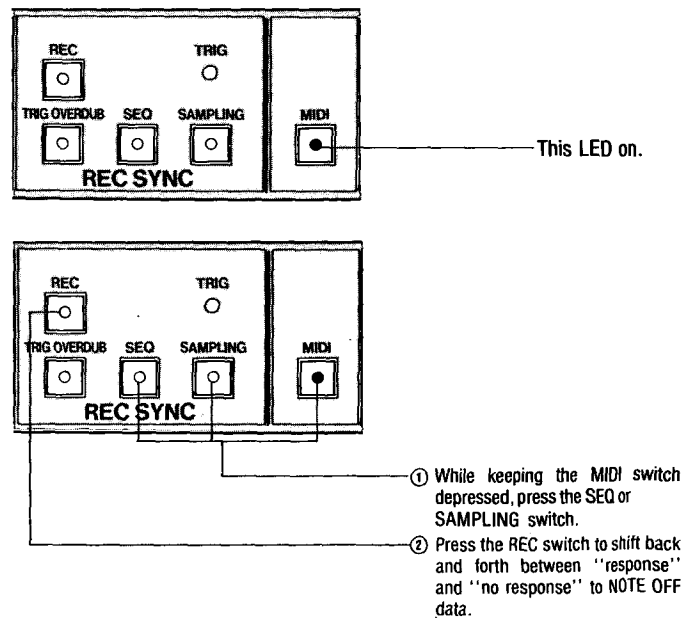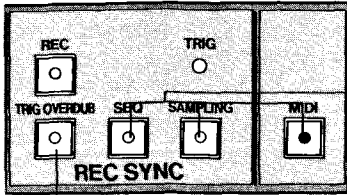
① While keeping the MIDI switch depressed, press the SAMPLING

② Press the TRIG OVERDUB switch to shift back and forth between "response" and "no response" to VELOCITY data.

3 VELOCITY data processing setting.
(See section on MIDI data processing.)
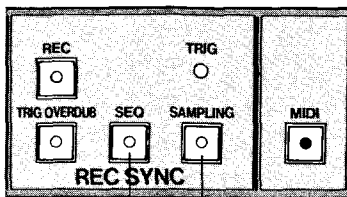


Press SEQ or SAMPLING switch.

4 Press the SEQ (sequencer) or SAMPLING switch to select the mode.
● Delay mode parameter settings (frequency, intensity, effect) will be carried over into the sequencer and sampling modes.
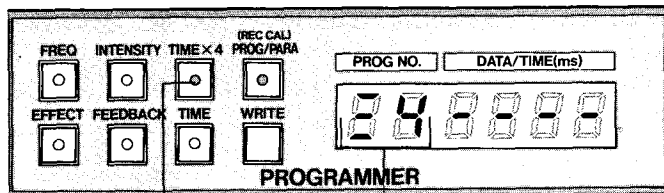


Flashing

Indicates time mode (×4 mode shown here).

5 The display will appear as shown here.
● Press the TIME × 4 switch to select the time mode according to your requirements for recording time and supported note range.
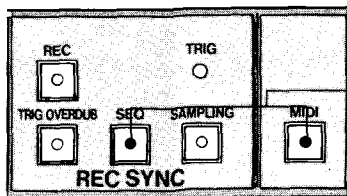


① While keeping the MIDI switch depressed, press the SEQ switch.

② Turn the INCREMENTAL CONTROL knob or play the MIDI keyboard to selecte the lowest note of the supported note range.

6 Set the supported note range.
(See section on supported note setting.)
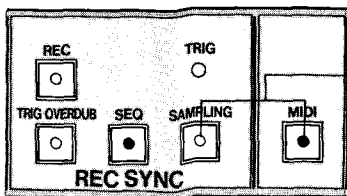


① While keeping the MIDI switch depressed, press the SAMPLING switch.
② Turn the INCREMENTAL CONTROL knob or play the MIDI keyboard to select the sampling note.

7 Set the sampling note.
(See section on sampling note setting.)

8 Press the REC CAL (PROG/PARA) switch to perform REC CALIBRATION.
(See section on REC CALIBRATION.)

Press PROG/PARA switch          Recording standby display
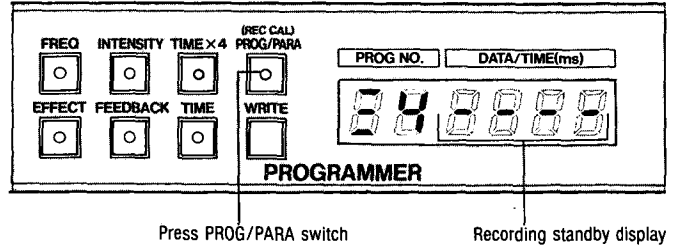
9 Begin playing the sound that you want recorded. Recording will begin automatically when input signal level reaches + 3dB, as shown on the HEADROOM indicator.

Flashes "rEC" to indicate recording in progress.
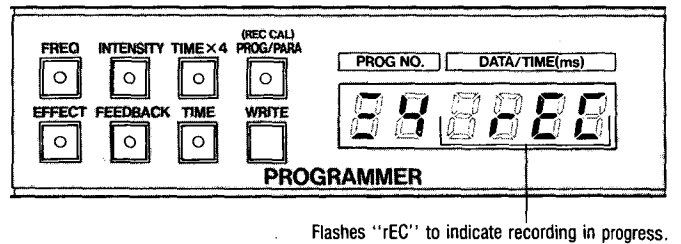
10 Press the REC switch at the point that you want recording to end.
● If you do not press the REC switch then recording will end at the maximum time as determined by the TIME ×4 switch setting and the sampling note setting. (See NOTE.)

Press REC switch.

---
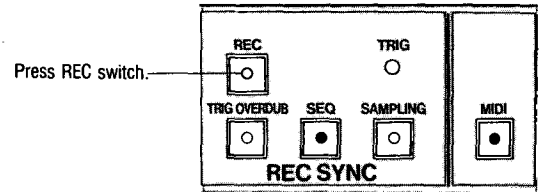
**NOTE:**
If the sampling note is set higher than the lowest note in the supported note range then the maximum recording time will be shorter than the usual maximum of 4368ms in the ×4 mode or 1092ms in the ×1 mode.

---

● REC CALIBRATION is performed automatically after recording has been completed. (See section on REC CALIBRATION for details.)

11 Playback can begin after recording. The display appears as shown here.

● In the sequencer mode, the sound is reproduced at its original pitch immediately after recording. Play the keyboard within the supported note range to change the pitch of the reproduced sound.

● In the sampling mode, play the keyboard within the supported note range to reproduce the sound at the pitch you desire. The sound is reproduced from the beginning each time a key is played.
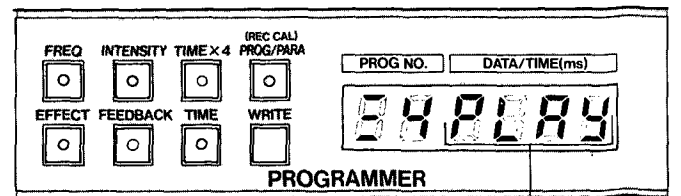
Indicates that playback is possible. ("PLAY" indication.)

● Press the REC switch if you wish to record again. Then repeat the procedure from step 8.

● To change the time mode, first press the REC switch. Then repeat the procedure from step 5.

> **NOTE:**
> If you change the time mode then the supported note range and sampling note will change.

# 3. OPERATION IN THE PLAYBACK CONDITION

Frequency, intensity, effect, and time LEDs are flashing.

Time value after editing.    Time value before editing.

After editing, this portion is no longer reproduced.
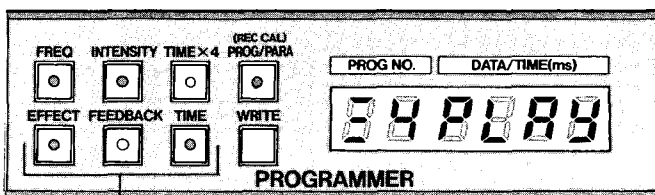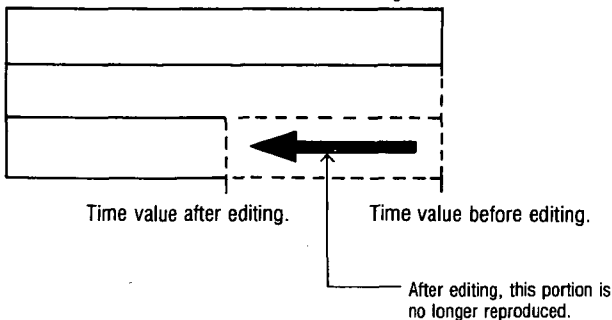
● **Editing parameters.**
In the playback condition, you can edit the values of parameters whose switch LEDs are flashing.
Press the switch for the parameter that you wish to edit. While the switch is depressed the display will show the current value and the INCREMENTAL CONTROL knob can be used to adjust the value.

● **Editing the Time Parameter**
After a recording has been made, you can shorten the length of the recording by editing the TIME parameter. This shaves off the recording from the end. To reduce the length of a recording, hold down the TIME switch and turn the INCREMENTAL CONTROL knob.
Note that recordings can only be made shorter; they can not be made longer than the original recording time.

> **NOTE:**
> In the sampling mode no sound will be reproduced if you reduce the time to around 120ms in the ×4 mode or 30ms in the ×1 mode.

● **Changing the supported note range.**
Refer to the section on the supported note range.

● **Changing the NOTE OFF and VELOCITY data processing settings.**
Refer to the section on MIDI data processing.

● **Pitch bends:**
The SDD-2000 will respond to pitch bend (pitch wheel change) data. Pitch can be bent up or down to a maximum of 3 degrees.

- **MODULATION:**
  This unit responds to MIDI control change No.1 modulation data, so vibrato can be added to the reproduced sound. Vibrato speed can be edited with the frequency parameter. Concerning vibrato depth, please refer to the note on page 37."

- **Pitch adjustment for reproduced sound.**
  The SDD-2000 rear panel TUNE control can be used to adjust the pitch of the reproduced sound by up to ±50 cents. Perform REC CALIBRATION after adjusting the TUNE control.

- **To return to the delay mode:**
  Press the presently selected mode switch (SEQ or SAMPLING) so that its LED goes out. This returns you to the delay mode.
  Frequency, intensity, and effect parameter values are carried over into the delay mode.

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> The recorded sound is erased from memory when the SDD-2000 power is turned off. If you wish to save the sound, record it on tape before turning off the power.

---

| | |
|---|---|
| **1. Input** | (INPUT LEVEL)    (IMPEDANCE)    (MAX CLIP LEVEL)<br>  − 35dBm         47kΩ           + 6dBm<br>  − 10dBm         500kΩ        + 19dBm |
| **2. Output (unity)** | (OUTPUT LEVEL)   (IMPEDANCE)    (MAX CLIP LEVEL)<br>  − 35dBm         600Ω       − 20dBm (DIRECT)<br>                 600Ω       − 20dBm (EFFECT)<br>  − 10dBm         600Ω       + 6dBm (DIRECT)<br>                 600Ω       + 3dBm (EFFECT) |
| **3. Frequency response** | 20Hz∼20KHz   ± 1dB (DIRECT)<br>30Hz∼18KHz   + 1dB, − 3dB (EFFECT) (× 1 mode)<br>30Hz∼4.5KHz   + 1dB, − 3dB (EFFECT) (× 4 mode) |
| **4. Dynamic range** | 90dB (IHF) (EFFECT) or more<br>95dB (IHF) (DIRECT) or more |
| **5. S/N ratio** | 80dB (IHF) (EFFECT) |
| **6. Distortion** | 0.05% (DIRECT)<br>0.1% (EFFECT) |
| **7. Delay time** | 0-4368ms (in 1ms steps)<br>  0-1092ms (× 1 mode: can be set in 0.1ms steps from 1 to 10ms)<br>  0-4368ms (× 4 mode) |
| **8. Feedback** | 63 steps    0∼31 (positive phase)   0:0%   31: 110%<br>              0∼ − 31 (inverted phase) 0:0%  − 31: 110% |
| **9. Modulation** | Modulation waveform: Triangle wave<br>Modulation frequency: 0.1Hz-10Hz (FREQ parameter values: 0 = 0.1Hz; 31 = 10Hz)<br>Delay time modulation range: 2:1 (at INTENSITY 31) |
| **10. Dimensions** | 482(W) × 44(H) × 344(D)mm |
| **11. Weight** | 4.5kg |
| **12. Power supply voltage** | Local voltage |
| **13. Power consumption** | 17W |
| **14. Supplied accessories** | Rack molunting screws × 4 |
| **15. Options** | Connection cord   MIDI cable<br>Foot switch (PS-1, S-2)  Hard case |

# 2. BLOCK DIAGRAM

HEAD ROOM

LED DRIVER

INPUT

ATTENUATOR
−10dB
−33dB

AMP

INPUT LEVEL

AMP

LPF × 1

LPF × 4

REC CANCEL

PRE-EMPHASIS

COMPRESSOR

A/D & D/A
12 bit CONVERTER

MODULATION

FREQUENCY

DIGITAL CONTROLLED LFO

INTENSITY

PROGRAMMABLE ATT

VCO

PITCH SHIFT LOGIC

KORG CUSTOM LSD

CONTROL SWITCH & JACK

MIDI THRU

MIDI IN

CPU

EFFECT OUTPUT

LEVEL (dB)

| | | |
|---|---|---|
| 0 | | |
| −5 | | |
| −10 | | |
| −20 | | |
| −30 | | |
| −40 | | |
| −50 | ×4 | ×1 |

20    50    100    500    1K    5K    10K    20K    FREQUENCY (Hz)

FEEDBACK PHASE

(GAIN: UNITY)
ATTENUATOR

AMP
−10dB
−35dB
DIRECT
OUTPUT

XPANDER
LPF × 1
BYPASS/
DELAY OFF
DE-
EMPHASIS
FEEDBACK LEVEL
PROGRAMMABLE
ATT

INV

LPF × 4

AMP
−10dB
−35dB
+ MIX
OUTPUT

EFFECT LEVEL
PROGRAMMABLE
ATT

INV

AMP
−10dB
−35dB
− MIX
OUTPUT

512kbit DYNAMIC MEMORY

DIRECT
LEVEL
BYPASS

AMP

PROGRAM
MEMORY

PROG. NO    DATA/TIME (ms) DISPLAY

88.8.88.8

# 3. FREQUENCY RESPONSE GRAPH

# MIDI IMPLEMENTATION

## 1. CHANNEL MESSAGES

| Status | Byte-2 | Byte-3 | |
|---|---|---|---|
| 1 0 0 0  n n n n | 0 k k k   k k k k | 0 x x x   x x x x | Note off<br>Velocity ignored |
| 1 0 0 1  n n n n | 0 k k k   k k k k | 0 v v v   v v x x | Note on (see note 1)<br>(0vvv vvvv > 0) (see note 2) |
| | 0 k k k   k k k k | 0 0 0 0   0 0 0 0 | Note off |
| 1 0 1 1  n n n n | 0 0 0 0   0 0 0 1 | 0 v v v   v v x x | Modulation (see note 3) |
| 1 0 1 1  n n n n | 0 1 1 1   1 0 1 1 | 0 0 0 0   0 0 0 0 | All notes off |
| | 0 1 1 1   1 1 0 0 | 0 0 0 0   0 0 0 0 | Omni off<br>(All notes off) |
| | 0 1 1 1   1 1 0 1 | 0 0 0 0   0 0 0 0 | Omni on<br>(All notes off) |
| 1 1 0 0  n n n n | 0 x p p   p p p p | | Program change (See note 4) |
| 1 1 1 0  n n n n | 0 x x x   x x x x | 0 b b b   b b b b | Pitch bend (See note 5)<br>2nd byte ignored |

**Note 1:** Data is ignored if it is out of the range set in the supported note.

**Note 2:** Note on velocity has 5-bit resolution.

**Note 3:** Modulation has 5-bit resolution.
Bit-0 and bit-1 are ignored.

**Note 4:** Program number are 0-63. Bit-6 is ignored.

**Note 5:** Pitch bends have 7-bit resolution. The 2nd byte is ignored.
0bbb bbb = 0111 1111 causes +3 degree change.
0bbb bbbb = 0000 0000 causes −3 degree change.

## 2. REAL TIME MESSAGES

| Status | Byte-2 | Byte-3 | |
|---|---|---|---|
| 1 1 1 1   1 0 0 0 | | | Timing clock |
| 1 1 1 1   1 1 1 0 | | | Active sensing |

## 3. COMMON MESSAGES

| Status | Byte-2 | Byte-3 | |
|---|---|---|---|
| 1 1 1 1   0 1 1 1 | | | End of exclusive |

## 4. EXCLUSIVE MESSAGES Refer to the SDD-2000 MIDI EXCLUSIVE for details on 3 and 4.

| Status | Byte-2 | Byte-3 | |
|---|---|---|---|
| 1 1 1 1   0 0 0 0 | 0 1 0 0   0 0 1 0 | 0 0 1 0   0 0 0 1 | 0 0 0 0   0 1 0 1 |

# SDD-2000 MIDI EXCLUSIVE

## 1. PROGRAM DATA FORMAT

A MIDI equipped personal computer can be used to load up to 64 programs into the SDD-2000. (But programs can not be saved from the SDD-2000 to the computer.)

1. Programs are made up of 8-byte words as shown in the chart below.

|  | bit 7 | bit 6 | bit 5 | bit 4 | bit 3 | bit 2 | bit 1 | bit 0 |
|---|---|---|---|---|---|---|---|---|
| Byte 0 | 0 | TM 6 | TM 5 | TM 4 | TM 3 | TM 2 | TM 1 | TM 0 (LSB) |
| Byte 1 | 0 | TM 14 | TM 13 | TM 12 | TM 11 | TM 10 | TM 9 | TM 8 |
| Byte 2 | 0 | TM 15 (MSB) | TM 7 | FB 4 (MSB) | FB 3 | FB 2 | FB 1 | FB 0 (LSB) |
| Byte 3 | 0 | 0 | 0 | FQ 4 (MSB) | FQ 3 | FQ 2 | FQ 1 | FQ 0 (LSB) |
| Byte 4 | 0 | 0 | 0 | INT 4 (MSB) | INT 3 | INT 2 | INT 1 | INT 0 (LSB) |
| Byte 5 | 0 | 0 | 0 | EFF 4 (MSB) | EFF 3 | EFF 2 | EFF 1 | EFF 0 (LSB) |
| Byte 6 | 0 | 0 | 0 | 0 | 0 | 0 | ×4 | INV. |
| Byte 7 | Byte 7: Not used yet. | | | | | | | |

**1** **Time data (Maximum value: FFF0H)**
×1 mode (Byte-6 bit-1 must be 0)
• 0 ~ 10ms (0.1ms steps)
06H steps
• 10 ~ 1092ms (1ms steps)
3CH steps

×4 mode (Byte-6 bit-1 must be 1)
• 0 ~ 4368ms (1ms steps)
0FH steps
**Example:** ×1 mode with 500ms delay time.
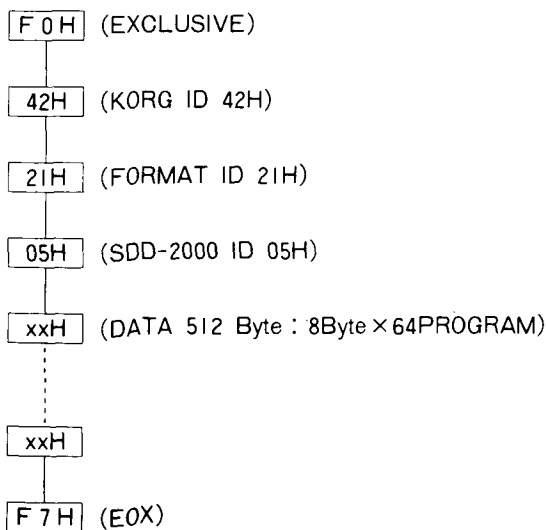Greater than 10ms so 3CH steps.
500(D) = 1F4(H)
1F4H × 3CH = 9530H

**2** **Parameters (Maximum value: 1FH)**
Steps 0 ~ 31 correspond to hex values of 00H ~ 1FH.

*Feedback phase is inverted by setting byte-6 bit-0 to 1.

## 2. SEND FORMAT

| F 0 H | (EXCLUSIVE)

| 42H | (KORG ID 42H)

| 21H | (FORMAT ID 21H)

| 05H | (SDD-2000 ID 05H)

| xxH | (DATA 512 Byte : 8Byte × 64PROGRAM)

| xxH |

| F 7 H | (EOX)

# SDD-2000 PRELOAD PROGRAM LIST

| PROG No. | NAME | DELAY TIME(msec) (×1 mode) | FEED BACK | FREQ | INT | EFFECT |
|---|---|---|---|---|---|---|
| 11~18 | Short delay | 130 | 17 | 7 | 0 | 20 |
| 21~28 | Long delay | 400 | 15 | 7 | 0 | 25 |
| 31~38 | Doubling I | 30 | 0 | 7 | 0 | 25 |
| 41~48 | Doubling II | 30 | 0 | 3 | 5 | 15 |
| 51~58 | Chorus | 10 | 0 | 2 | 29 | 26 |
| 61~68 | Flanging I | 2 | 28 | 1 | 25 | 31 |
| 71~78 | Flanging II | 2 | −27 | 1 | 31 | 25 |
| 81~88 | Vibrato | 10 | 0 | 20 | 26 | 31 |

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