⌐Roland

MIDI DIGITAL DRUMS

DDR-30

Owner's Manual

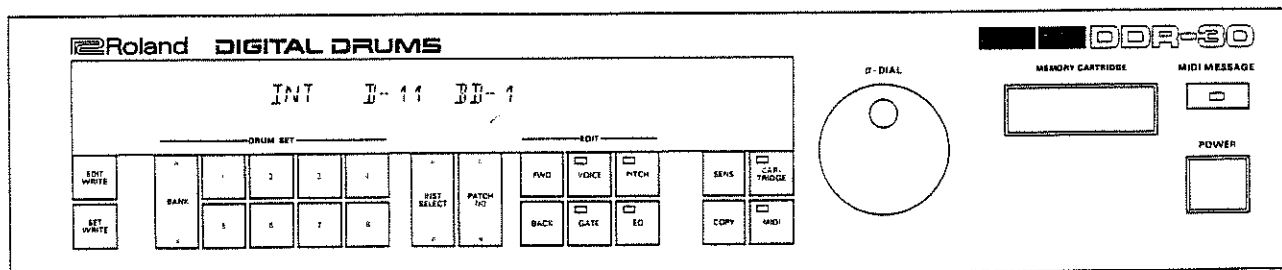⌐Roland DIGITAL DRUMS   DDR-30

FEATURES

The Roland DDR-30 is a MIDI compatible digital drum module. Set up with the drum pad kits — PD-10 Bass Drum Pad and the PD-20 Snare/Tom Pads, it makes a perfect digital drum system.

The DDR-30 features 6 drum voices (Bass, Snare and Toms) and up to 8 different sounds per voice (total of 48 sounds) are preprogrammed ready to be called up by using the 6 drum pads (a Bass, a Snare and four Toms). These preprogrammed sounds can be delicately modified and stored in memory.

To enable the easy and accurate modification of sounds, all the programming is done with the large Alpha Dial, and all programmed data and memory functions are displayed on the front panel.

Using the optional Memory Cartridge M-16C, you can expand the library of the drum sounds.

The DDR-30 can also be used as a drum module for a MIDI sequencer.

IMPORTANT NOTES

- The appropriate power supply for this unit is shown on its name plate. Please make sure that the line voltage in your country meets that.

- Please do not use the same socket used for any noise generating device (such as motor, variable lighting system).

- This unit might not work properly if turned on immediately after turned off. If this happens, simply turn it off and turn it on again a few seconds later.

- Before setting up this unit with other devices, turn all of them off.

- This unit might get hot while operating, but there is no need to worry about it.

- Use a soft cloth and clean only with a mild detergent.

- Do not use solvents such as paint thinner.

- Avoid using this unit in excessive heat or humidity or where it may be affected by direct sunlight or dust.

- Save the necessary data on a cartridge before having the DDR-30 repaired, in case it happens to be accidentally erased.

The equipment described in this manual generates and uses radio-frequency energy. If it is not installed and used properly, that is, in strict accordance with our instructions, it may cause interference with radio and television reception.

This equipment has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J, of Part 15, of FCC Rules. These rules are designed to provide reasonable protection against such an interference in a residential installation.

However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by the following measure:

● Disconnect other devices and their input/output cables one at time. If the interference stops, it is caused by either the other device or its I/O cable.

These devices usually require Roland designated shielded I/O cables. For Roland devices, you can obtain the proper shielded cable from your dealer. For non Roland devices, contact the manufacturer or dealer for assistance.

If your equipment does cause interference to radio or television reception, you can try to correct the interference by using one or more of the following measures:

● Turn the TV or radio antenna until the interference stops.
● Move the equipment to one side or the other of the TV or radio.
● Move the equipment father away from the TV or radio.
● Plug the equipment into an outlet that is on a different circuit than the TV or radio. (That is, make certain the equipment and the radio or television set are on circuits controlled by different circuit breakers or fuses.)
● Consider installing a rooftop television antenna with coaxial cable lead-in between the antenna and TV.

If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find helpful the following booklet prepared by the Federal Communications Commission:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is avilable from the U.S. Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

CONTENTS

Please read the separate volume "MIDI", before reading this owner's manual.

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① PANEL DESCRIPTION

<Front Panel>

❽ Forward Button

❾ Voice Button

❿ Pitch Button

⓮ Sensitivity Button

⓯ Cartridge Button

❶ Display

⓲ Alpha Dial

㉑ MIDI Message Indicator

Roland DIGITAL DRUMS

INT B-11 BD-1

❺ Set Buttons

⓱ MIDI Button

⓴ Power Switch

❹ Bank Button

⓰ Copy Button

⓳ Memory Cartridge Holder

❸ Set Write Button

⓭ Equalizer Button

⓬ Gate Button

❷ Edit Write Button

⓫ Back Button

❼ Patch Number Button

❻ Instrument Button

<Rear Panel>

㊱ Stereo Out Jack (R) / Mono Jack

㊲ Stereo Out Jack (L)

㊳ Multi Out Jacks

㉟ Pad Trigger Input Connectors

㉞ Set Shift Jack

㉝ Bank Shift Jack

㉜ MIDI IN Connector

㉛ MIDI OUT Connector

㉚ MIDI THRU Connector

② CONNECTIONS

To PA, Power Amplifier, etc.   To PA, Mixer, etc

〈Rear Panel〉

*PIN STANDARD

2. COLD   1. GND

3. HOT

Pedal Switches
DP-2
(Optional)

Drum Pads
PD-20
(Optional)

Drum Pad
PD-10
(Optional)

5

3 OPERATION

Connect the DDR-30 as shown on page 5, then turn it on.

1. Drum Set

a. Drum Sounds

<Six Drum Sounds which make
a Drum Set combination>

The DDR-30 features six drum voices (Bass, Snare and Toms) and up to 8 different sounds per voice (total of 48 sounds) are preprogrammed ready to be used. In addition, the unit will memorize up to 32 combinations of the 6 drum sounds (a bass, a snare and four toms).

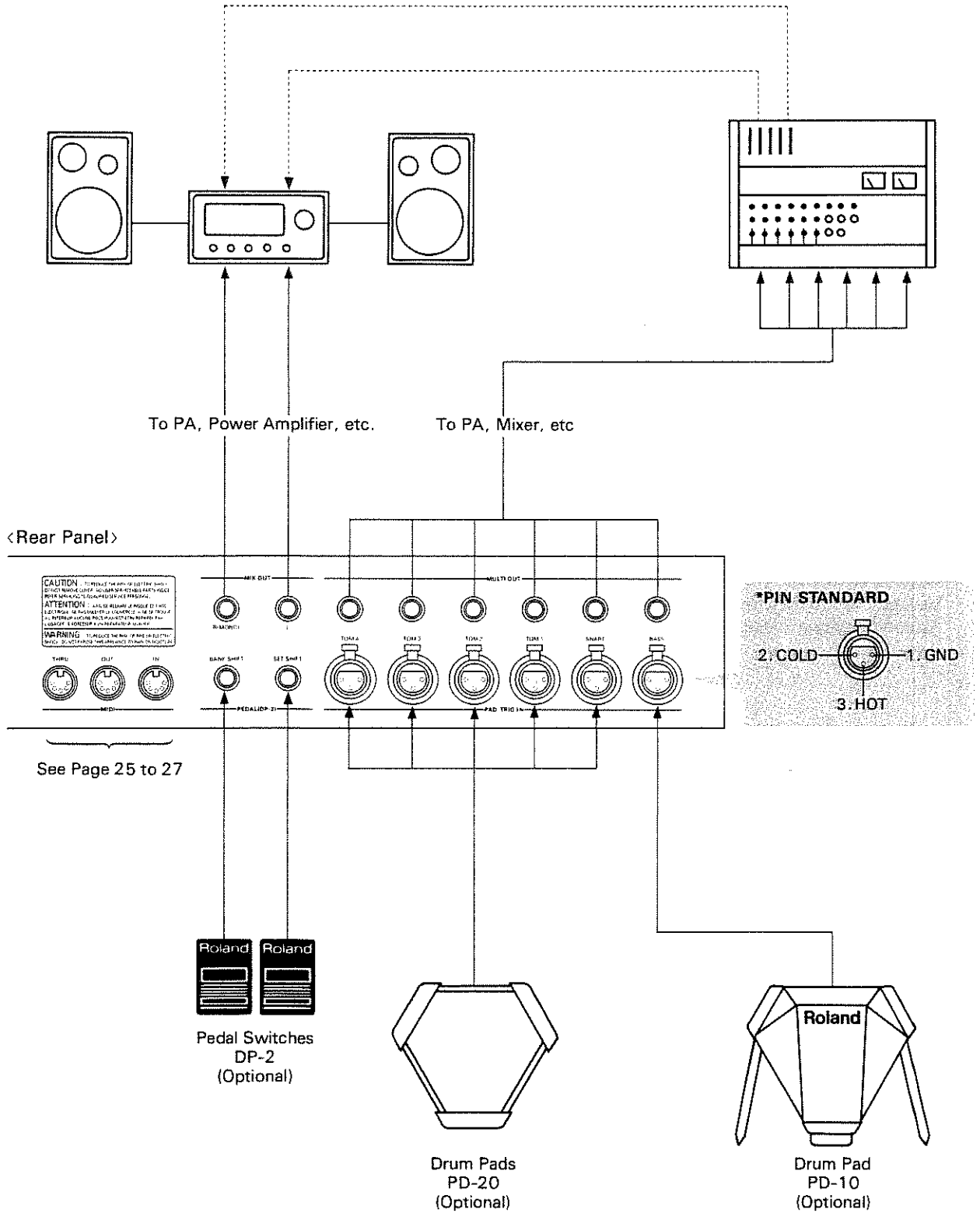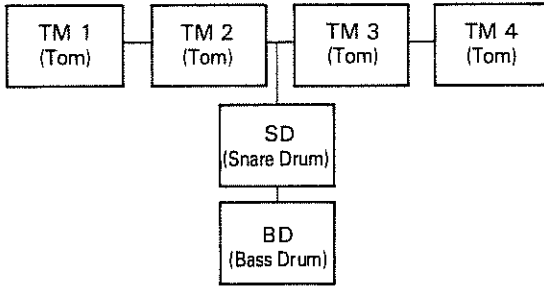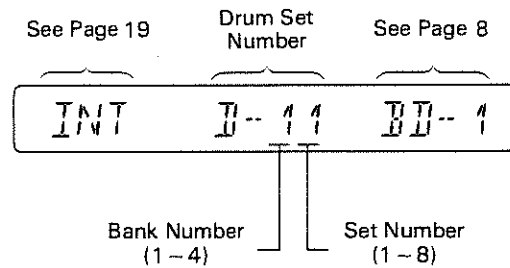The combination of the 6 drum sounds is a drum set in actual drumming. So, in this manual, we call the combination "Drum Set". The memory location where a Drum Set is stored can be assigned by a Bank (×4) and a Set (×8) numbers.

Turning the DDR-30 on will cause the Display ● to respond as shown below.

Jl-- $\mathit{11}$ shown in the center of the Display is the number of the Drum Set. The left number $\mathit{1}$ means Bank number 1, and the right number $\mathit{1}$ means Set number 1. In other words, the Drum Set 1-1 is currently selected ready to be used.

* Play the pads and see how the Drum Set sounds.

<Drum Set Numbers>

Set Bank	1	2	3	4	5	6	7	8
1	11	12	13	14	15	16	17	18
2	21	22	23	24	25	26	27	28
3	31	32	33	34	35	36	37	38
4	41	42	43	44	45	46	47	48

b. Changing the Drum Sets

Any of the 32 Drum Sets can be called up by the following operations.

OPERATION

① **By pushing the relevant Set Button ⑤, select the Set number of the Drum Set you want.**
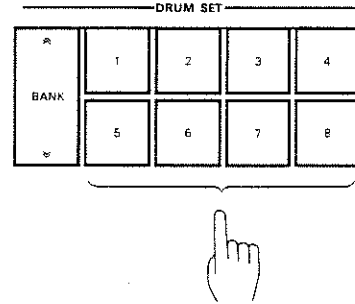
The Display will show the new Set number.

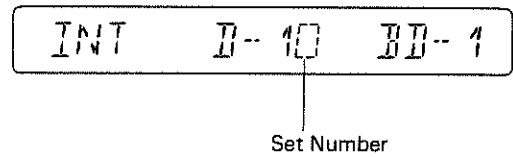② **By using the Bank Button ④, set the Bank number of the Drum set you want.**

Pressing the upper part of the Bank Button will increase the number and the lower part will decrease.
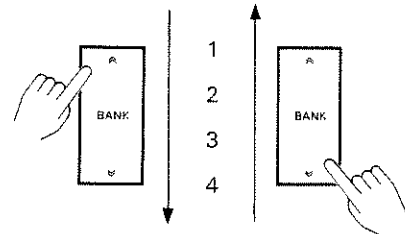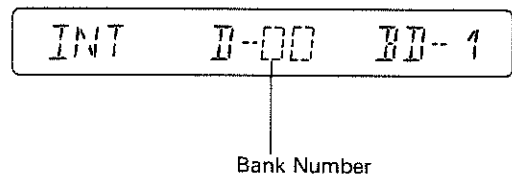
Try various Drum Sets.

①Select the Set Number.

* The Set Number changes.

Set Number

②Select the Bank Number.

* The Bank Number changes.

Bank Number

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c. The sounds of a Drum Set

The DDR-30 features 6 drum voices (Bass, Snare and Toms) and up to 8 different sounds per voice (total of 48 sounds) are preprogrammed ready to be used. However, these preprogrammed sounds can be delicately modified to your taste and stored in memory. (See page 12 "Edit".)

There are 8 bass drum sounds (BD-1 to BD-8), 8 snare sounds (SD-1 to SD-8), and 32 tom sounds (four kinds of TM-1 to 8). We call those numbers 1 to 8 Patch Number.

To see other drum sounds (SD, TM1 to TM4) in the same Drum Set, take the following operation.

OPERATION

① **Press either side of the Instrument Button ⑥.**

Pressing the upper side of the button will change the Display like BD → SD → TM1 → TM2 → TM3 → TM4 → BD...., and pressing the lower side will make it the other way round.
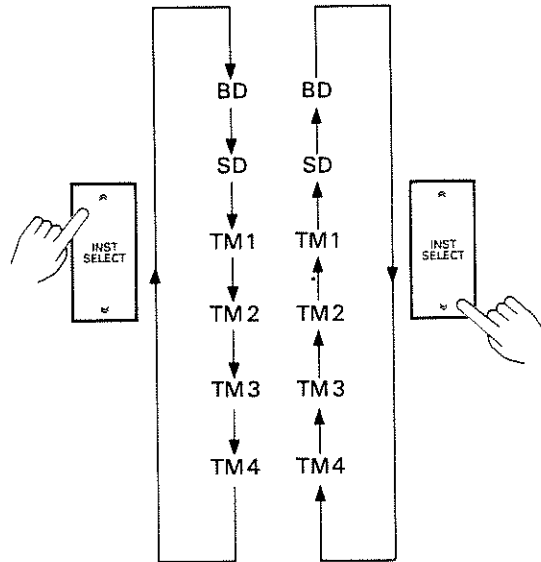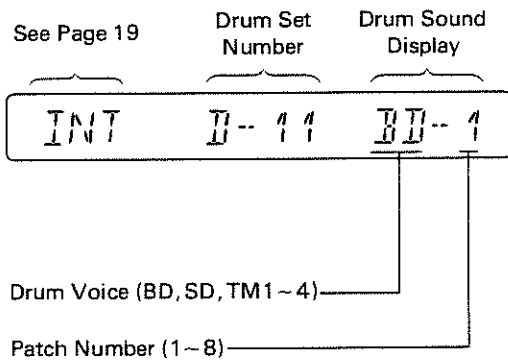
When the DDR-30 is switched on, $BD\text{-}1$ is shown at the right of the Display, and as mentioned before, the center of the Display shows $D\text{-}11$. This means that the Drum Set 11 is ready to be used, and the Patch number of the bass drum sound used in the Drum Set 11 is BD-1 (Bass Drum 1).

* To see the drum sounds in the different Drum Set, first assign the Drum Set number using the Set Button ⑤ and the Bank Button ④, then take the above procedure ①.

d. 8 Drum Sounds of each Drum Voice

Now, let's call the 8 different preset drum sounds of each drum voice respectively.

When you switch the DDR-30 on, the Bass Drum is ready to be called.

OPERATION

① **Push either upper or lower side of the Patch Number Button ❼.**

<To listen to each Snare drum sound (1 to 8)>

● Select "SD" by using the Instrument Button.
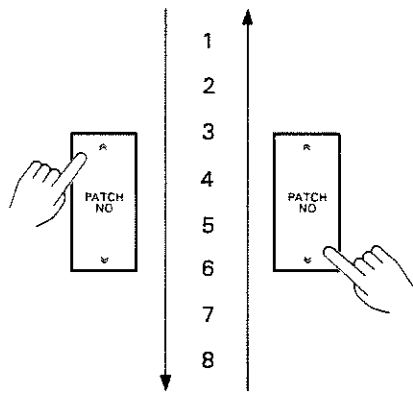
Pushing the upper side will change the Patch number in the Display 1 towards 8 sequentially. Pushing the lower side will make the change the other way round.
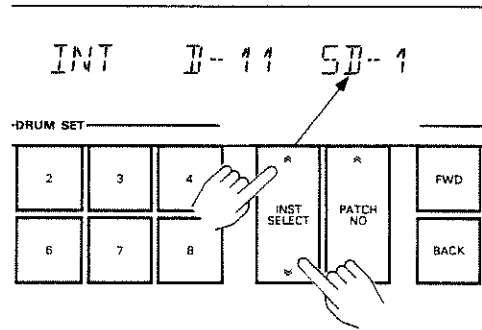
● Select each Patch Number while listening to the snare drum sound.

While actually playing the pad of the bass drum, repeat the above operation and see how the bass drum sounds.

* The drum sounds of the snare drum and the tom can also be heard. First, select the drum sound you want by using the Instrument Button ❻.
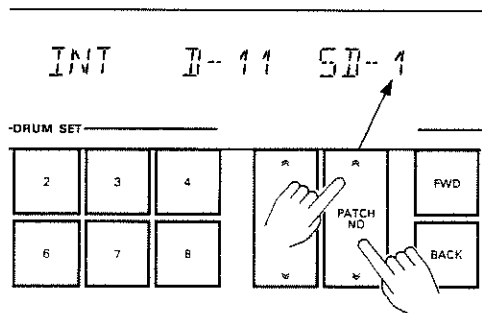
e. Changing the Drum Set Combinations

You can change the combination of the six drum sounds in a Drum Set.

OPERATION

① **Call the Drum Set which you wish to change the combination of by using the Set Button ❺ and the Bank Button ❹.**

Now, at the center of the Display, the Drum Set number you have called is shown, e.g. $3\text{-}22$.

② **Call the drum voice you wish to change by using the Instrument Button ❻.**

Now, at the right of the Display, the drum voice you have called and the Patch number of that drum sound are shown, e.g. $53\text{-}1$.

③ **Using the Patch Number Button ❼, and with the aid of the Display window, change to the Patch number of the drum sound you like.**

Now, the Set number of the Drum Set start flashing in the Display. Flashing means a new drum sound is called, but not yet written in memory. To write the new drum sound into memory, go to the following procedures.

④ **Push the Set Write Button ❽.**

The flashing changes to steady glowing, showing the new sound is now written into memory.

⑤ **To change the sounds of other drum voices, repeat the procedures ② to ④.**

## f. Calling a Drum Set with the Pedal Switches

Simply connect two optional pedal switches DP-2's to the Bank Shift Jack ㉝ and the Set Shift Jack ㉞, and you can call any preset Drum Set by pressing the pedal.

㉝ Bank Shift Jack   ㉞ Set Shift Jack

The Bank Number is shifted one by one.   The Set Number is shifted one by one.

Pedal Switches
DP-2
(Optional)
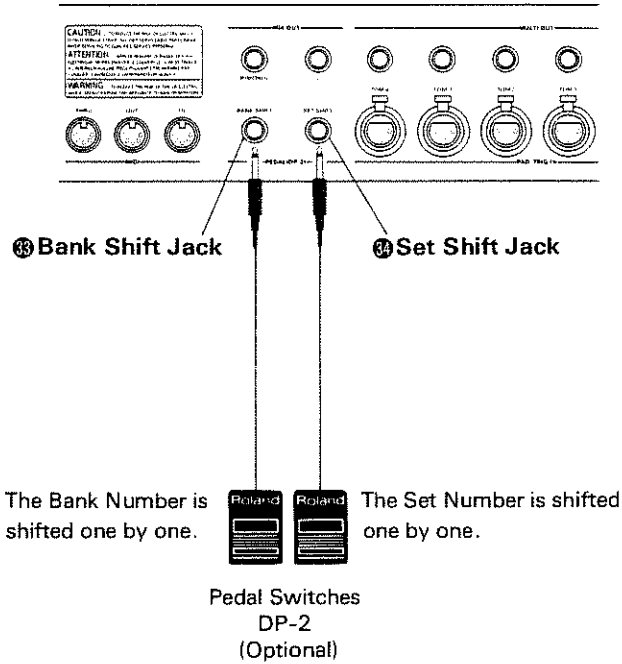
Pressing the pedal connected to the Bank Shift Jack will advance one Bank number, and pressing the one connected to the Set Shift Jack will advance one Set number.

<To change the snare drum of Drum Set 28 (to SD-4)>

① Select the Drum Set 28.

② Select the drum voice you want (=Snare Drum).

③ Change to the Patch number you want (=4).
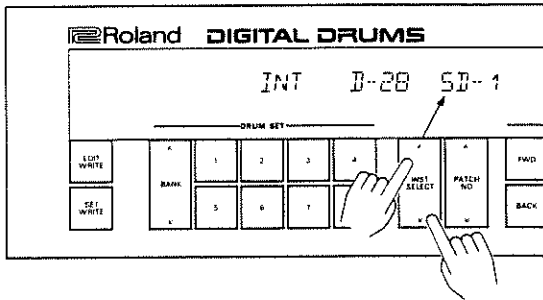
④ Press the Set Write Button ❸.

11
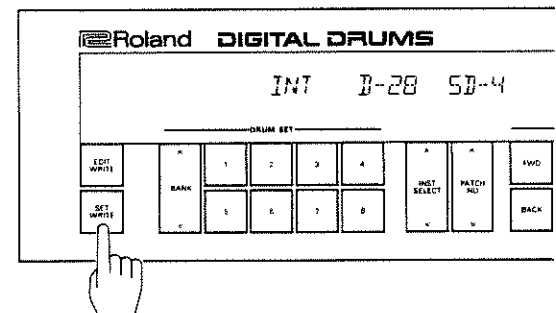
2. Edit

8 different drum sounds are preprogrammed for
each drum voice (Bass, Snare and Toms) in the
DDR-30's memory. All of these 48 sounds can be
modified to your taste.

A drum sound consists of 16 parameters which
can be respectively edited with the Alpha Dial ⑱.
These 16 parameters are divided into 4 groups;
Voice, Pitch, Equalizer and Gate as shown below.

Group	Display	Parameter	Variable Range	Ref.
VOICE	SOURCE No	SOURCE NUMBER	1 to 4	15
	LEVEL	LEVEL	0 to 99	
	ENV DCAY	ENVELOPE DECAY	1 to 99	
	ATTACK	ATTACK	0 to 99	
	ATK DCAY	ATTACK DECAY	1 to 99	
PITCH	PITCH	PITCH	−24 to +24	15
	BENDDPTH	BEND DEPTH	0 to 99	
	BENDDCAY	BEND DECAY	1 to 99	
	DYN SENS	DYNAMICS SENSITIVITY	0 to 99	
EQ	TREBLE	TREBLE	−6 to +6	16
	BASS	BASS	−6 to +6	
GATE	G LEVEL 1	GATE LEVEL 1	0 to 99	16
	G TIME	GATE TIME	0 to 99	
	G RLEAS 1	GATE RELEASE 1	1 to 99	
	G LEVEL2	GATE LEVEL 2	0 to 99	
	G RLEAS2	GATE RELEASE 2	1 to 99	

a. Editing Parameters

OPERATION

① **Call the drum sound you wish to edit by using the Instrument Button ⑥ and the Patch Number Button ⑦.**

② **Push the Edit Button (Voice ⑨, Pitch ⑩, GATE ⑫ or EQ ⑬) which includes the parameter to be edited.**

The corresponding indicator will light up, and now the DDR-30 is in the Edit mode. Meanwhile, the Display shows the name of the first parameter in the selected group, and its value.

③ **By using the Forward Button ⑧ and the Back Button ⑪, call the parameter you wish to edit. If you wish to edit the first parameter in the group, you can skip this procedure.**

Pushing the Forward Button ⑧ calls the next parameter, and pushing the Back Button ⑪ backs one up.

④ **Play the relevant pad, and edit the sound by rotating the Alpha Dial.**

The parameter value shown at the right of the Display will change to a flashing number. This means the parameter value is changed but not yet written into memory.

⑤ **If you wish to edit the parameters in this group, repeat the procedures ③ and ④.**

⑥ **When you have finished editing, push the same Edit Button you pushed in the procedure ②.**

The Edit mode is now cancelled. At the right of the Display, the patch number of the drum sound you have just edited will flash.

* If you wish to edit the parameters of other group, go back to the step ②.

NOTE

This editing operation does not automatically rewrite the existing drum sound. To write the edited sound into memory, take the following Writing operation.

b. Write

The edited sound will be erased if you call other sound or other Drum Set. To retain the edited sound, appropriate writing operation is required.

OPERATION

When editing is completed, press the Edit Write Button ❷.

The flashing Patch number in the Display will now glows steadily.

---

① Select the drum sound you wish to edit.

$$INT \quad D\text{-}11 \quad SD\text{-}2$$

② Press the Edit Button.

$$SD\text{-}2 \; SOURCE \; No \; 1$$
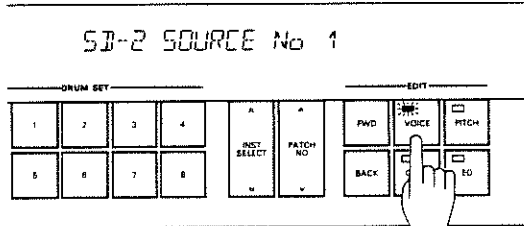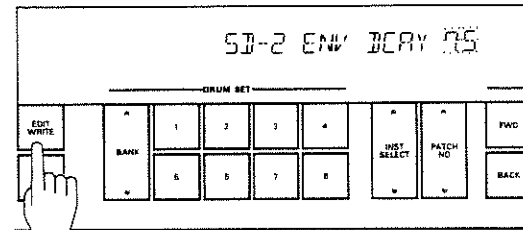
③ Select the parameter whose value you wish to change.

$$SD\text{-}2 \; ENV \; DCAY \; 50$$

④ Change the value you like.

σ·DIAL

flashing

$$SD\text{-}2 \; ENV \; DCAY \; 75$$

* Press the Edit Write Button ❷ .

$$SD\text{-}2 \; ENV \; DCAY \; 75$$

glowing steadily

$$SD\text{-}2 \; ENV \; DCAY \; 75$$
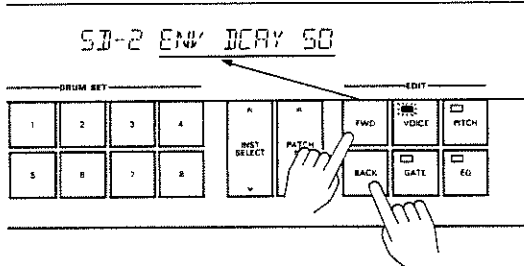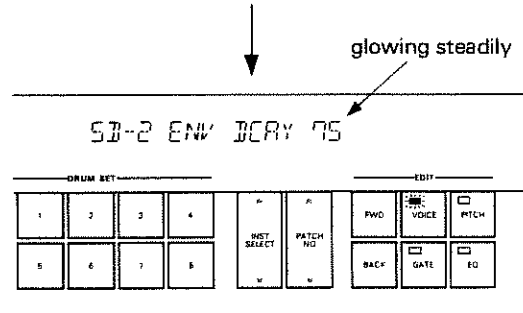
* Writing is completed.

c. Parameters

VOICE GROUP

| VOICE | The parameters in this group can change the volume and the sensitivity of dynamics. |

Source number

$$SOURCE \ No \quad 1-4$$

1. This is the parameter that selects one of the four digital drum sounds (Sources) provided for each drum voice. The sound selected here can be edited by changing the values of the following parameters.

Level

$$LEVEL \quad 0-99$$

2. This adjusts the volume of the sound. The volume of each drum sound in a Drum Set combination needs adjsuting to even the volume difference. At value of 0, there is no sound produced, and towards 99, the higher sound is produced.

Envelope Decay

$$ENV \ DCAY \quad 1-99$$

3. This sets the time required for the sound note to fade out (= decay time).

Attack Level

$$ATTACK \quad 0-99$$

4. This sets the highest level to which a note can reach. In other words, weaker or stronger attack can be selected. When the pads are played gently, there is no attack obtained whatever value is set here.

Attack Decay

$$ATK \ DCAY \quad 1-99$$

5. This sets the decay time of the attack sound.

PITCH GROUP

| PITCH | The parameters in this group decide the pitch, the sensitivity of the pitch bend effect. |

Pitch

$$PITCH \quad -24-+24$$

1. This sets the pitch for each drum sound. Variable from −24 to +24 within two octaves.

Bend Depth

$$BENDDPTH \quad 0-99$$

2. This sets the sensitivity of the pitch bend effect. At "0", there is no pitch bend effect obtained, and towards "99", effect becomes deeper. When the Pitch value is "−24", however, there is no pitch bend effect regardless of the value of the bend depth.

Bend Decay

$$BENDDCAY \quad 1-99$$

3. This adjusts the time needed for the pitch to come down to the set depth of the bend depth (= pitch bend speed). At "1" the speed is fastest and towards "99", slower pitch bend effect is obtained.

Dynamics Sensitivity

$$DYN \ SENS \quad 0-99$$

4. This sets the sensitivity of the pitch bend effect. As the value is increased, the sensitivity is emphasized, that is, deeper pitch bend is obtained by harder hit on the pads.

EQUALIZER GROUP

EQ	The parameters in this group can adjust the tone of each voice.

Treble

TREBLE	-6~+6

1. This parameter cuts or boosts higher frequencies. At "0", flat characteristic is obtained (towards +6: boosted, −6: cut).

Bass

BASS	-6~+6

2. This parameter cuts or boosts lower frequencies. At "0", flat characteristic is obtained (towards +6: boosted, −6: cut).

GATE GROUP

GATE	The parameters (Gate 1 and 2) in this group can create signal gate effect that is a sudden cut of a sound.

Gate 1

The gate effect can be obtained only when the pad is hit harder than a certain level. Also, the sound can be sustained as long as you like.

Gate 2

The gate effect can be obtained in whatever manner you play the pads. Unlike Gate 1, the sound cannot be sustained.

GATE GROUP

Gate Level 1

G LEVEL 1	0-99

1. This parameter sets the volume needed to obtain the Gate 1 effect. At 0, no effect is obtained, and "99" is the maximum volume.

Gate Time

G TIME	0-99

2. This sets how long the sound should be sustained. The volume of the sustained sound is what set with the Gate Level 1.

Gate Release 1

G RLEAS 1	1-99

3. This sets the time needed for the Gate 1 sound to finally fade out.

Gate Level 2

G LEVEL2	0-99

4. This sets the level at which the Gate 2 effect begins. The value should represent the percentage to the initial level.

Gate Release 2

G RLEAS2	1-99

5. This sets the time needed for the Gate 2 sound to finally fade out.

*Gate 1

G. LEVEL 1

ENV DECAY

G. TIME | G. RELEASE 1

* Gate effect is not
obtained at low
output level.

ENV DECAY

*Gate 2

G. LEVEL 2

G. LEVEL 2

G. RELEASE 2

G. RELEASE 2

ENV DCAY

ENV DECAY

17
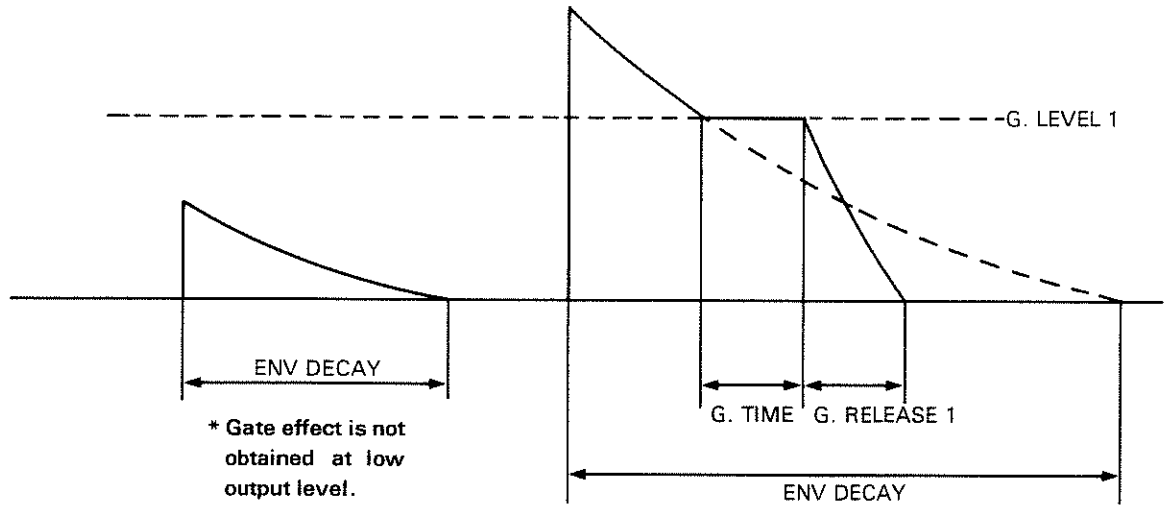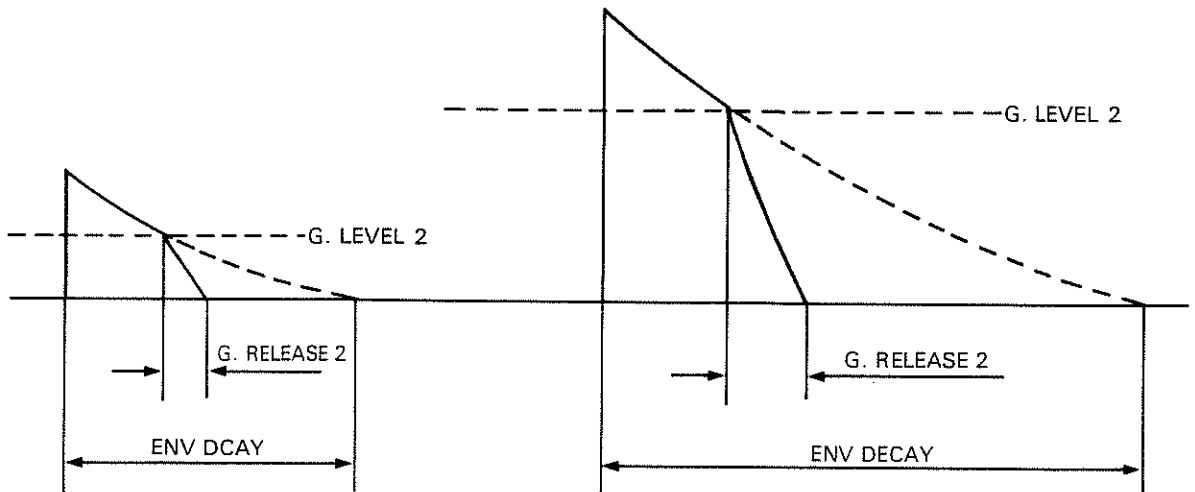
3. Memory Cartridge

Using the optional memory cartridge M-16C, the 32 Drum Set combinations can be expanded up to 96, increasing the drum sounds up to 144.

One memory cartridge has the capacity twice as much as the internal memory of the DDR-30. In other words, one memory cartridge consists of the two areas A and B, and each area can retain up to 32 Drum Set combinations and 48 drum sounds.

a. Attaching the Memory Cartridge

OPERATION

① **Make sure that the Protect Switch on the Memory Cartridge is set to the ON position.**

② **With the Protect Switch of the Memory Cartridge facing upward, securely connect the Memory Cartridge to the Cartridge Holder ⑲ on the DDR-30.**

● Protect Switch
  Normally, set this switch to the ON position to protect the data from accidental loss. And set this to the OFF position when writing Drum Sets or Drum Sounds into cartridge memory.

Protect Switch
ON
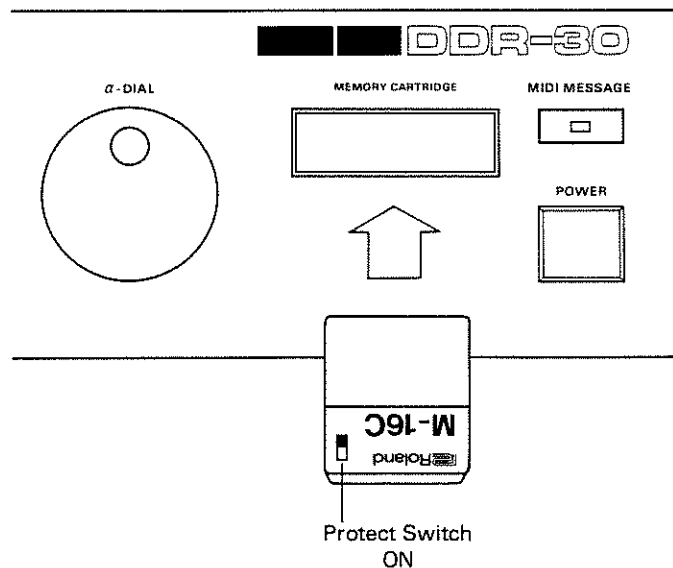
b. Changing the Memories (Internal, Cartridge A, Cartridge B)

When the power is first applied to the DDR-30, the Internal memory is automatically selected. This can be seen in the Display with the letters "INT". To use the memory of the Cartridge, take the following operation.

Memory Area Display   Drum Set Number   Drum Sound Display

INT ········ Internal Memory
CRT-A ····· Cartridge A
CRT-B ····· Cartridge B
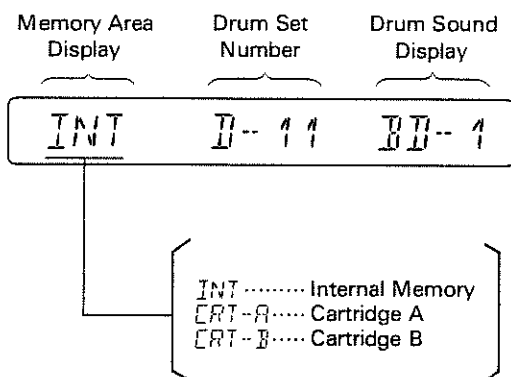
OPERATION

① **Securely connect the Memory Cartridge as instructed on page 18.**

② **Push the Cartridge Button ⑮.**

The indicator of the Cartridge Button will light up, and the left of the Display will change from " INT " to " CRT-A ", showing that Cartridge memory A can be now in use. To change to the Cartridge memory B, rotate the Alpha Dial. Rotating it clockwise will select B, and counterclockwise will select A.
The Cartridge memories A and B work just like the internal memory.

* To return to the Internal Memory mode, simply push the Cartridge Button ⑮.

①Insert the Memory Cartridge securely.

Protect Switch
ON
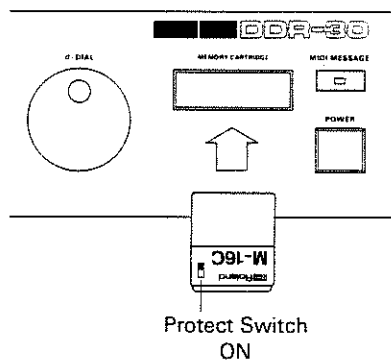
②Push the Cartridge Button ⑮.
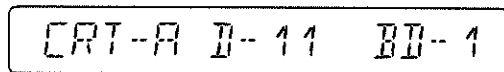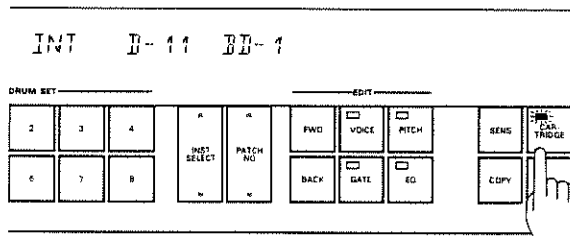
⑱ Alpha Dial
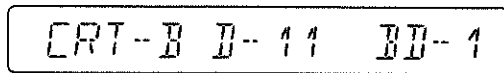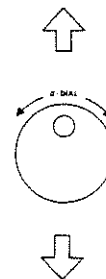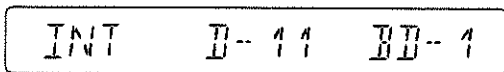
⑮ Cartridge Button

c. Loading from the Memory Cartridge to Internal Memory

It is possible to load the entire memory of Cartridge A or B into the Internal memory of the DDR-30.

OPERATION

① **Push the Cartridge Button ⑮.**

The left of the Display change from " INT " to " $CRT-R$ ". If you wish to load the memory of the Cartridge B, rotate the Alpha Dial clockwise.

② **By using the Forward Button ⑧ or Back button ⑪, get " $CRRTRIDGE-LORD$ " in the Display. (See the picture below.)**

③ **Push the Cartridge Button ⑮.**

When the loading is completed, the indicator of the Cartridge Button goes out, and the Display will return to the usual condition.

d. Saving from the Internal Memory to the Memory Cartridge

It is also possible to save the entire date on the Internal memory of the DDR-30 to the Memory Cartridge.

OPERATION

① **Push the Cartridge Button ⑮ to call the Cartridge memory.**

If you wish to save the data to the Cartridge B, select B by using the Alpha Dial

② **By using the Forward ⑧ or the Back Button ⑪, cause the Display to show " $CRRTRIDGE-SRVE$ ". (See the picture below.)**

③ **Set the Protect Switch on the Memory Cartridge to the OFF position.**

④ **Push the Cartridge Button ⑮.**

When the saving is completed, the display returns to the usual indication.

⑤ **Return the Protect Switch on the Memory Cartridge to ON.**

Try playing both INT and CRT-A (or CRT-B), and confirm that loading or saving is successfully done.

20
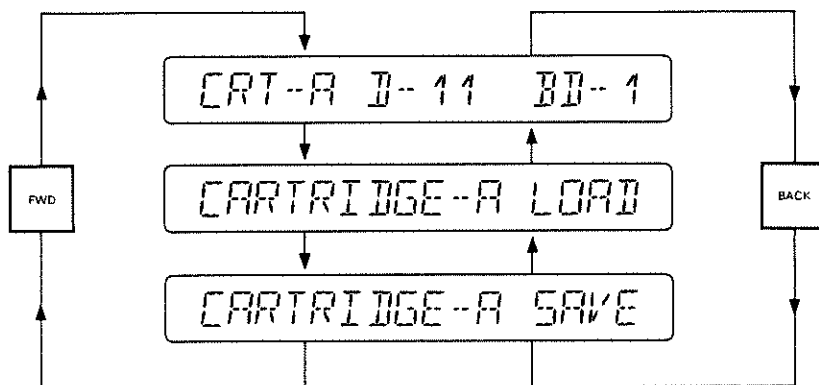
4. Other Useful Functions

a. Returning to the Basic Sound by Removing Effects

The preprogrammed drum sounds of the DDR-30 take on various effects such as Pitch Bend, Equalizer and Gate, etc. The DDR-30, however, features the function to remove all these effects and return to the basic sound without any effect. This function is useful when you particularly want the basic sound for editing from the beginning.

OPERATION

① Call the drum sound from which you wish to remove all the effects applied, by using the Instrument Button ❻ and Patch Number Button ❼.

② Hold the Voice Button ❾ down for about four seconds.

The Display shows Edit mode indication (SOURCE No.) for a few seconds then returns to the usual indication. This means that the Basic sound has replaced the drum sound you called in the step ①.

①Call the drum sound.

INT   B-11   SB-2
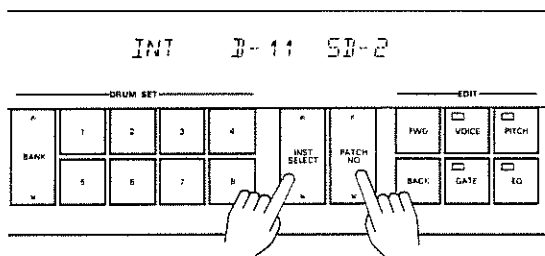
②Hold the Voice Switch ❾ down for about 4 seconds.

b. Calling the Factory Preset

In the memory of the DDR-30, 32 Drum Set combinations are preprogrammed. We call the entire data "Factory Preset", and this can be recalled at any time by a simple operation.

As you write an edited sound or new combination of Drum Set, the preprogrammed sound or Drum Set of the Factory Preset will be inevitably erased. Later, however, you may want to call back the Factory Preset in its complete from. If so, take the following operation.

OPERATION

① Turn the DDR-30 off.

② While holding the Set Switch ① down, turn the unit on.

* This operation recalls the whole Factory Preset, but the data you have programmed previously will be all erased. If you wish to retain the programmed data, save it to the Memory Cartridge as instructed on page 20 before calling the Factory Preset.

In the step ②, by pressing the button of ② ③ or ④ instead of ①, a part of Factory Preset can be recalled as shown below, the irrelevant part of the Internal memory will remain intact.

②: Drum Set Combination and all the Parameter Data except the sensitivity and MIDI
③: Sensitivity Data
④: MIDI Data
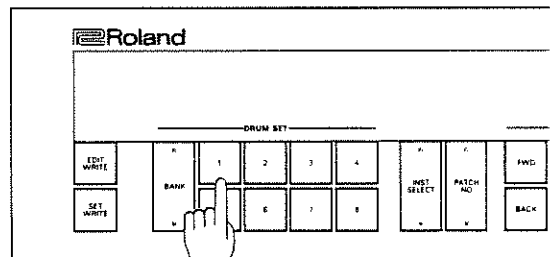
While holding this Button down ...

Power ON ⁄

21

C. Copy

The Copy function of the DDR-30 is useful for when you want to use a drum sound which is located in a different Memory area. For instance, if the DDR-30 is in the Internal Memory mode, but you want a drum sound on the Memory Cartridge for making a Drum Set combination, copy the sound you want to use from the Cartridge to the Internal memory.

OPERATION

① **Call the Memory area (Internal, Cartridge A or B) which contains the drum sound you want to use, then call the relevant drum sound.**

② **Push the Copy Button ⑯.**

The Display will respond as shown below, and the DDR-30 is now in the Copy mode.

```
COPY CRT-B SD-4
```
              | | |
              | | Drum Sound Display
              | Memory Area Display
              Copy indication
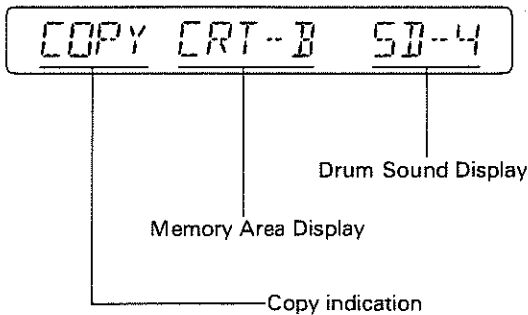
③ **Using the Cartridge Button ⑮ and the Alpha Dial ⑱ call the Memory Area where you wish to make a combination of Drum Set.**

The center of the Display will change to the relevant Memory area.

④ **By using the Patch Number Button ❼, call the Patch number which is the new location for the drum sound you have selected in the step ①.**

The indication at the right of the Display changes.

If the Cartridge memory is selected in the step ③, set the Protect Switch on the Memory Cartridge to the OFF position.

⑤ **Push the Copy Button ⑯.**

When the copy is successfully done, the Display returns to that of the step ①.

Return the Protect Switch to the ON position.

* If you by mistake push the Copy Button ⑯, or wish to cancell the Copy mode while in copying, press any of the Edit Buttons (Voice/Pitch/Equalizer/Gate).

This Copy function is available within the same Memory area. For example, if you wish to edit a drum sound and keep both the original sound and the edited one, initially copy the original sound, which makes two of the same sounds in memory. Then edit and write the sound. In this way, the original sound is retained intact, the step ③ is not necessary, but if the Cartridge memory is in use, be sure to move the position of the Protect Switch as required.

① Call the drum sound you want to use.

INST SELECT | PATCH NO | CAR.
TRIDGE

SD   4   Cartridge B

⮕ [CRT-B D- 11   SD-4]

② Push the Copy Button ⑯.

COPY

⮕ [COPY CRT-B   SD-4]
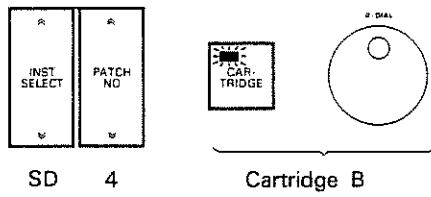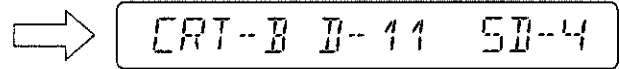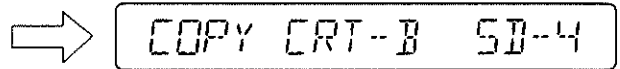
③ Change to the new memory area.

Cartridge A

⮕ [COPY CRT-A   SD-4]
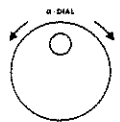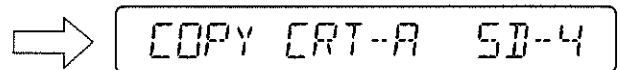
④ Select the new location.

PATCH NO

2

↓

PROTECT OFF

⮕ [COPY CRT-A   SD-2]

⑤ Push the Copy Button ⑯.

COPY

↓

PROTECT ON ∕

⮕ [CRT-B D- 11   SD-4]
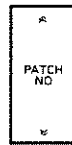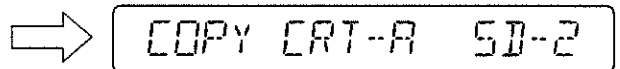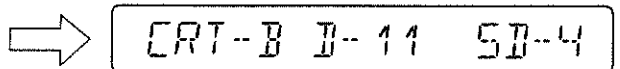
d. Adjusting the Sensitivity

The DDR-30 features the Dynamics sensitivity which is adjustable from 0 to 20 individually in each pad (BD, SD, TM1 to TM4). With the sensitivity set to 0, there is no sound obtained how hard you play the pad. At the maximum value of 20, even gentle hitting will make big sound.

OPERATION

① **Using the Instrument Button ⑥, call the drum voice whose dynamics sensitivity you want to change.**

② **Push the Sensitivity Button ⑭.**

The Display will change as shown right, and now you can adjust the sensitivity to your taste.

③ **As you play the relevant pad, rotate the Alpha Dial ⑮.**

Rotating the dial clockwise will emphasize the sensitivity, and counterclockwise will reduce it.

④ **Push the Sensitivity Button ⑭.**

The Display now returns to the usual indication.

* The sensitivities of all the voices are set to "15" from the manufacturer.

① Call the drum Sound.

② Push the Sensitivity Button ⑭.

Drum Voice | Current value
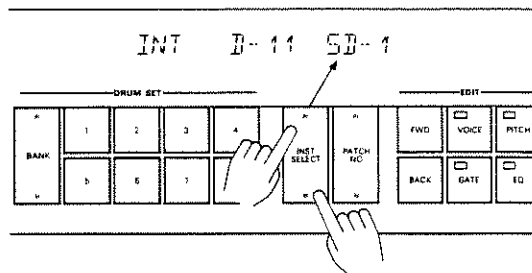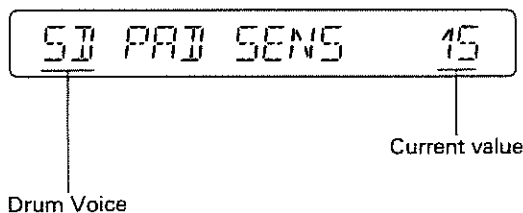
③ Set the value you like while playing.

0 ~ 20
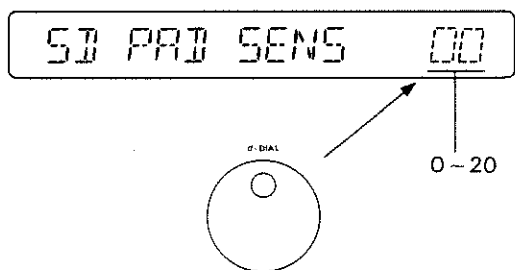
④ Push the Sensitivity Button ⑭.
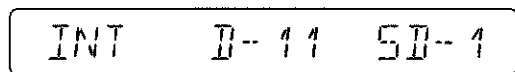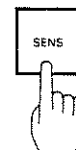
4 APPLICATIONS

1. Example Setups

The DDR-30 can be set up with various MIDI devices other than the Drum Pads, and work excellently as a digital drum module.

a. Setup with a keyboard recorder

Using the MIDI Cables (MSC-15, 25 or 50), connect the MIDI IN's and MIDI OUT's as shown in the below picture. Now, the rhythm played on the DDR-30 can be recorded into the keyboard recorder, and played back on the keyboard recorder.
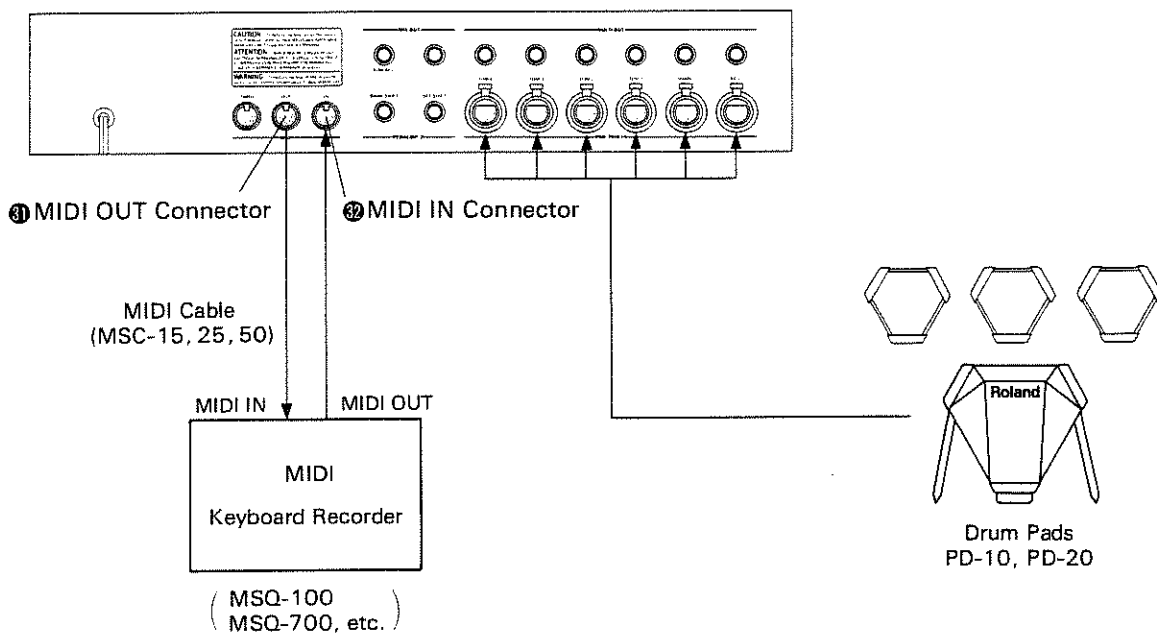
㉛ MIDI OUT Connector　　㉜ MIDI IN Connector

MIDI Cable
(MSC-15, 25, 50)

MIDI IN　　MIDI OUT

MIDI
Keyboard Recorder

(MSQ-100)
(MSQ-700, etc.)

Drum Pads
PD-10, PD-20

REFERENCE

a. Setting MIDI Receive Channel (P. 28)
b. Setting MIDI Transmit Channel (P. 29)
c. OMNI ON/OFF (P. 30)
d. Note Number assignment to Drum Voices (P. 31)
e. MIDI MIX ON/OFF (P. 33)

b. Setup with a rhythm machine

In this setup, the DDR-30 serves as an external sound source for the rhythm machine. The drum sounds in the DDR-30 plays according to the patterns programmed on the rhythm machine.

⑫MIDI IN Connector

MIDI Cable (MSC-15, 25, 50)

MIDI OUT

MIDI Rhythm Machine

(TR-707, etc.)
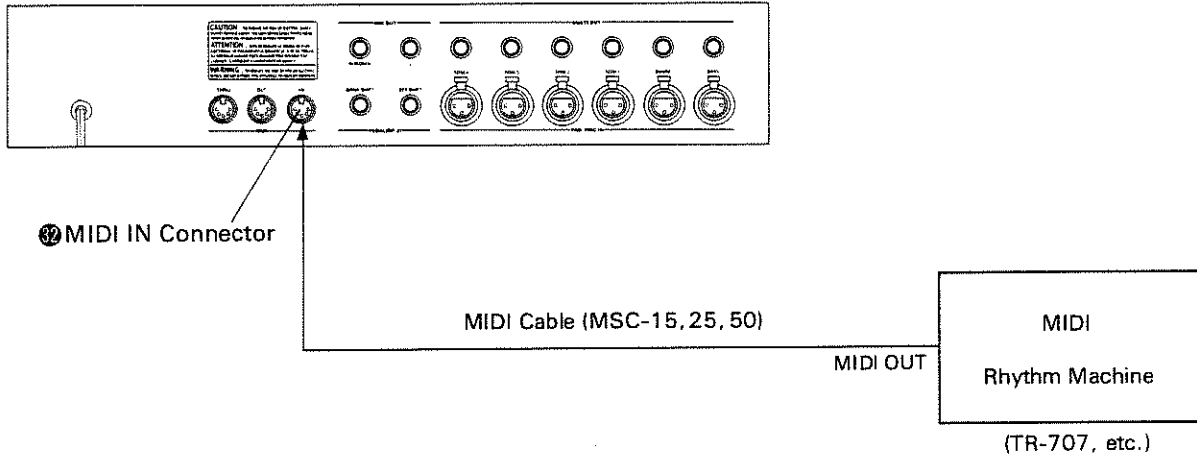
c. Setup with a synthesizer

In this setup, the DDR-30's drum voices will sound by playing the relevant keys on the keyboard.

⑫MIDI IN Connector

MIDI Cable (MSC-15, 25, 50)

MIDI OUT

MIDI Keyboard

$\left(\begin{array}{c} \text{HP-100} \\ \text{JX-8P, etc.} \end{array} \right)$
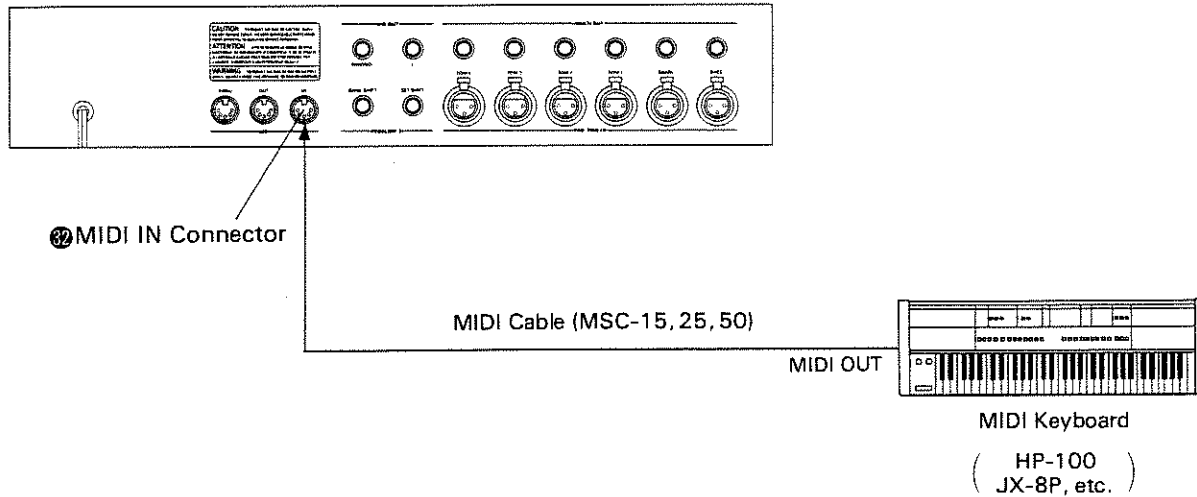
REFERENCE

a. Setting MIDI Receive Channel (P. 28)
c. OMNI ON/OFF (P. 30)
d. Note Number assignment to Drum Voices (P. 31)

26

d. Setup with a MIDI sound module

In this setup, the connected sound module (or the sound section of the synthesizer) can sound by playing the drum pads (PD-10, PD-20). The pitches of the sounds vary depending on the Note Numbers of the pads.

㉛ MIDI OUT Connector

MIDI Cable
(MSC-15, 25, 50)

MIDI IN ▼

MIDI

e.g. Synthesizer

(MKS-30, MKS-7)
(JUNO-106, JX-8P, etc.)

Drum Pads
PD-10, PD-20
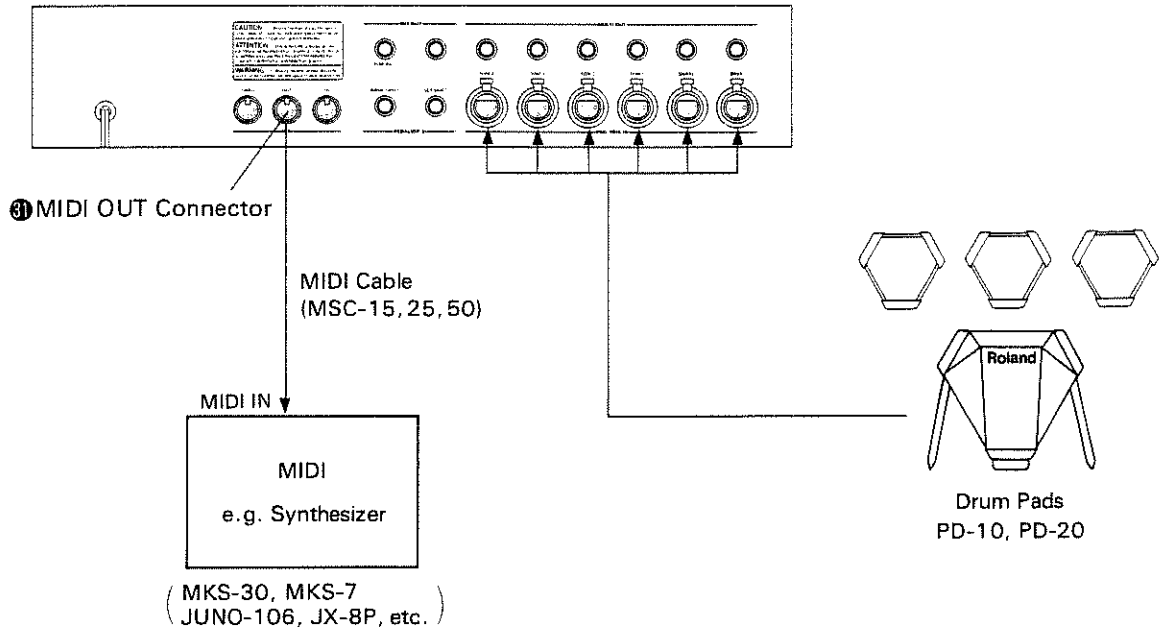
REFERENCE

b. Setting MIDI Transmit Channel (P. 29)
d. Note Number assignment to Drum Voices (P. 31)

2. MIDI

The DDR-30 features three MIDI Connectors MIDI
IN, MIDI OUT and MIDI THRU. For the detals of
MIDI, read the separate book "MIDI".

a. Setting MIDI Receive Channel

When controlling the DDR-30 by an external MIDI
device (e.g. example setups a, b and c), it is re-
quired to match the DDR-30's MIDI receive chan-
nel to the transmit channel of the external device.

OPERATION

① **Push the MIDI Button ⑰**

The indicator of the MIDI button lights up.

② **Press the Forward Button ⑨ or Back Button
   ⑪ until " *MIDI CHANNEL* " is shown in
   the Display.**

At the right of the Display, the current receive
channel is shown.

③ **To change the channel numbers, rotate the
   Alpha Dial ⑱ until the Display shows the
   number you want.**

16 channel numbers 1 to 16 are available for re-
ceive channels. Rotating the dial clockwise for-
wards a number and counterclockwise backs up
one.

④ **If you wish to leave the MIDI Setting mode,
   press the MIDI Button ⑰.**

Now, the indicator of the button goes out, and the
display is returned to the usual indication.

* The channel number set here is the receive
  channel. The DDR-30 can receive the messages
  which are sent on the same channel as this,
  ignoring any other messages. When the mes-
  sages are received, the MIDI Message Indicator
  ㉑ will light up.

* If you wish to go on other MIDI settings, e.g. set-
  ting a transmit channel, OMNI ON/OFF, etc, do
  not push the MIDI Button.

b. Setting MIDI Transmit Channel

When controlling other external MIDI device by the DDR-30, e.g. example setup d (see page 27), it is required to set the DDR-30's transmit channel to the same number as the external device. The DDR-30 allows individual channel setting for each drum voice.

OPERATION

① **Push the MIDI Button ⑰.**

② **Press the Forward Button ❽ or the Back Button ⑩ until " $\overline{J}\overline{J}$ $CHRNNEL$ " is shown in the Display.**

Now, the DDR-30 is ready to set transmit channel for each drum voice. The indication at the left of the Display " $\overline{J}\overline{J}$ " means Bass Drum, and the number at the right is the set transmit channel of Bass Drum. If you wish to set the channel number for BD, skip the next step than go directly to step ④.

③ **Press the Instrument Button ❻ until the Display shows the drum voice whose transmit channel you wish to change.**

④ **Rotate the Alpha Dial ⑱ until the desired channel number is shown at the right of the Display.**

⑤ **Repeat the steps ③ and ④ as many times if you wish to change the channel numbers of other drum voices.**

It is possible to set several drum sounds to the same channel numbers.

⑥ **Push the MIDI Button to leave the MIDI Setting mode.**

Now, the indicator of the button goes out, and the display is returned to the usual indication.

c. OMNI ON/OFF

For the details of OMNI ON/OFF mode, read the separate book "MIDI".
When the DDR-30 is set to the OMNI ON mode, it will recognize all the messages transmitted regardless of the set receive channel. This mode may be selected when simultaneously controlling the DDR-30 with the MIDI messages transmitted from several different channels. Also, this mode can be used when you do not know the transmit channel of the external device.

OPERATION

① **Push the MIDI Button ⑰**

The indicator of the MIDI button lights up.

② **Press the Forward Button ⑧ or Back Button ⑦ until "MIDI OMNI" is shown in the display.**

* At the right of the Display, the current OMNI mode; ON or OFF is shown.

③ **If you wish to change the modes, use the Alpha dial.**

Rotating the dial clockwise will set ON, and counterclockwise OFF.

④ **If you wish to leave the MIDI setting mode, push the MIDI Button ⑰.**

Now, the indicator of the button goes out, and the display is returned to the usual indication.

Example (a. and c.)

① Push the MIDI Button ⑰.

② Using Forward or Back Button;...

* Call "MIDI CHANNEL"

current channel

* Call "MIDI OMNI"

current setting

③ Set it as you like.

1~16

ON/OFF
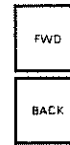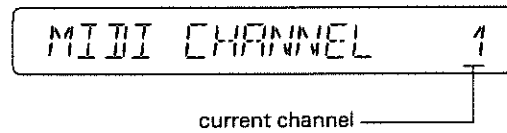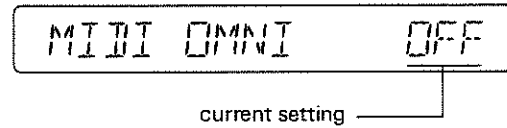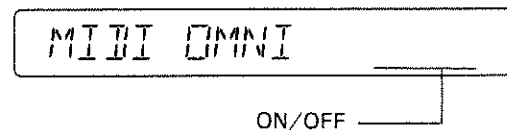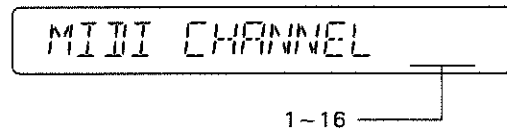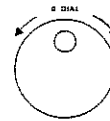
d. Note Number Assignment to Drum Voices

The messages of pitch (notes of the keyboard) are called Note Numbers. On the percussive instrument that features MIDI, a Note Number can be assigned to each drum voice, allowing communication of performance informations between them.

1) Note Number Assignment from the manufacturer

Drum Voice	BD	SD	TM1	TM2	TM3	TM4
Note No.	36	38	43	42	41	40

Middle C
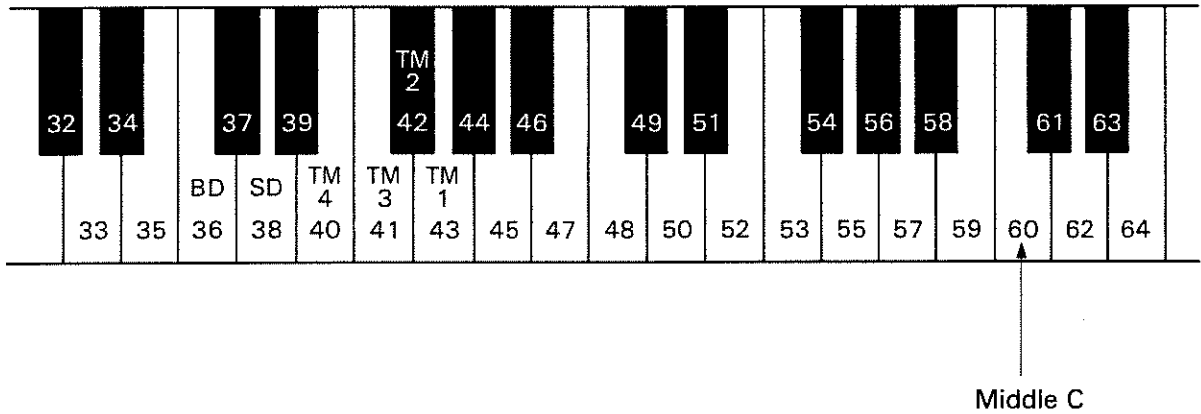
2) How to assign Note Numbers

OPERATION

① **Push the MIDI Button ⑰.**

② **Press the Forward Button ⑨ and the Back Button ⑪ until " JJ $NOTE$ " is shown in the Display.**

```
JJ    NOTE        JG
```

──Note Number indication

Selected   Current Note Number
drum voice   of the selected drum voice.
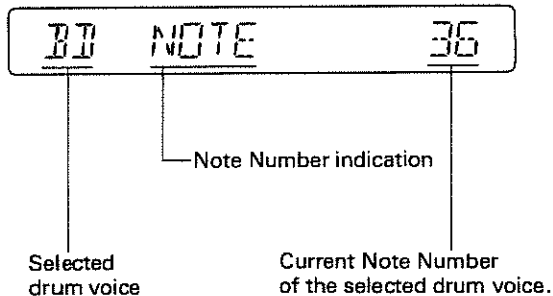
Now, you can assign a Note Number to each drum voice. The " JJ " at the left of the Display is the drum voice and the number at the right end is the Note Number assigned to it. If you want to change the Note Number of the Bass Drum, skip the next step and go directly to the step ④.

③ **Press the Instrument Button ⑥ until the display shows the drum voice whose Note Number you wish to change.**

④ **If you wish to change the Note Number, use the Alpha Dial ⑬.**

⑤ **Repeat the procedures ③ and ④ as many times, if you wish to change the Note Numbers assigned to other drum voices.**

It is possible to set the same Note Number to several different drum voices.

⑥ **If you wish to leave this MIDI Setting mode, push the MIDI Button.**

Now, the indicator of the button goes out, and the display is returned to the usual indication.

* The Note Numbers can be used for both receive and transmit.

e. MIDI MIX ON/OFF

Usually, the signals received at the MIDI IN are not sent out to the MIDI OUT but to the MIDI THRU. However, it is sometimes more convenient to mix the messages received from the MIDI IN and the messages of the DDR-30 itself, then send the mixed messages from the MIDI OUT. This is the idea of MIDI MIX.

OPERATION

① **Push the MIDI Button ⑰.**

The left of the Display shows MIDI MIX, and the right shows ON or OFF.

② **To change the On/Off of MIDI MIX, use Alpha Dial.**

Rotating the Dial clockwise will change to ON, and counterclockwise OFF.

③ **If you wish to leave the MIDI Setting mode, push the MIDI Button ⑰.**

Now, the indicator of the button goes out, and the display is returned to the usual indication.

* While in the MIDI Setting mode, MIDI MIX is Off.

* When the DDR-30 is operating with MIDI MIX On, it may suddenly stop operating. If this happens, keep pressing the MIDI Button until the Display changes.

Example (b. and d.)

① Push the MIDI Button ⑰.

② Using Forward or Back Button,
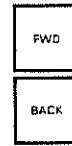
* Call "BD CHANNEL"

current channel

* Call "BD NOTE"

current Note Number
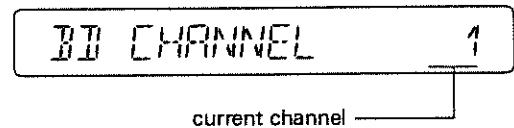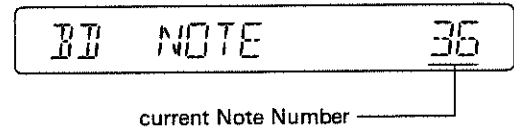
③ Call other drum voice by using the Instrument Button ⑥.

④ Set the transmit channel or the note number of the selected drum voice.
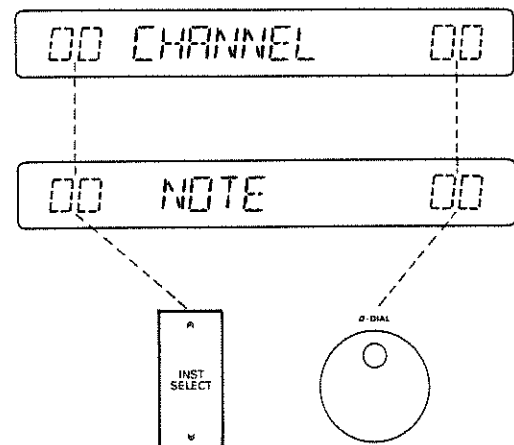
* Repeat these procedures ③ and ④.

f. Program Change

By using the Program Change numbers (see the separate book "MIDI"), you can externally (e.g. by a synthesizer) select a Drum Set of the DDR-30. Also, it is possible to change the patch programs on the synthesizer by operating the DDR-30.

Program Change numbers are assigned to the Drum Sets (11 to 48) of the DDR-30 as shown below. This combination cannot be changed.

Program No. ↔	Drum Set	Program No. ↔	Drum Set	Program No. ↔	Drum Set	Program No. ↔	Drum Set
0	11	8	21	16	31	24	41
1	12	9	22	17	32	25	42
2	13	10	23	18	33	26	43
3	14	11	24	19	34	27	44
4	15	12	25	20	35	28	45
5	16	13	26	21	36	29	46
6	17	14	27	22	37	30	47
7	18	15	28	23	38	31	48

Set / Bank	①	②	③	④	⑤	⑥	⑦	⑧
1	0	1	2	3	4	5	6	7
2	8	9	10	11	12	13	14	15
3	16	17	18	19	20	21	22	23
4	24	25	26	27	28	29	30	31

* For instance, when the DDR-30 receives Program Change number 20, the Drum Set 35 (Bank 3, Set 5) will be automatically selected.

● Error Message Table

● Memory Cartridge

CART NOT INSERT	CART PROTECT NOW
This is seen if you press the Cartridge Button ⑮ without the Memory Cartridge connected, or if the Memory Cartridge is disconnected while in use.	This is seen if you try to rewrite the memory on the Cartridge with the Protect Switch on the Memory Cartridge set to ON.
* Securely connect the Memory Cartridge, then repeat the procedure.	* Set the Protect Switch on the Memory Cartridge to the OFF position, and repeat the procedure.

● MIDI

MIDI COMMUNI ERR	MIDI BUFFER OVER
This is seen if there is some error during MIDI messages' communication.	This is seen if the buffer memory for transmission is overflowed.
* Press any of the button on the front panel to leave the error, then carefully repeat the procedure. (Refer to "MIDI Implimentaiton Chart".)	* Press the MIDI Button ⑰ to leave the error, then carefully repeat the procedure.

DDR-30 MIDI Implementation Chart

Function··········		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1 – 16 * 1 – 16 *	1 – 16 * 1 – 16 *	* memorized
Mode	Default Messaged Altered	OMNI ON/OFF **************	1 or 3 * POLY, OMNI ON/OFF	
Note Number	True voice	0–127 * **************	0–127 * ×	
Velocity	Note ON Note OFF	○ 9nh V = 1–127 × 9nh V = 0	○ 9bh V = 1–127	b = Basic Channel n = Inst Channel
After Touch	Key's Ch's	× ×	× ×	
Pitch Bender		×	×	
Control Change		×	×	
Program Change	True	○ (0–31) **************	○ (0–127) 0–31	
System Exclusive		○	○	
System Common	Song Pos Song Sel Tune	× × ×	× × ×	
System Real Time	Clock Commands	× ×	× ×	
Aux Mes- sages	Local ON/OFF All Notes OFF Active Sense Reset	× × × ×	× × × ×	
Notes		Received messages are usually transmitted without mix sw off and MIDI edit mode.		

Mode 1 : OMNI ON, POLY   Mode 2 : OMNI ON, MONO   ○ : Yes

Mode 3 : OMNI OFF, POLY   Mode 4 : OMNI OFF, MONO   × : No

DDR-30 MIDI Implementation

1. TRANSMITTED DATA

Status	Second	Third	Description	
1001 xxxx	0kkk kkkk	0vvv vvvv	Note ON	:*1
			kkkkkkk=0-127	
			vvvvvvv=1-127	
			vvvvvvv=0	:Note OFF
1011 nnnn	0ccc cccc	0vvv vvvv	Mode Messages	
			ccccccc=124	:OMNI mode OFF
			=125	:OMNI mode ON
			vvvvvvv=0	
1100 xxxx	0ppp pppp		Program Change	:*2
			ppppppp=0-31	:Set 11-48
1111 0000	0100 0001		System Exclusive ROLAND	
1111 0111			EOX	

Notes: *1 Each Inst (BD SD TM1..TM4) is able to set for each
          channel which has 1-16 channel and memorized

      *2 When pressing SET or BANK up /down button,
         receiving MIDI program changed data from
         external MIDI instrument on its basic channel,
         it will be transmitting program changed data
         that corresponds to the basic channel or each
         INST channel on SET

         When transmitting same as send before MIDI program #
         It does not send the signal to MIDI OUT.

2. RECOGNIZED RECEIVE DATA

Status	Second	Third	Description	
1001 nnnn	0kkk kkkk	0vvv vvvv	Note ON (Trigger)	
			kkkkkkk=0-127	
			vvvvvvv=1-127	
1011 nnnn	0ccc cccc	0vvv vvvv	Mode Messages	
			ccccccc=124	:OMNI mode OFF
			=125	: " " ON
			=127	:POLY mode ON
			vvvvvvv=0	
1100 nnnn	0ppp pppp		Program Change	
			ppppppp=0-31	:Set 11-48
			=32-63	
			=64-95	
			=96-127	
1111 0000	0100 0001		System Exclusive ROLAND	
1111 0111			EOX	

3. HANDSHAKING COMMUNICATIN

3.1 Messages type

3.1.1 Want to send a file (WSF)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0100 0000	Operation code
d 0000 nnnn	Unit # (Basic channel)
f 0010 0010	Format type
g 1111 0111	End of System Exclusive

3.1.2 Request a file (RQF)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0100 0001	Operation code
d 0000 nnnn	Unit # (Basic channel)
f 0010 0010	Format type
g 1111 0111	End of System Exclusive

3.1.3 Data (DAT)

Byte	Description			
a 1111 0000	Exclusive status			
b 0100 0001	Roland ID #			
c 0100 0010	Operation code			
d 0000 nnnn	Unit # (Basic channel)			
e 0010 0010	Format type			
f 0000 0bbb	Block # (0-6)			
		bbb=0 : BD	1-8	(16byte * 8)
		bbb=1 : SD	1-8	
		bbb=2 : TM1	1-8	
		bbb=3 : TM2	1-8	
		bbb=4 : TM3	1-8	
		bbb=5 : TM4	1-8	
		bbb=6 : SET	11-88	(16byte * 32)
g 0ddd dddd				
:	Data bbb=0-5 : 128 bytes			
0ddd dddd	bbb=6 : 192 bytes			
h 0sss ssss	Check sum : Summed value of the all bytes			
	: In Block # , Data and Check sum			
	: must be 00h (7bits)			
i 1111 0111	End of System Exclusive			

3.1.4 Acknowledge (ACK)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0100 0011	Operation code
d 0000 nnnn	Unit # (Basic channel)
f 0010 0010	Format type
g 1111 0111	End of System Exclusive

3.1.5 End of files (EOF)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0100 0101	Operation code
d 0000 nnnn	Unit # (Basic channel)
f 0010 0010	Format type
g 1111 0111	End of System Exclusive

3.1.6 Communication error (ERR)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0100 1110	Operation code
d 0000 nnnn	Unit # (Basic channel)
f 0010 0010	Format type
g 1111 0111	End of System Exclusive

3.1.7 Rejection (RJC)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0100 1111	Operation code
d 0000 nnnn	Unit # (Basic channel)
f 0010 0010	Format type
g 1111 0111	End of System Exclusive

3.2 Sequence of communication

3.2.1 Load Sequence

```
      WSF :        Want to sent a file      (received)
      ACK :        Acknowlege               (transmitted)
[     DAT :        Data                     (received)
      ACK :                                 (transmitted) ]
      [ : ]
      [ : ]

      EOF :        End of file              (received)
      ACK :                                 (transmitted)
end

!!!! If data error
   :
      DAT :                                 (received)
      ERR :        Communication error      (transmitted)
      RJC :        Rejection                (received)
      RQF :        Request a file           (received)
      DAT :                                 (transmitted)
      ACK :                                 (received)
   :             :(7 times)
   :

      EOF :                                 (transmitted)
      ACK :                                 (received)

end

!!!! If data err

      DAT :                                 (transmitted)
      ERR :                                 (received)
      RJC :                                 (transmitted)
```

3.3 Data format

bbb=0-5

	1	2	3	4	5	6	7	8
	SOURCE NUMBER	ENV LEVEL	ENV DECAY	ATTAK LEVEL	ATTAK DECAY	GATE1 LEVEL	GATE1 TIME	GATE1 RELES
DISP	1-4	0-99	1-99	0-99	1-99	0-99	0-89	1-99
Data	0-3	0-99	0-98	0-99	0-98	0-99	0-99	0-98

	9	10	11	12	13	14	15	16
	GATE2 LEVEL	GATE2 RELES	PITCH	BEND DEPTH	BEND DECAY	BEND DYSNS	EQ TREBLE	EQ BASS
DISP	0-99	1-99	-24-+24	0-99	1-99	0-99	-6-+6	-6-+6
Data	0-99	0-98	48-0	0-99	0-98	0-99	0-12	0-12

*8

bbb=6

	1	2	3	4	5	6
INST	BD	SD	TM1	TM2	TM3	TM4
DISP	1-8	1-8	1-8	1-8	1-8	1-8
Data	0-7	0-7	0-7	0-7	0-7	0-7

*32

4. Message Type

4.1 Messages

4.1.1 Program number (PGR)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0100	Operation code
d 0000 nnnn	Unit # (Basic channel)
f 0010 0010	Format type
g 001v 0000	LV# v=0 : Level 1
	v=1 : Level 2
h 0000 0ggg	GR# v=0 : ggg=1-6
	v=1 : ggg=0
i 0000 0000	EP#
j 000p pppp	PG# v=0 : p pppp=0-7
	v=1 : p pppp=0-1Fh
k 0000 00ff	FN# read : ff=1
	write : ff=2
l 1111 0111	End of System Exclusive

4.1.2 All Parameters (APR)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0101	Operation code
d 0000 nnnn	Unit # (Basic channel)
f 0010 0010	Format type
g 001v 0000	LV#
h 0000 0ggg	GR#
i 0ddd dddd	value
	v=0 : 16bytes
:	v=1 : 6bytes
0ddd dddd	
j 1111 0111	End of System Exclusive

4.1.3 Individual Pramater (IPR)

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0011 0110	Operation code
d 0000 nnnn	Unit # (Basic channel)
f 0010 0010	Format type
g 001v 0000	LV#
h 0000 0ggg	GR#
[i 0000 rrrr	PR#
	v=0 : rrrr=0-15
	v=1 : rrrr=0-5
j 0ddd dddd	value]
[:]	
[:]	
k 1111 0111	End of System Exclusive

4.2 Sequence

4.2.1 Set change & set data read

PGR (Level 2 read)	: Program number	(received)
APR (Level 2)	: All Parameters	(transmitted)

4.2.2 Patch change & Parameter read

1)
PGR (Level 1 read)	:	(received)
APR (Level 1)	:	(transmitted)

2)
IPR (Level 2)	: Individual parameter	(received)
[APR (Level 1)	:	(transmitted)]
[:]		
[:]		

4.2.3 Parameter change

IPR (Level 1)	:	(received)

4.2.4 Set write

PGR (Level 2 write) :		(received)

4.2.5 Edit write

PGR (Level 1 write) :		(received)

4.2.6 Parameter load

APR (Level 1)	:	(received)

4.3 Data Format

-- LEVEL1

GR#: Group number

GR	01h	02h	03h	04h	05h	06h
INST	BD	SD	TM1	TM2	TM3	TM4

PG#: Patch number

PG	00h	01h	02h	03h	04h	05h	06h	07h
Patch	1	2	3	4	5	6	7	8

PR#: Parameter number

PR	00h	01h	02h	03h	04h	05h	06h	07h
	SOURCE NUMBER	ENV LEVEL	ENV DECAY	ATTAK LEVEL	ATTAK DECAY	GATE1 LEVEL	GATE1 TIME	GATE1 RELES
DISP	1-4	0-99	1-99	0-99	1-99	0-99	0-99	1-99
Value	0-3	0-99	0-98	0-99	0-98	0-99	0-99	0-98

PR	08h	09h	0Ah	0Bh	0Ch	0Dh	0Eh	0Fh
	GATE2 LEVEL	GATE2 RELES	PITCH	BEND DEPTH	BEND DECAY	BEND DYSNS	EQ TREBLE	EQ BASS
DISP	0-99	1-99	-24-+24	0-99	1-99	0-99	-6-+6	-6-+6
Value	0-99	0-98	48-0	0-99	0-98	0-99	0-12	0-12

--LEVEL2

PG#: Set number

PG	00h	01h	02h	03h	04h	05h	06h	07h
SET	11	12	13	14	15	16	17	18

PG	08h	09h	0Ah	0Bh	0Ch	0Dh	0Eh	0Fh
SET	21	22	23	24	25	26	27	28

PG	10h	11h	12h	13h	14h	15h	16h	17h
SET	31	32	33	34	35	36	37	38

PG	18h	19h	1Ah	1Bh	1Ch	1Dh	1Eh	1Fh
SET	41	42	43	44	45	46	47	48

PR#: Inst number

PR	00h	01h	02h	03h	04h	05h
INST	BD	SD	TM1	TM2	TM3	TM4
DISP	1-8	1-8	1-8	1-8	1-8	1-8
Value	0-7	0-7	0-7	0-7	0-7	0-7

5 Specifications

<DDR-30: Digital Drum Module>

- **Drum Set**

Memory Capacity:	32 set (4 banks × 8 sets)
Drum Voices:	6 (BD, SD, TM1, TM2, TM3, TM4)
Pad Sensitivity:	Available per voice

- **Drum Sound**

Bass Drums:	8 (BD-1 ~ BD-8)
Snare Drums:	8 (SD-1 ~ SD-8)
Toms 1:	8 (TM1-1 ~ TM1-8)
2	8 (TM2-1 ~ TM2-8)
3	8 (TM3-1 ~ TM3-8)
4	8 (TM4-1 ~ TM4-8)

- **Display Window**
- **MIDI Message Indicator**
- **Memory Cartridge Holder**

- **Parameters**

VOICE:	Source Number
	Level
	Envelope Decay
	Attack Level
	Attack Decay
PITCH:	Pitch
	Bend Depth
	Bend Decay
	Dynamics Sensitivity
EQUALIZER:	Treble
	Bass
GATE:	Gate Level 1
	Gate Time
	Gate Release 1
	Gate Level 2
	Gate Release 2

- **Performance Control Section**

  Edit Write Button
  Set Write Button
  Bank Button
  Set Buttons (1 ~ 8)
  Instrument Button
  Patch Number Button
  Forward Button
  Back Button
  Voice Button
  Pitch Button
  Equalizer Button
  Gate Button
  Sensitivity Button
  Copy Button
  Cartridge Button
  MIDI Button
  Alpha Dial
  Power Switch

- **Connectors**

  Pad Trigger Input Connectors (× 6)
  Multi Out Jacks (× 6)
  Mix Out Jacks (L, R)
  Bank Shift Jack
  Set Shift Jack
  MIDI IN Connector
  MIDI OUT Connector
  MIDI THRU Connector

- **Power Consumption:**

  24W

- **Dimensions:**

  483(W) × 88(H) × 300(D) mm
  19"(W) × 3$\frac{7}{16}$"(H) × 11$\frac{13}{16}$"(D)

- **Weight:**

  5 kg/ 11 lb. 6 oz

- **Accessories:**

  Connection Cables II-250(x2)

- **Options:**

  Drum Pad PD-10
  Drum Pad PD-20
  Pedal Switch DP-2
  Memory Cartridge M-16C

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