DIGITAL DELAY
SDD-1000

OWNER'S MANUAL

KORG®

KORG DIGITAL DE

MAJOR FEATURES

Congratulations and thank you for purchasing the KORG SDD-1000

1 Offers delay time range from 1ms (0.001 sec.) to 2048ms (2.048 sec.) for a wide variety of effects including flanging, doubling, chorusing, short echo, long echo, and newly designed REC SYNC functions. Frequency response of 30Hz ~ 10kHz means excellent sound quality at delay times of 1 ~ 1024ms. At the 2048ms position, frequency response is 30Hz ~ 5kHz.

2 Modulation section permits chorus, doubling, flanging, and other effects. 4 : 1 modulation ratio enables pitch bends of up to 2 octaves.

3 Versatile REC SYNC has three effects:

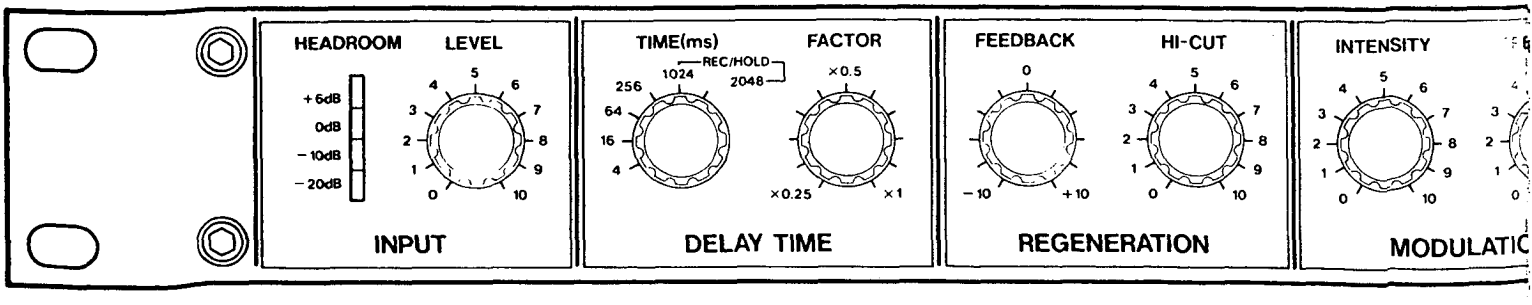
- SEQUENCER setting plays back phrases of up to 2048ms.
- SAMPLING setting allows recording of a phrase up to 2048ms; this can then be played back as triggered by a drum machine or foot switch.
- TRIGGER OVERDUB setting lets you set delay time with a footswitch or cyclic trigger source.

4 REC CANCEL lets you switch to a dry sound while keeping the last delay sound. This eliminates the unnatural change produced by a conventional bypass switch. Lets you add a new phrase on top of an echo.

5 HIGH CUT filter permits up to 24dB attenuation at 10kHz. Useful for warm, natural delay effects.

6 HOLD function produces an endless repeat without degraded sound quality.

7 DIRECT output as well as MIXed positive and negative phase outputs are provided for varied stereo effects. Input and output level is kept at unity to simplify settings on connected equipment.



LAY SDD-1000

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.

Maintenance

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

Digital Circuit Protection

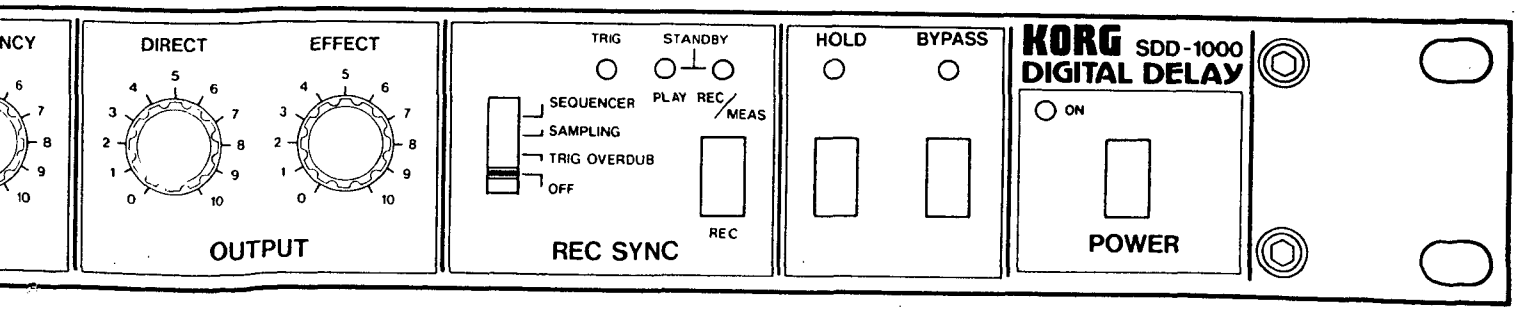
As a digital device employing computer circuitry, the SDD-1000 is subject to interference from other electrical devices and fluorescent lamps. Avoid use near other appliances. Should interference occur, try placing further away from the source of trouble.

Warranty

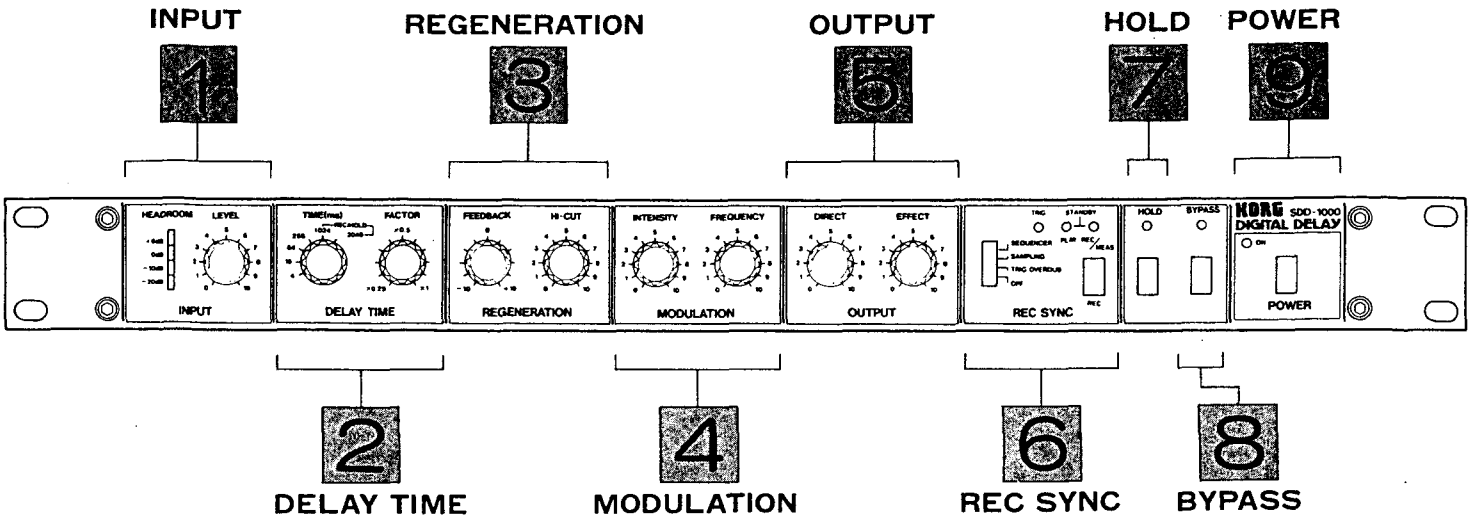
For full warranty protection, return your properly filled in warranty card.

Keep This Owner's Manual

Store this manual in a safe place for future reference.



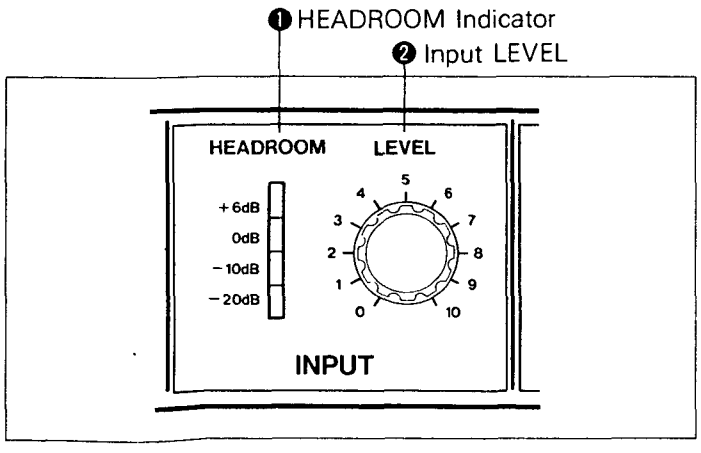
FRONT PANEL



1. Input Section

❶ HEADROOM LED Meter
Provides a reference for input level setting. This meter also shows the results of adding feedback to the sound. Signal level rises at higher feedback settings. Therefore, readjust input level after applying feedback.

❷ Input LEVEL Control
For optimum performance, adjust the INPUT knob so the 0 LED lights up at the highest input signal peaks (loudest parts of the music). Too low a setting will degrade the signal-to noise ratio. Too high a setting will cause increased distortion.

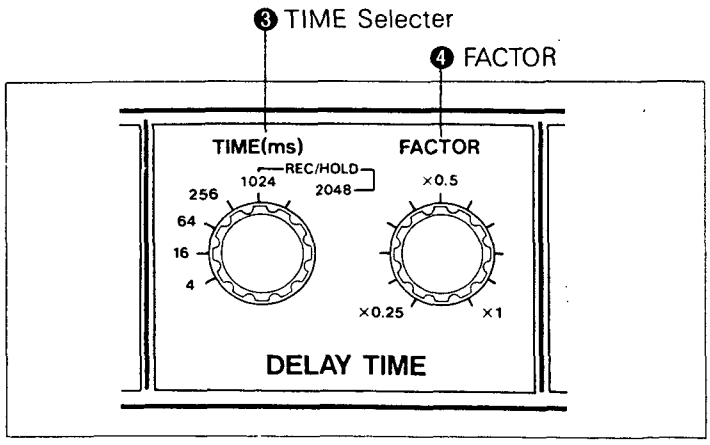


NOTE:
The rear panel INPUT attenuator switch should be set to the position that matches the output level of connected equipment feeding the SDD-1000. See explanation in REAR PANEL section.

2. Delay Time Section

❸ TIME Selector
Sets maximum length of delay in milliseconds. Numbers correspond to longest delay time obtainable at each position. Chart shows typical uses of these different delay times.

❹ FACTOR Control
Lets you reduce the delay time selected with the TIME selector. The TIME setting multiplied by the FACTOR setting equals the delay time.
Example: 16ms × 0.5 = 8ms.



TIME(ms)	4	16	64	256	1024	2048
	flanging,	chorus, doubling				
		short delay				
			normal delay			
				long delay		

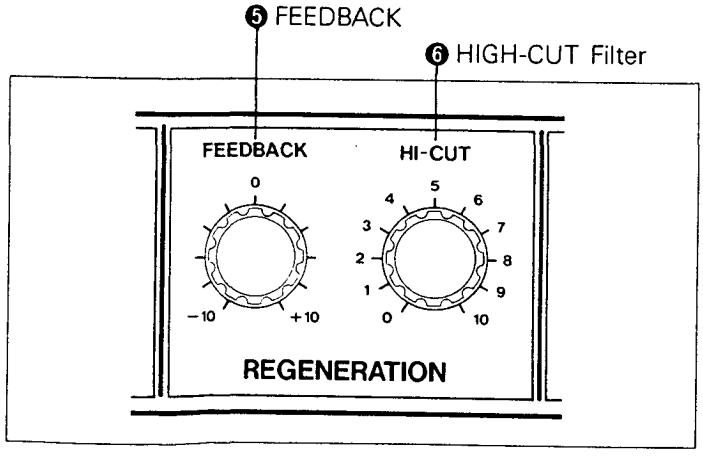
HOLD, REC

NOTE:
Because of the memory space required for such a long delay, the frequency response at the 2048ms delay position is rated at 30Hz ~ 5kHz. At the other positions response extends from 30Hz ~ 10kHz.

3. Regeneration Section

❺ FEEDBACK Control
Controls how much of the delayed signal is fed back through the delay circuitry. At the center 0 position there is no feedback. Turn to the + side for normal phase feedback: the higher the setting, the more repeats. The – side (inverted phase) is most useful with short delays when you need a more obvious flanging or related effect.

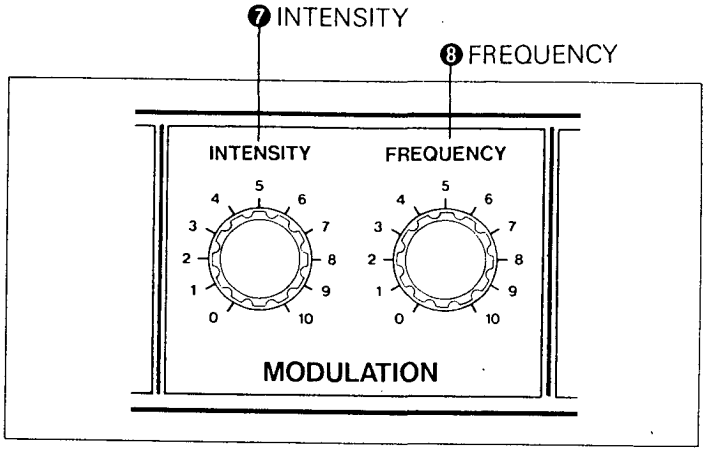
❻ HI-CUT Filter
The higher the setting, the more the high frequencies will be rolled off. This only affects the delay sound, not the direct sound. Higher FEEDBACK settings will also cause more filtering, since the delay signal passes through the delay and filtering circuitry a number of times.



4. Modulation Section

❼ INTENSITY Control
Determines how much the delay time will be affected by the internal LED (low frequency oscillator) signal. Higher settings produce greater modulation depth. There is no effect at 0.

❽ FREQUENCY Control
Sets LFO frequency (speed) used to modulate delay time. Can be set from 0.1Hz ~ 10Hz (0.1 cycle to 10 cycles per second).



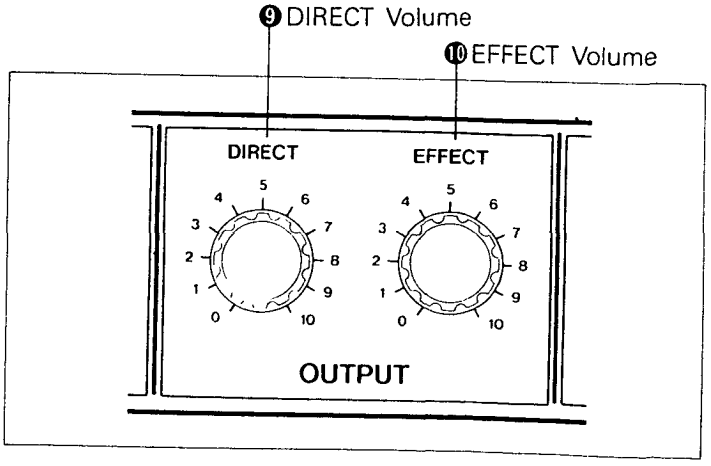
ABOUT MODULATION

The SDD-1000 has an internal LFO (low frequency oscillator) that generates a regular or cyclic output signal. The delay time then varies according to the LFO signal. Depending on the combination of the delay time, regeneration, and modulation settings you can create such effects as chorus, vibrato, flanging, and doubling.

5. Output Section

❾ DIRECT Volume Control
Controls volume of direct signal at +MIX and –MIX jacks, (The DIRECT jack's output level is not affected by this knob.)

❿ EFFECT Volume Control
Controls volume of the delayed signal.



NOTE:
These volume knobs only affect the output level when the BYPASS switch is turned off. Adjust so that the total level stays the same when the BYPASS switch is turned on and off.

6. REC SYNC Section

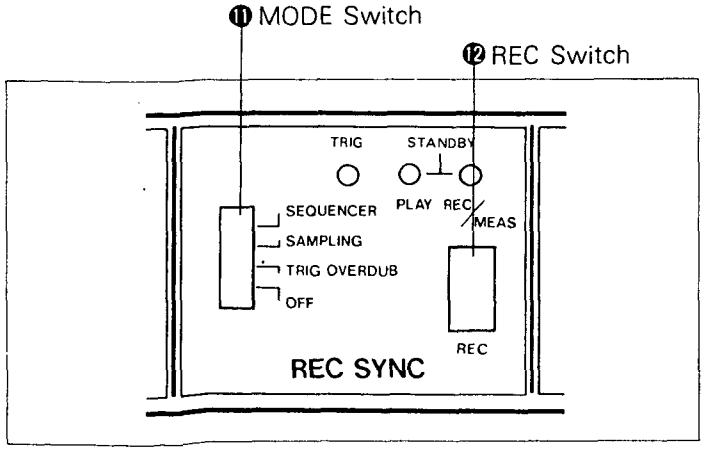
⓫ MODE Swtich
Selects mode of REC SYNC operation.

- **SEQUENCER**
  Records a phrase of up to 2048ms (slightly over 2 seconds) and then immediately starts playing it back repeatedly.

- **SAMPLING**
  Records a phrase of up to 2048ms and then plays it back whenever triggered by a foot switch (or other trigger source).

- **TRIG OVERDUB**
  Lets you use foot switch, synthesizer, or drum machine trigger signals to set the delay time.

- **OFF**
  Turns off REC SYNC operation. When REC SYNC is off, the SDD-1000 operates as a conventional digital delay unit.



⓬ REC Switch
In the SEQUENCER mode this switches between recording and playback.

In the SAMPLING mode it switches to recording standby.

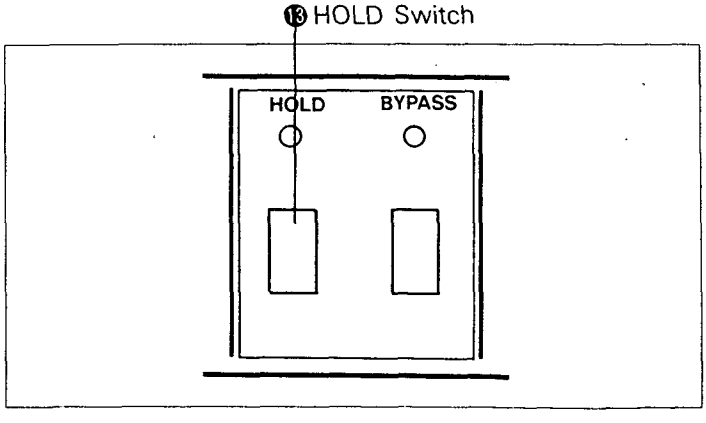
In the TRIG OVERDUB mode it will set the delay time. (For details, see "USING REC SYNC" on page 9)

NOTE:
Previously recorded contents of REC SYNC modes will be lost if MODE switch setting is changed or power is turned off.

7. HOLD

⓭ HOLD Switch
At the 1024 or 2048ms delay time settings this switch can be pressed to produce an endless non-decaying repeat of the signal. Press again to cancel the hold mode and return to normal.

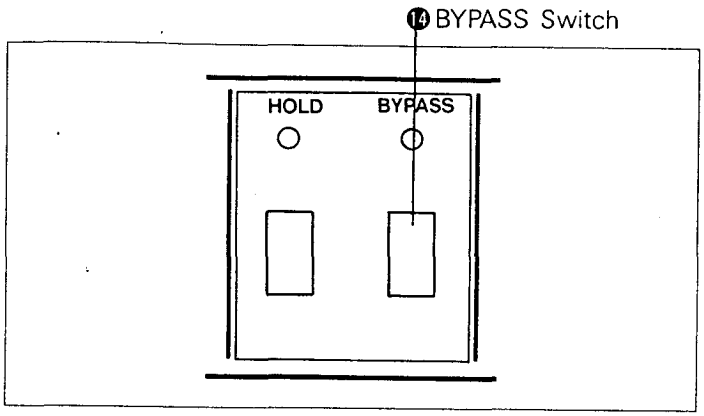
An LED lights up above the HOLD button to confirm operation. A foot switch (PS-1, S-2, etc., or any "normally open" momentary switch) can be connected to the rear panel HOLD jack to enable remote control.



NOTE:
- The HOLD mode will only work at DELAY TIME knob settings of 1024 and 2048. Once HOLD is on, you can use the FACTOR knob to change the pitch of the sound.
- HOLD can be used with TRIG OVERDUB. See "USING REC SYNC" on page 9 for details.

8. BYPASS

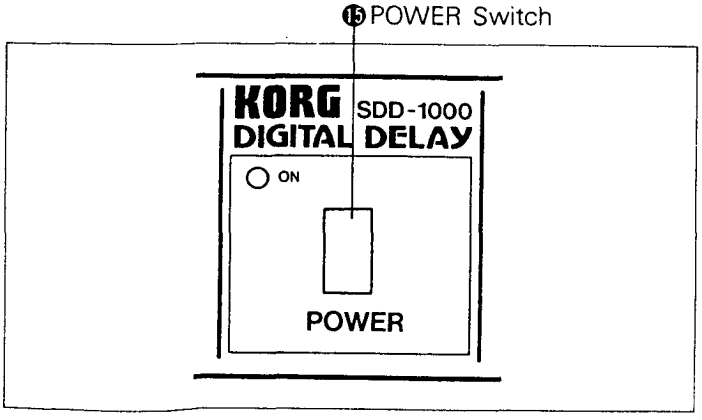
⓮ BYPASS Switch
Press this button to turn off the SDD-1000 effect, so only the direct sound will be heard. Press again to return to the delay sound. A footswitch may be connected to the rear panel BYPASS jack for this purpose.



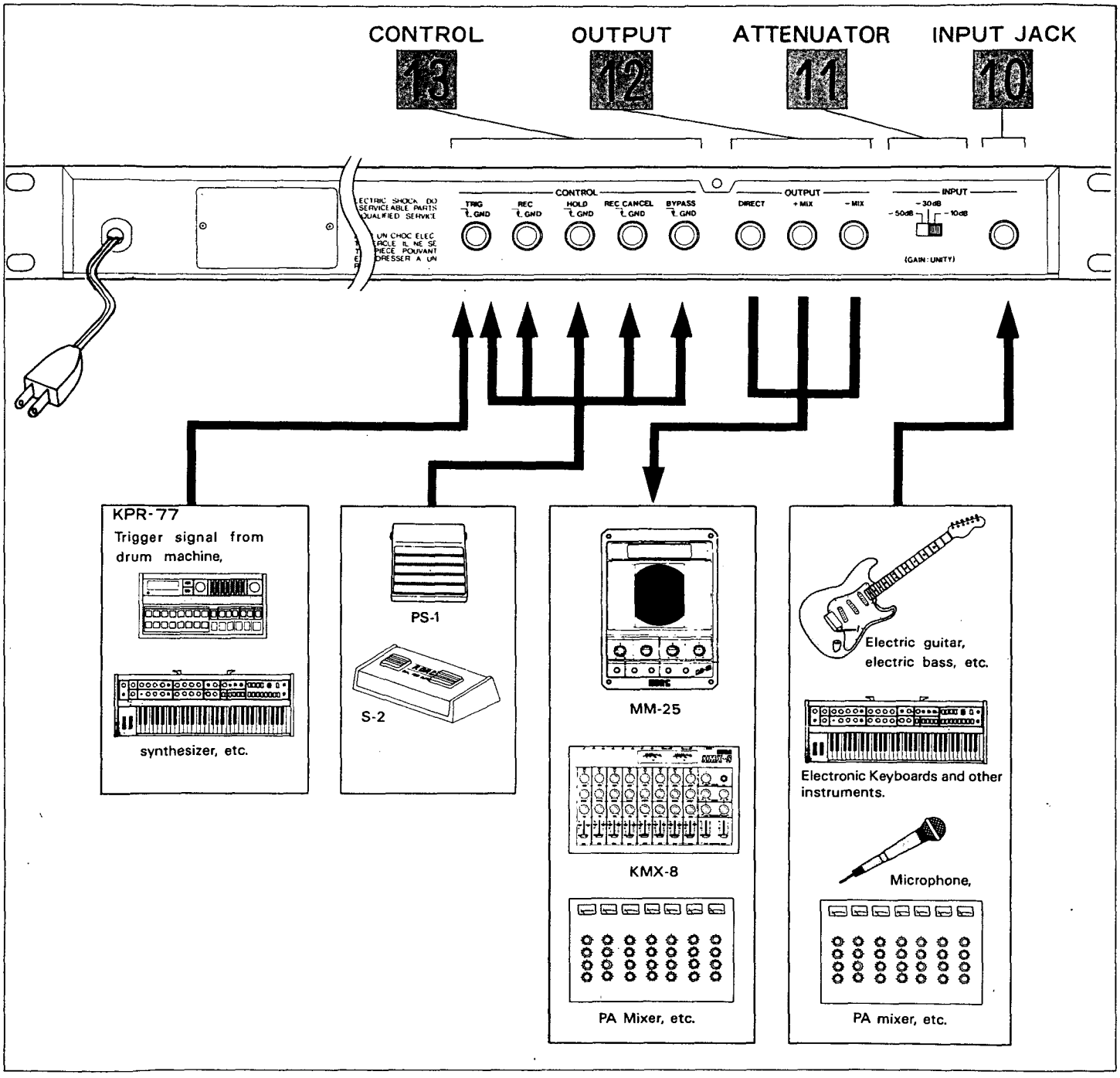
NOTE:
BYPASS can be used with REC SYNC. See "USING REC SYNC" on page 9 for details.

9. POWER

⓯ POWER Switch
Turns power on and off.



Rear Panel



CAUTION:
SDD-1000 power should be off when making connection. Turn amplifier volume to zero (0) before connecting to amplifier.

10. INPUT Jack

11. ATTENUATOR Switch

Set to level that matches connected equipment.

- −50dB: Microphone
- −30dB: Electric guitar, electric piano, or other low output instrument.
- −10dB: Synthesizer, drum machine, other electronic instrument, PA mixer, or audio component

12. OUTPUT Jacks

These three outputs permit two kinds of stereo effects.

DIRECT Jack

Outputs the direct sound only.

+MIX Jack

Provides a mixed output of the direct signal and the delayed signal. Output level and relative balance can be adjusted using the front panel DIRECT and EFFECT volume controls.

−MIX Jack

Provides a mixed output with an inverted phase delayed signal.

- **Stereo Effect "A"**
  Connect the DIRECT and +MIX outputs to different channels and set the mixer's pan pots so that one signal is panned to the right and the other is panned to the left. Set SDD-1000 front panel DIRECT volume control to 0 so the +MIX output signal contains only the delay sound. This mix is mono compatible and can be used for recording.
- **Stereo Effect "B"**
  Connect the +MIX and −MIX outputs to different channels and set the mixer's pan pots so that one signal is panned to the right and the other is panned to the left. In this case the delayed signal in the −MIX output will be of opposite phase to that in the +MIX output. This produces a more expansive stereo effect, and is especially useful in live performance for effects such as flanging an chorusing. It should not be used for recording since mono reproduction will cause the left and right delays to cancel each other, resulting in no effect at all.

OUTPUT LEVEL SETTINGS

The SDD-1000 is designed so that output level is the same as input level. Please make connections accordingly.

Input level	Output level
−50dB −30dB −10dB	−50dB −30dB −10dB

13. CONTROL Section

BYPASS Jack

Connect footswitch for remote control of BYPASS function. Same as front panel BYPASS switch.

REC CANCEL Jack

Controlled by a footswitch, this function causes all incoming signals to bypass the delay circuitry, but any delays that are in progress will continue as usual.

HOLD Jack

Has the same effect as the front panel HOLD switch. Connect a footswitch to this jack for remote control convenience.

REC Jack

For remote control over REC SYNC switching functions. Has same effect as front panel REC switch. As with the REC switch, effect of this input depends on the REC SYNC mode setting.

TRIG Jack

This is also used with the REC SYNC SAMPLING and TRIG OVERDUB modes. In the SAMPLING mode trigger inputs (⏚ GND) to this jack will cause the sampled signal to be played back. In the TRIG OVERDUB mode cyclic trigger signals can be used to determine the delay time, Synth, sequencer, drum machine, or footswitch trigger signals may be used.

ABOUT REC SYNC

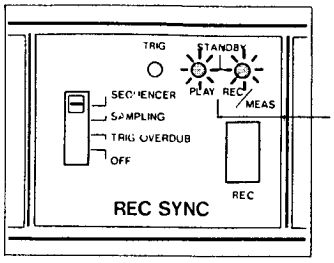
REC SYNC MODES CAN ONLY BE USED WHEN THE TIME KNOB IS SET TO 1024 OR 2048ms.

SEQUENCER

Lets you record and immediately play back phrases in real time. The delay time of the phrase can be varied by the user in real time. Extremely useful in live situations.

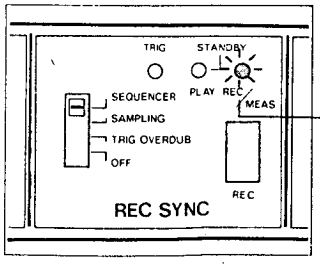
OPERATION

1. Set REC SYNC mode switch to SEQUENCER position.



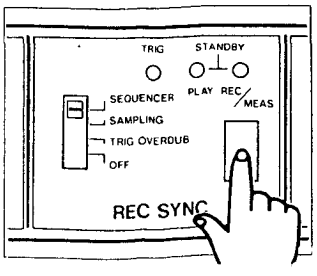
PLAY and REC LEDs are on to indicate standby condition

2. Play something on your instrument. When input level exceeds a certain threshold the SDD-1000 will automatically begin recording.

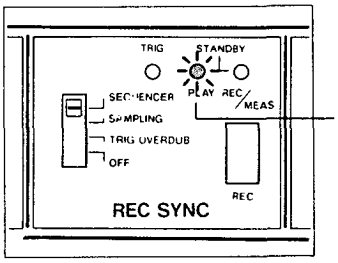


REC LED is on to indicate recording condition.

3. Recording will end when you press the REC switch or a footswitch connected to the rear panel REC jack or the selected delay time runs out, whichever comes first.



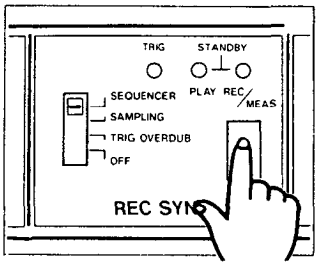
4. As soon as recording is completed the recorded phrase will be played back repeatedly.



PLAY LED lights up to indicated playback condition.

5.A

If you press the REC switch...



PLAY and REC LEDs light up.

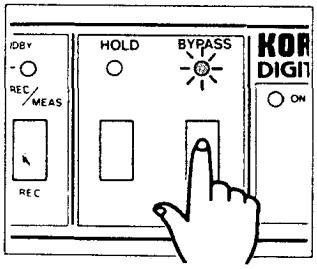
6.A

Then it will go back to standby, waiting for another input (the same as step 1, above).

5.B

If you press the BYPASS switch (or press footswitch connected to BYPASS jack)...

Then the playback sound will stop and you will hear only the direct sound.



6.B

If you press the BYPASS switch again...

Then the recorded phrase will be played back again repeatedly from the beginning (same as in step 3 above).

Therefore you can switch back and forth between direct sound and sequencer playback by simplay pressing the BYPASS switch.

NOTE:

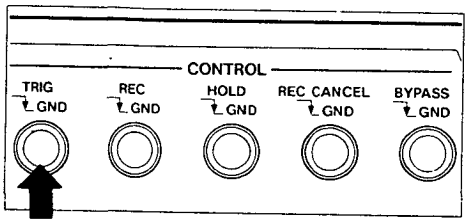
- HOLD will not work in this mode.
- Recording will not begin until the input signal reaches a certain threshold. If input signal is too low to cause recording to begin, readjust input level so that the 0dB HEADROOM LED lights up when the instrument is played at maximum volume.

SAMPLING

Records a phrase up to 2048ms long, then plays it back when triggered by a footswitch, drum machine or other trigger source connected to the rear panel TRIG jack. For example, the SDD-1000 can be used as an additional digital sound source for drum machines with external tirgger outputs.

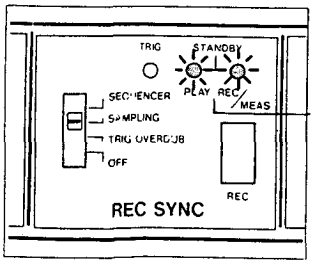
OPERATION

1. Connect footswitch or drum machine trigger output to SDD-1000 rear panel TRIG jack.



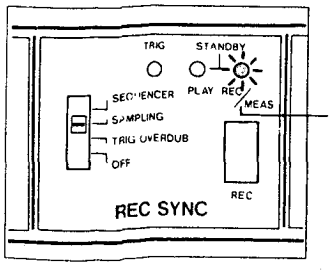
Takes footswitch, drum machine, sequencer, synthesizer, or other tirgger signal.

2. Set REC SYNC mode to SAMPLING.



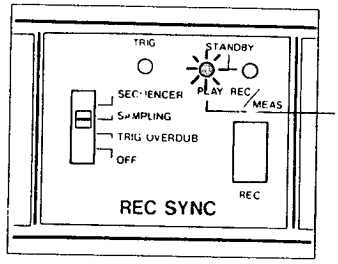
Indicates standby condition.

3. When music input exceeds the threshold level, the SDD-1000 will begin recording.



Indicates recording.

4. When your set delay time has elapsed, recording will stop. You are now ready for playback.



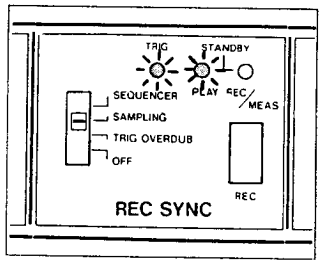
Indicates play condition.

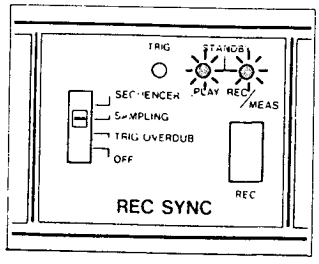
5.A

The recorded sound will be played back from the beginning each time a trigger signal is received at the rear panel TRIG jack.

5.B

To allow recording of a new sound, press the REC switch (or a footswitch connected to the rear panel REC jack). The unit will then be in the same condition as step 2, above.





6.A

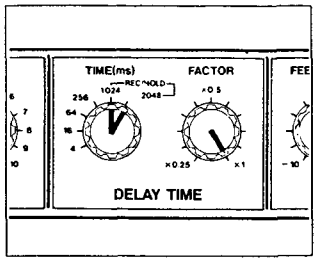
The pitch of the recorded sound can be changed within a 2 octave range by changing the setting of the FACTOR control.

NOTE:

- HOLD will not work with this mode.
- Recording will not begin until the input signal reaches a certain threshold. If input singal is too low to cause recording to begin, readjust input level so that the 0dB HEADROOM LED lights up when the instrument is played at maximum volume.

TRIGGER OVERDUB

This lets you set the delay time by remote control, using a trigger signal from a footswitch alone or in combination with a drum machine or other cyclic trigger souce. This makes it easy to match the delay time to the rhythm or length of the phrase being played. The REC jack (or REC switch) is used alone or together with the TRIG jack.

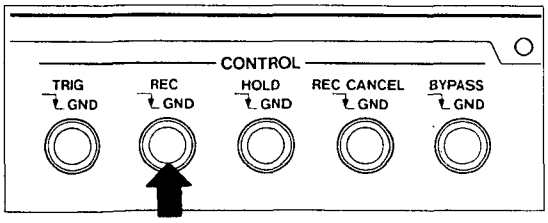


Set FACTOR knob to × 1 position.

A Using a footswitch connected to the REC jack (or using the front panel REC switch)

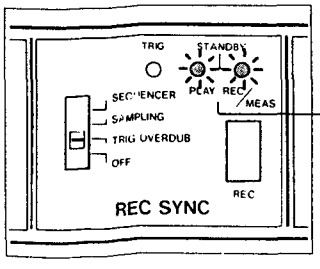
OPERATION

1. To set delay time with a footswitch connect the footswitch to the rear panel REC jack, but do not connect anything to the rear panel TRIG jack.



Footswitch

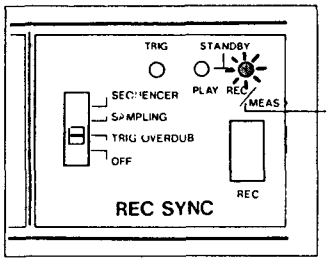
2. Set REC SYNC mode switch to TRIG OVERDUB.



Shows standby.

3. Press REC switch (or footswitch connected to REC jack).

Begins measuring delay time.

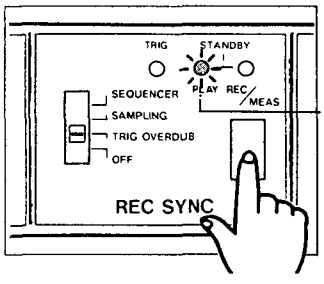


REC/MEAS LED lights up

4. Press REC switch (or footswitch connected to REC jack) again.

Sets end of delay time.

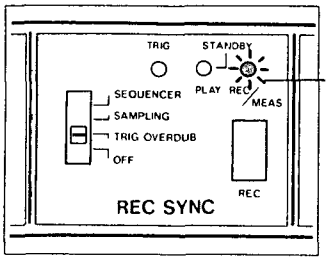
Delay time is set as the time between pressing the REC switch once and then pressing it again. If the time between the two presses is longer than the time selected with the DELAY knob then the SDD-1000 goes back to the condition in step 3, above, waiting for you to set the time again.



Switches to PLAY condition.

- After using TRIG OVERDUB to set the delay time you can use the HOLD function.

5. If you now press the REC switch or footswitch again, you will return to the condition in step 3 where you can then reset delay time.

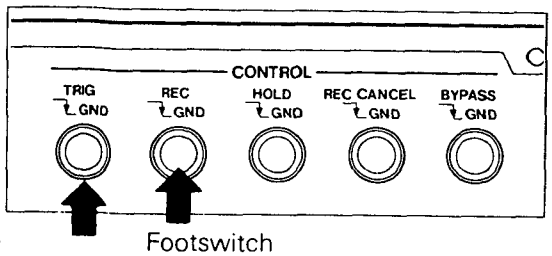


REC/MEAS LED lights up

B Using TRIG OVERDUB with the TRIG jack.

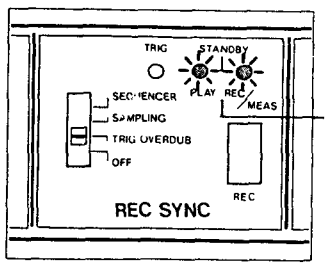
OPERATION

1. Connect drum machine, sequencer, or synthesizer trigger output to SDD-1000 TRIG jack.



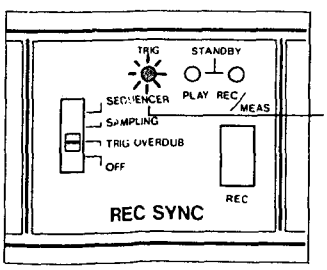
Footswitch
Trigger output from drum machine, sequencer, or synthesizer.

2. Set REC SYNC mode to TRIG OVERDUB.



Indicates standby condition.

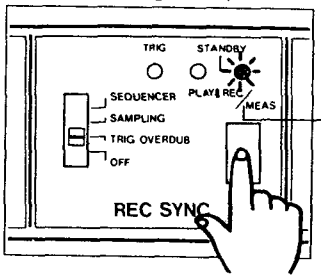
3. Turn on trigger source so that the TRIG jack receives a regular cyclic trigger input.



Lights up
when trigger is received.

4. Press REC switch or footswitch connected to rear panel REC jack.

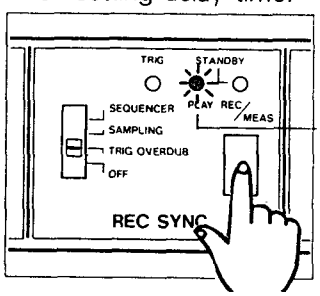
Starts setting delay time.



REC/MEAS LED lights up.

5. Press REC switch again.

Ends setting delay time.



Switches to PLAY condition.

Delay time is set as the interval between the last two trigger signals occuring between one press of the REC switch and the next.

However, if the interval between triggers exceeds the DELAY TIME knob settings, then the delay time will be the same as the front panel setting.

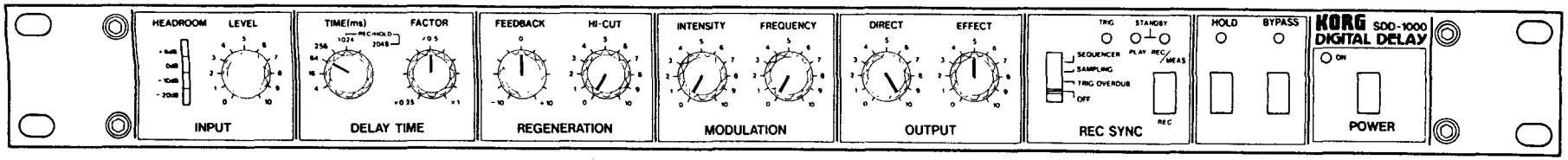
* The HOLD switch can be used to turn the hold function on and off after the delay time has been set with TRIG OVERDUB.

6. If you now press the REC switch or footswitch again, you will return to the condition in step 4 where you can then reset delay time.

NOTE:
Trigger signals sould come at regular intervals and there should be less than two seconds form one trigger to the next.

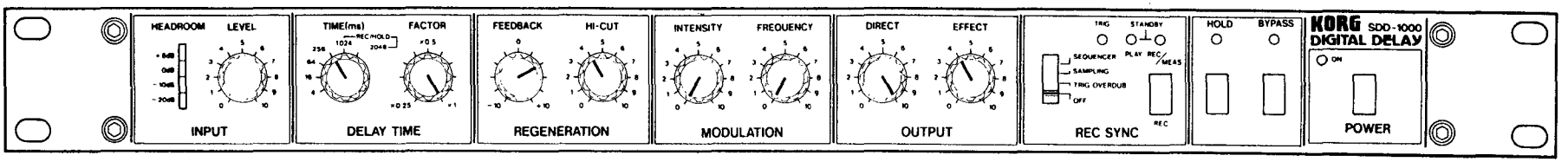
1. Short delay.

For an ordinary delay effect. Adjust FEEDBACK and DELAY TIME to match your requirements.



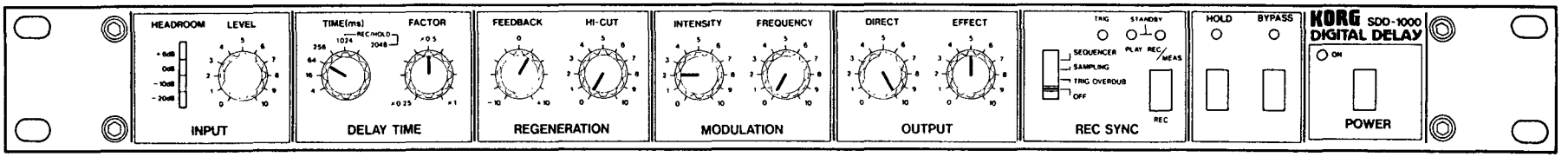
2. Long delay.

For long repeating echos.



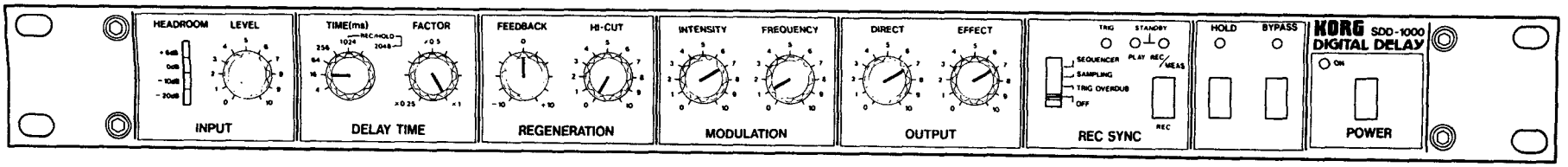
3. Doubling

For doubling effect with guitar chords, strings, vocals, etc., mild vibrato is applied to the delayed signal.



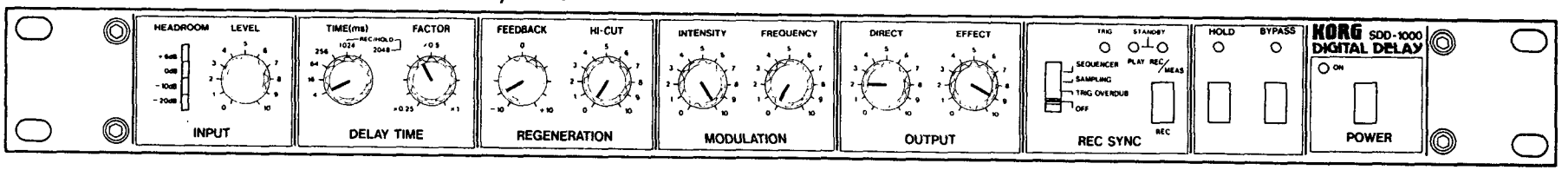
4. Chorus

For a familiar chorus effect. Adjust modulation settings to suit your needs.

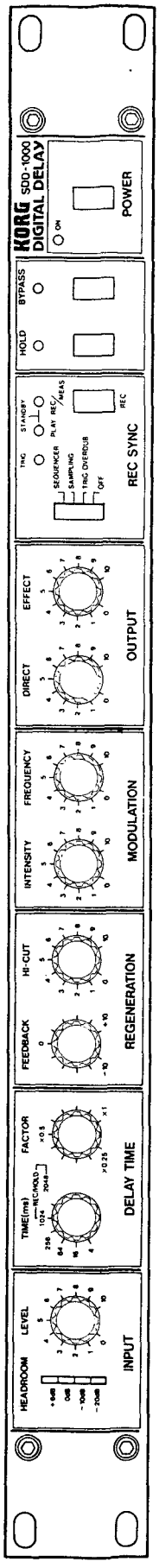


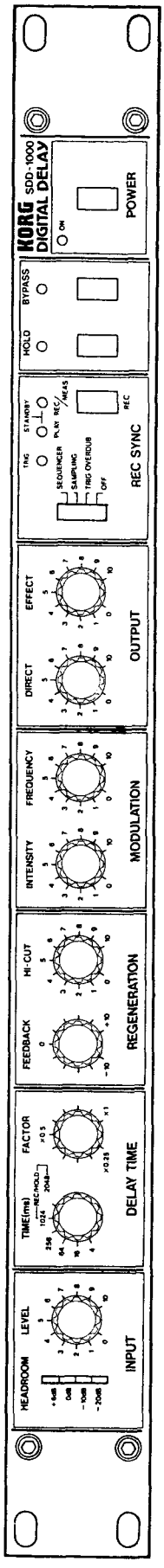
5. Flanging

For flanging effect. Be careful not to set FEEDBACK too high otherwise oscillation may occur.

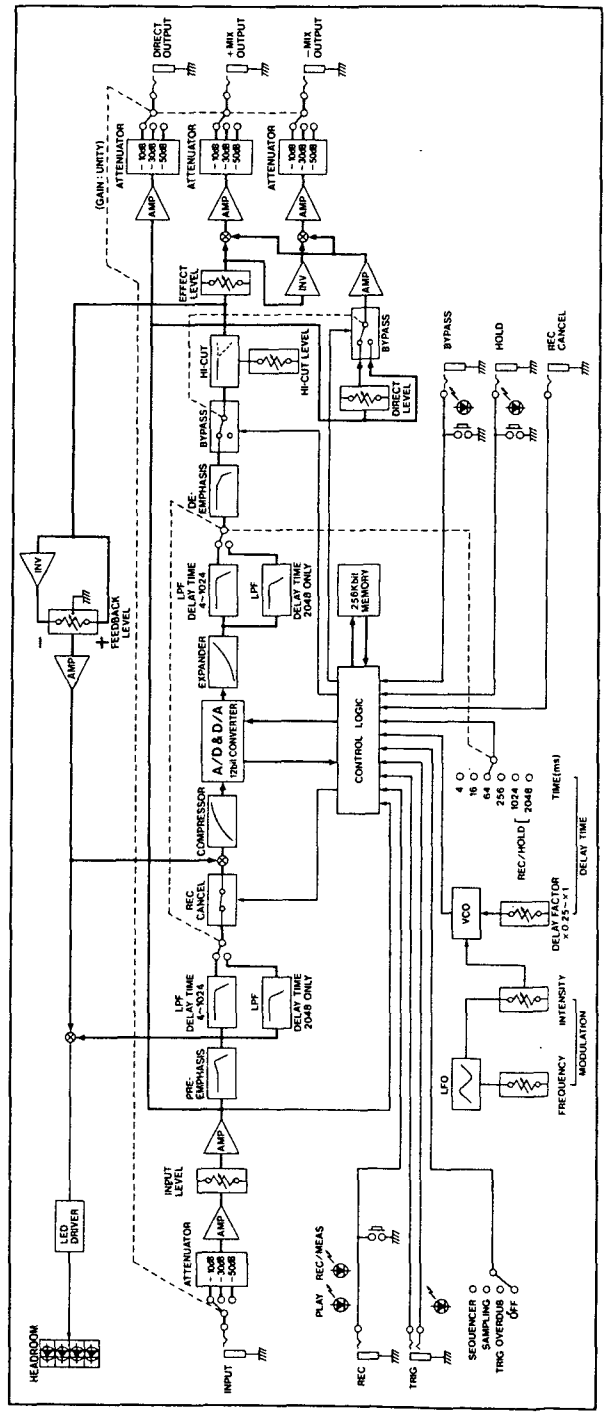


Blank Charts

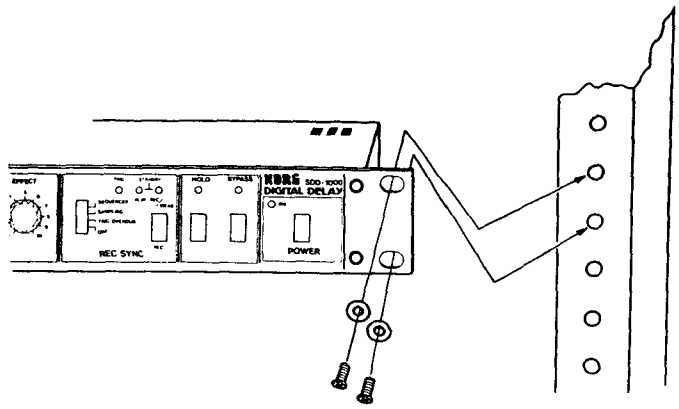




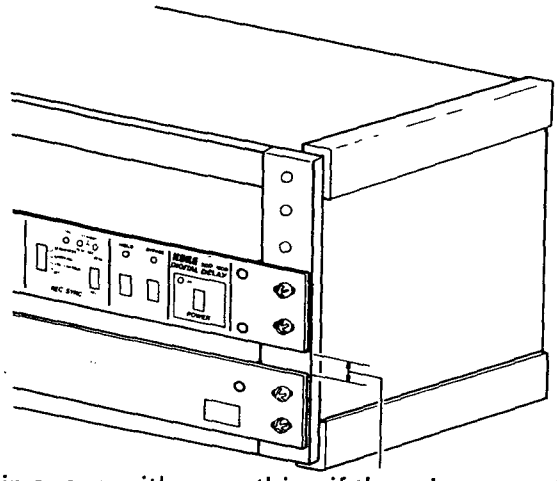
BLOCK DIAGRAM

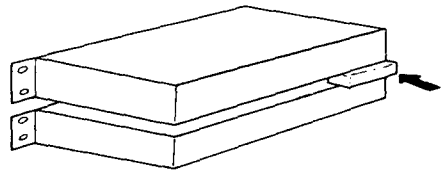


19-INCH RACK MOUNTING PROCEDURE



Use supplied screws to mount on a rack.

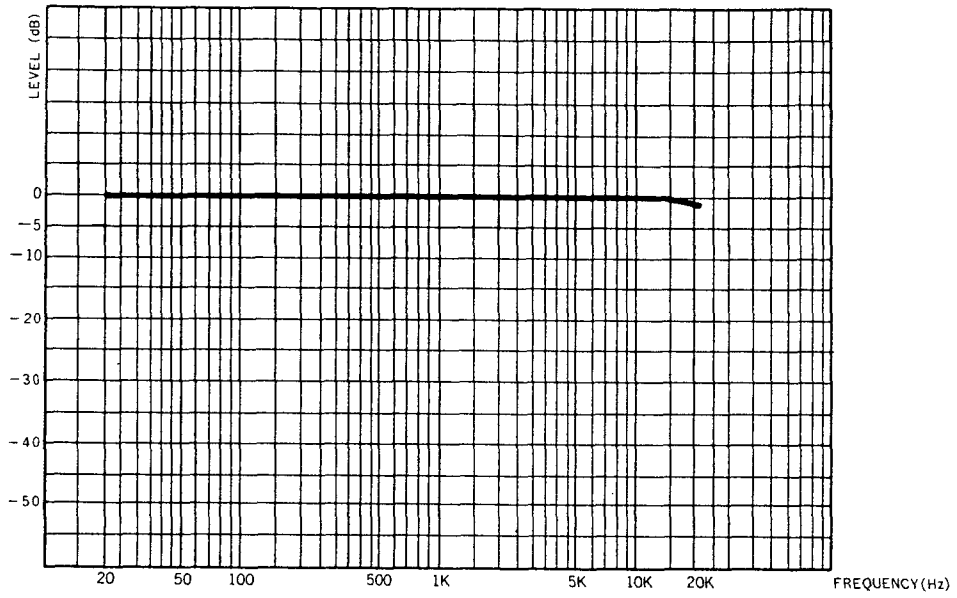




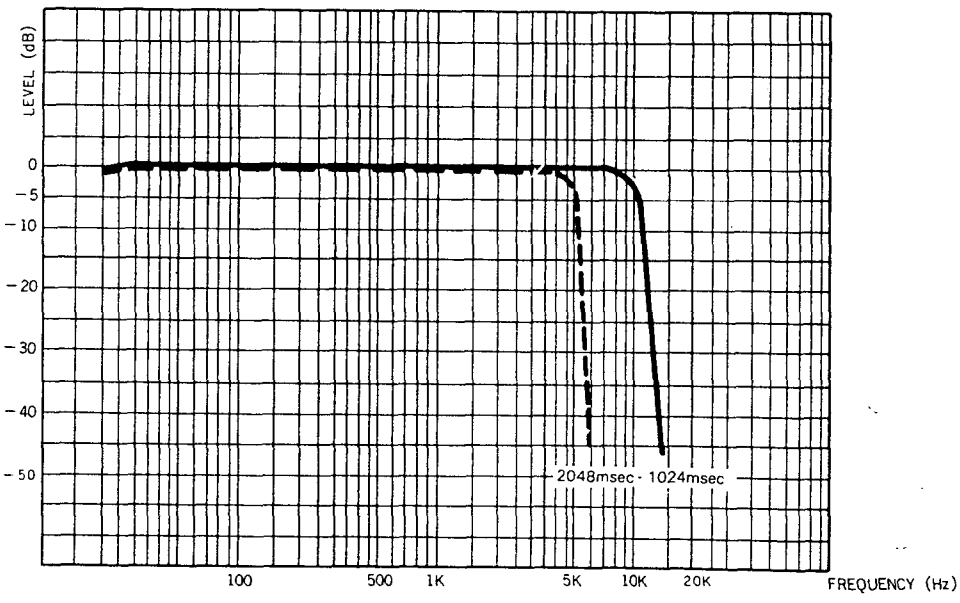
Fill in space with something if there is a gap of more than about 3mm.

FREQUENCY RESPONCE GRAPH

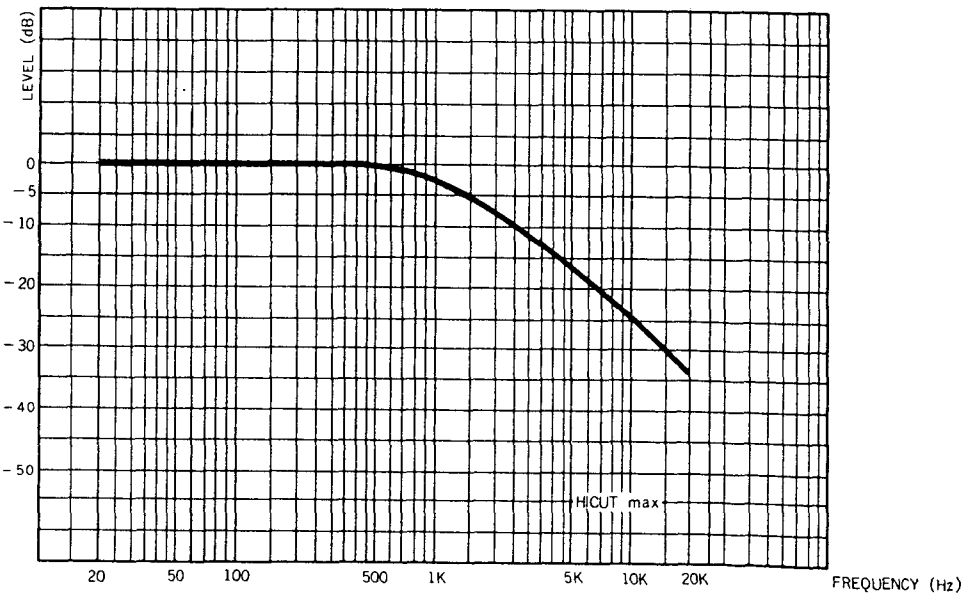
DIRECT OUTPUT



DELAY



HIGH CUT FILTER



SPECIFICATIONS

INPUT	Input Level	Impedance	Max Clip Level
	−50 dBm	5KΩ	−15 dBm
	−30 dBm	50KΩ	+ 5 dBm
	−10 dBm	500KΩ	+19 dBm
OUTPUT (Unity)	Output Level	Impedance	Max Clip Level
	−50 dBm	1KΩ	−35 dBm
	−30 dBm	1KΩ	−15 dBm
	−10 dBm	1KΩ	+ 4 dBm
FREQUENCY RESPONSE	20Hz ~ 20kHz, ~1dB (Direct) 30Hz ~ 10kHz, +1dB, −3dB (Effect) (4, 16, 64, 256, 1024msec Range) 30Hz ~ 5kHz, +1dB, −3dB (Effect) (2048msec Range)		
DYNAMIC RANGE	90dB (IHF), (Effect)		
S/N RATIO	80dB (Effect)		
DISTORTION	0.05% (Direct) 0.1% (Effect)		
HIGH CUT	10kHz 0dB ~ 24dB (Continuous variable)		
DELAY TIME	1msec ~ 2048msec 4, 16, 64 256, 1024, 2048msec (6 position switched) ×0.25 ~ ×1 (Continuous variable factor)		
FEEDBACK	0 ~ 110% (+direction, Positive phase) 0 ~ 110% (−direction, Opposite phase)		
LFO	Waveform: Triangle wave (∧) Modulation frequency: 0.1Hz ~ 10Hz (Continuous variable) Delay time modulation range: 4:1 (INTENSITY MAX)		
DIMENSIONS	44(H) ×482(W)×302(D) mm		
WEIGHT	4.3kg		
POWER SUPPLY	Local voltage		
POWER CONSUMPTION	15W		
ACCESSORIES	Signal code, Rack mounting screws×4		

NOTICE

KORG products are manufactured under strict specifications and voltages required by each country. These products are warranted by the KORG distributor only in each country. Any KORG product not sold with a warranty card or carrying a serial number disqualifies the product sold from the manufacturer's/distributor's warranty and liability. This requirement is for your own protection and safety.