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SPECIFICATIONS

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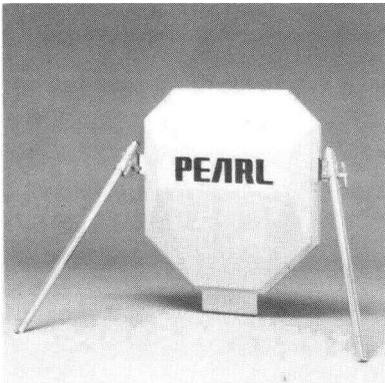
# SYSTEM OVERVIEW

## \* Method of Operation

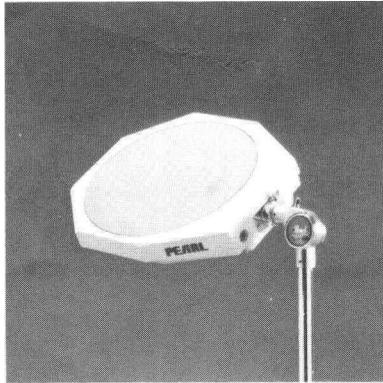
The SC-40 and SC-20 are the tone generating units. Please connect them to Pearl's Electronic Drum and Cymbal Pads, MIDI equipped keyboard and sequencer, etc. to transmit the control signals.

### I. Using Pads

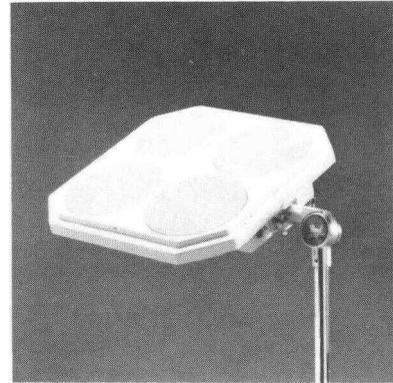
Any Pearl Electronic Drum pad can be used without modification. You can set-up your own system with the pads. (Regardless of pad shape, any timbre can be generated by any of the following pads. i.e. a bass drum pad can trigger a cymbal sound, etc.)



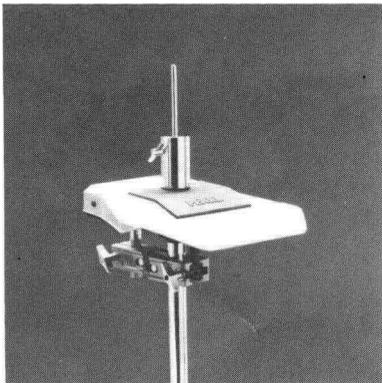
BP-2  
Bass Drum Pad



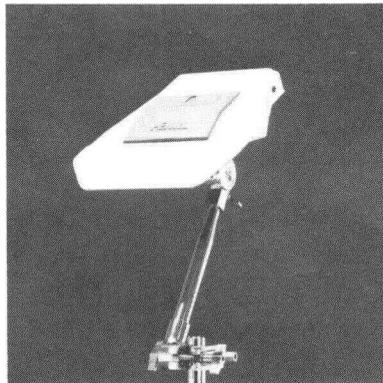
TP-2  
Snare Drum/Tom Tom Pad



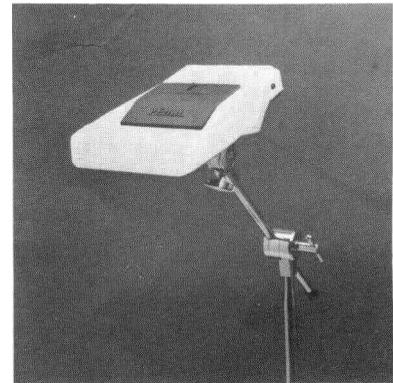
QP-1  
Quad Pad



HP-1  
Hi-Hat Pad



CP-1  
Cymbal Pad



CP-1B  
Cymbal Boom Pad

• The DRUM-X pads (BP-2 and TP-2) can also be connected to the SC-40 and SC-20 tone units.

\*By connecting the above pads to the SC-40 and SC-20, each pad can be used as a MIDI pad.

### II. Using MIDI Controller

The SC-40 and SC-20 are MIDI equipped tone generators and may be connected and controlled by MIDI controllers (Keyboard, Sequencer, etc.), without using any pads.

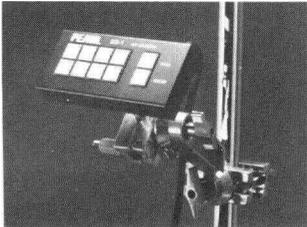
## \* Optional Accessories

For more effective and efficient performance, the SC-40 or SC-20 can be used with the following optional accessories.



### PE-8 Pad Expander Unit

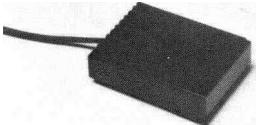
Using this unit with the SC-40 or SC-20, a player can increase the number of pads to a maximum of 16, (Turn the Tone Unit OFF, then connect the PE-8 to the SC-40 or SC-20. Next, switch the PAD MODE to "16" at the rear panel of the Tone Unit. Lastly, turn the Tone Unit back ON.)



### KS-1 Kit Selector

A compact size remote Kit Selector.

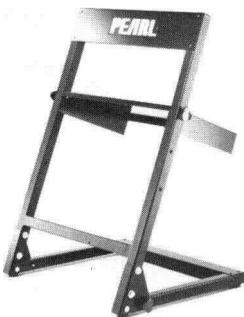
(Connect the device to the KIT SELECTOR terminal at the rear panel of the tone unit.)



### MP-1 Mute Pedal

Pedal for muting the sound overall.

(Connect the device to the MUTE terminal at the rear panel of the tone unit.)



### TUR-1 Tone Unit Rack

Rack for the SC-40 or SC-20 tone units. EIA standard 19" rack.

Note: For hardware such as the Drum Rack, Stands, etc., please refer to Pearl's Professional Series Drum Catalog. (Pearl's acoustic Tom Holders, TH-95, TH-80, etc., are compatible to the TP-2 Snare Drum/Tom Tom Pad and QP-1 Quad Pad.)

# PRELIMINARY INFORMATION

## ◆ BASIC TERMS

Since the following terms will be used many times in the coming pages, we recommend that you understand and remember the important terms and their meanings.

### \* Kit/Pad/Parameter/Value

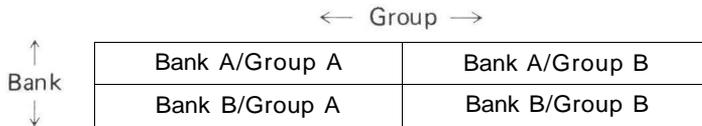
- KIT ..... One program set
- PAD ..... A unit of the program or a unit of the controller
- PARAMETER ..... Factors synthesizing the timbre
- VALUE ..... Measurement of each parameter

KIT 1	KIT ?	KIT 8
D 1	D 1	D 1
D 2	D 2	D 2
D 3	D 3	D 3
D 4	D 4	D 4
D 5	D 5	D 5
D 6	D 6	D 6
D 7	D 7	D 7
D 8	D 8	D 8

A D 1	
PARAMETER	VALUE
Vf	31
TCH	3
DUU1QN	10
VELOCITY CURVE 3	
PAD ?.	
PARAMETER	VALUE
WAVE	10
PITCH	63
MODULATION	0
VELOCITY CURVE ?	
PAD 8	
PARAMETER	VALUE
HAVE	0
PITCH	73
MODULATION	6
VELOCITY CURVE 1	

### \* Bank/Group

A maximum of 32 kits (in the case of an 8 pad mode) can be programmed into SC-40 and SC-20.



KIT NUMBER



BANK GROUP

Both LED indicators indicate B when lit, A when off.



Bank A/Group A, Kit No.1



Bank B/Group A, Kit No.1



Bank A/Group B, Kit No.1



Bank B/Group B, Kit No.1

Eight keys (1 to 8) x two Banks (A & B) x two Groups (A & B) = 32 kits, which are the maximum programmable kits.

\* Connecting the PE-8 Pad Expander Unit to use pads 9 to 16 by switching the PAD MODE from "8" to "16", Group A and B become the same one group.

### \*Test Kit

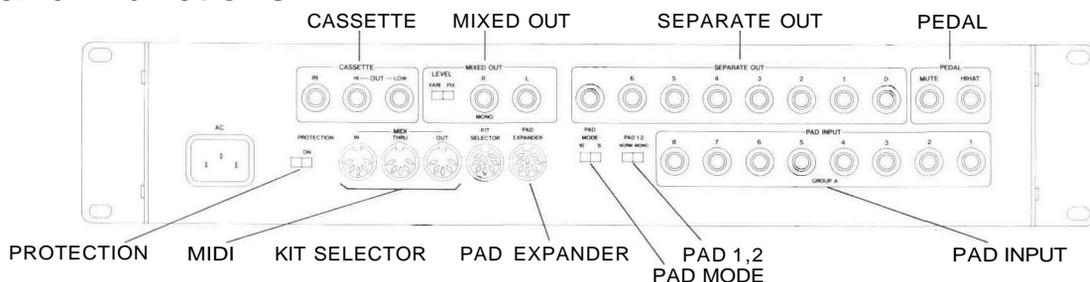
In Addition to 32 programs (kits), one extra kit with a 16 pad connection option is provided to test timbre-synthesizing without changing any data already programmed on the NORMAL kit. To modify the timbres, please practice the normal key operations to change the timbres on the TEST KIT. Before leaving the TEST KIT, please check the timbres you modified in order to insure that you received the timbres you desired.

While the PROTECTION switch on the rear panel is ON, only the TEST KIT program data can be changed. (The NORMAL kit program data is protected and can not be changed.)

PAD PROGRAM (NORMAL)	[BANK A/GROUP A]	[BANK A/GROUP B]
	KIT 1	KIT 1
	KIT 2	KIT 2
	KIT 3	KIT 3
	KIT 4	KIT 4
	KIT 5	KIT 5
	KIT 6	KIT 6
	KIT 7	KIT 7
PAD PROGRAM (TEST)	[BANK B/GROUP A]	[BANK B/GROUP B]
	KIT 1	KIT 1
	KIT 2	KIT 2
	KIT 3	KIT 3
	KIT 4	KIT 4
	KIT 5	KIT 5
	KIT 6	KIT 6
	KIT 7	KIT 7
	[TEST GROUP A]	[TEST GROUP B]

# ◆ REAR PANEL/CONNECTIONS

## \* Names and Functions



### ◆ CASSETTE (See Retaining the Programmed Data)

For retaining the programmed data using a cassette tape recorder.

IN . . . . . For loading data, connect the SC-40's or SC-20's IN input to the OUTPUT terminal of a cassette tape recorder.

OUT. . . . . For retaining data, connect the tone unit's OUT outputs to the INPUT terminal of a cassette tape recorder.

HI: For the Line level inputs  
 LOW: For the Mic level inputs

### ◆ MIXED OUT (See Connections)

R, L . . . . . Stereo out to two amplifiers, mixer, etc.

Use the "R" output jack for the mono out.

- While the SEPARATE OUT terminal is used (plugged in) to send out the desired signal(s), this signal(s), which the "OUT CH." number is assigned by the parameter, cannot be sent out of the MIXED OUT.

- \* While the stereo out is applied, each channel's sound signal can be panned from left to right by assigning the "OUT CH." parameter numbers from 0 to 7.

LEVEL (VARI/FIX) . . . This switch is effective for controlling the VOLUME on the front panel. If the level is switched to VARI, you can control the volume of the output by the VOLUME control knob. If switched to FIX, the volume is fixed and not changeable. Whether the LEVEL is switched to VARI or FIX, the headphone volume control is always effective.

### ◆ SEPARATE OUT (See Connections)

The output signals can be sent out separately from the SEPARATE OUT by using the parameter of the "OUT CH." to assign the numbers.

- \* Each pad can be assigned to an individual "OUT CH." number. Plural pads can also be assigned to a single "OUT CH." number.

- While the SEPARATE OUT terminal is used (plugged in) to send out the desired signal(s), this signal(s), which the "OUT CH." number is assigned by the parameter, can not be sent out of the MIXED OUT.

### ◆ PEDAL (See Optional Accessories and Hi-Hat Pad Connections)

Terminals for using the optional HI-HAT and MUTE pedals.

MUTE. . . . . For the MUTE pedal and is designed to mute the sound signal overall.

HI HAT. . . . . For the HI-HAT pad. Open/Close performance can be done by plugging into this terminal and PAD INPUT 1 .

### ◆ MIDI (See MIDI)

Terminal to connect a MIDI instrument.

### ◆ KIT SELECTOR (See Optional Accessories)

Terminal for using the Optional KIT SELECTOR. By connecting the KIT SELECTOR to this terminal, programmed kits can be selected by remote control.

### ◆ PAD EXPANDER (See Optional Accessories)

Terminal for using the optional PAD EXPANDER. By connecting the Pad Expander unit to the SC-40 or SC-20, a maximum of 16 pads can be used.

### ◆ PROTECTION (See Operation)

The Protection switch protects all the 32 programs from being changed and/or erased due to mistakes or accidents while it is "ON". Before the kit and pad programmings can be changed, the switch must be turned OFF. If not, any programming changes will not be carried out.

◆PAD MODE (See Optional Accessories)

Whenever using the Pad Expander unit, please switch the SC-40's or SC-20's AC power OFF first. Then switch the PAD MODE from 8 to 16 or 16 to 8. Lastly, switch the AC power back ON. If the PAD MODE is switched while the AC power is ON, the desired mode selection will not be carried out.

◆PAD 1, 2 (See Hi-Hat Pad Connection)

When using the PAD INPUT 1 and 2 for the Open/Closed Hi-Hat sounds, please switch to MONO.

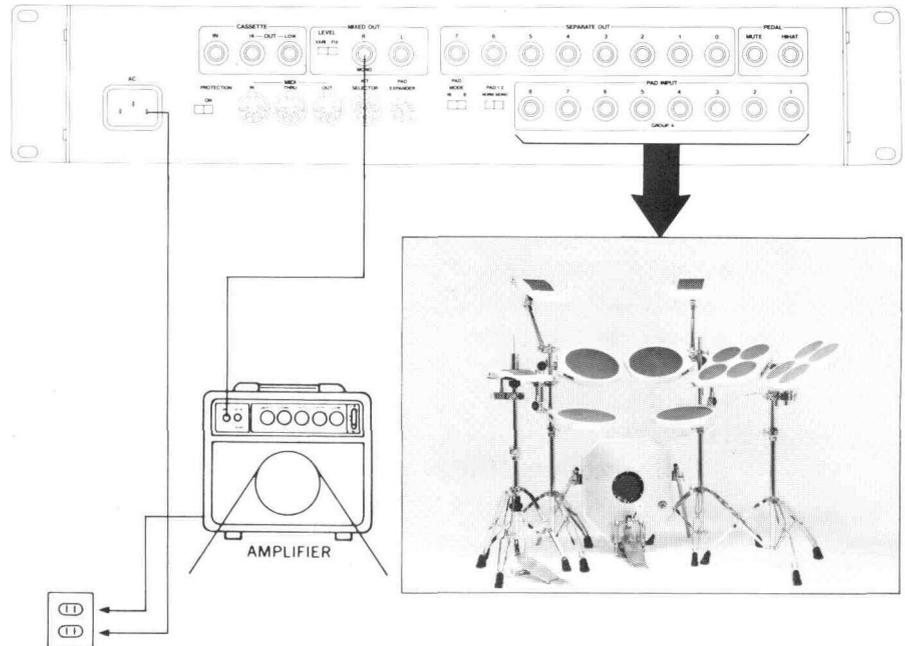
When using the PAD INPUT 1 and HIHAT (input) for the Open/Closed Hi-Hat sound, please switch to NORM.

◆PAD INPUT (See Connections and Hi-Hat Pad Connection)

Input terminal for all pads. For Hi-Hat sounds, you may use PAD INPUT 1 (switching PAD 1, 2 to NORM and connecting to HIHAT) or PAD INPUT 1 and 2 (switching PAD 1, 2 to MONO).

## \* Basic Connections

Connect each pad to the PAD INPUT, the AC cord's plug to the AC outlet and the MIXED OUT R (mono out) to an amplifier or mixer input.



SAMPLE: PAD INPUT ALLOCATION FOR A DRUM KIT

PAD INPUT	PAD	
1	HP-1	Hi-Hat Pad
2	CP-1	Cymbal Pad (Crash)
3	CP-1	Cymbal Pad (Ride)
4	TP-2	Snare Drum Pad
5	BP-2	Bass Drum Pad
6	TP-2	Tom Tom Pad (1)
7	TP-2	Tom Tom Pad (2)
8	TP-2	Tom Tom Pad (3)

You can use the above set-up as a drum kit to play KIT programs (Bank A/Group A) for the drum sounds. (Changing the programs, other KIT programs can be used for drum sounds.)

Upon shipping from the factory, the "KITS" of the SC-40 and SC-20 are programmed (users can easily change) as follows:

Bank A/Group A = Drum Kit

Bank A/Group B = Preset (Bank A) Drum/Cymbal sounds

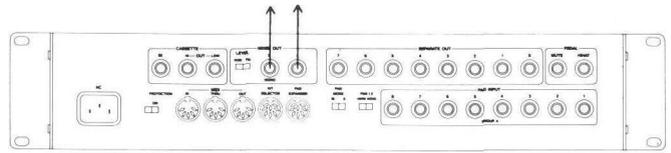
Bank B/Group A = Percussion sounds

Bank B/Group B = Preset (Bank B) Percussion sounds

(See FACTORY PROGRAMMED KIT LIST and FACTORY PRESET TIMBRE LIST)

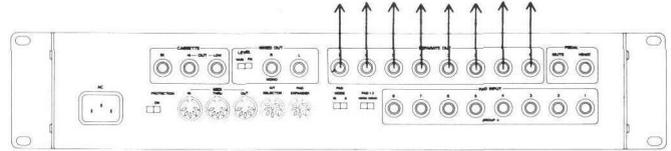
### (Stereo Out)

Connect the MIXED OUT L and R to two (2) amplifiers or mixer. Each sound signal can be panned by assigning the "OUT CH." number. (See Parameter)



### (Separate Out)

Connect each SEPARATE OUT jack to each line input jack of a mixer. The output signals can be sent out separately from the SEPARATE OUT by using the parameter of the "OUT CH." to assign the number.



- \* Each pad can be assigned to an individual "OUT CH." number. Plural pads can also be assigned to a single "OUT CH." number.
- \* While the Separate Out terminal is used (plugged in) to send out the desired signal(s), the signal(s), which the OUT CH. number is assigned by the parameter, can not be sent out of the MIXED OUTPUT.

## \* Hi-Hat Pad Connections

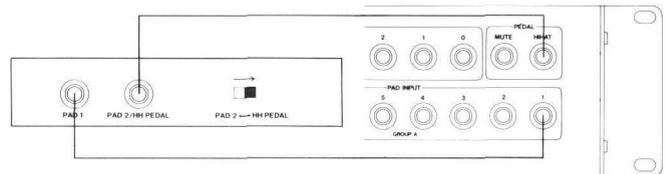
There are two (2) ways to connect the Hi-Hat Pad to obtain the Hi-Hat sounds.

1. Using PAD 1 program only.  
Pad 1 program's TONE timbre and ATTACK one are selected for the Open and Closed sounds by open and close foot pedaling.
2. Using PAD 1 and PAD 2 programs.  
Closed sound of PAD 1 program and the Open sound of PAD 2 program are selected by pedaling.

### ^Connections^

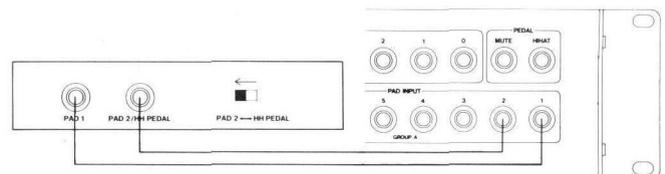
In case of 1.

1. Connect the PAD INPUT 1 of the SC-40/SC-20 to the PAD 1 terminal of the Hi-Hat Pad.
2. Connect the PEDAL HIHAT input of the SC-40/SC-20 to the PAD 2/HH PEDAL of the Hi-Hat pad.
3. Slide the switch on the Hi-Hat pad to "HH PEDAL".
4. Slide the "PAD 1, 2" switch of the SC-40/SC-20 to "NORM".



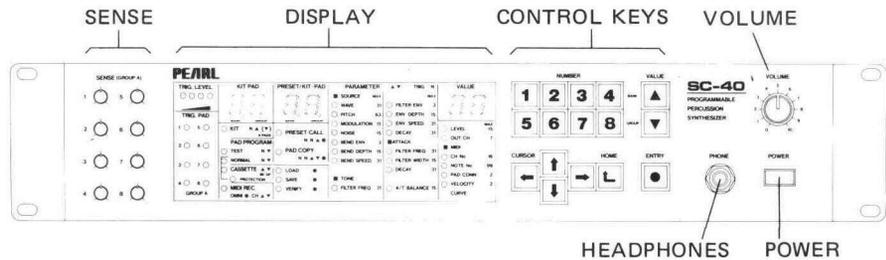
In case of 2.

1. Connect the PAD INPUT 1 of the SC-40/SC-20 to the PAD 1 terminal of the Hi-Hat pad.
2. Connect the PAD INPUT 2 of the SC-40/SC-20 to the PAD 2/HH PEDAL of the Hi-Hat pad.
3. Slide the switch on the Hi-Hat pad to "PAD 2".
4. Slide the "PAD 1, 2" switch of the SC-40/SC-20 to "MONO".



# ◆ FRONT PANEL/BASIC OPERATION

## \* Names and Functions



### ◆ SENSE (See Adjusting the Sensitivity)

Each knob adjusts the trigger sensitivity of each pad.

### ◆ DISPLAY (See Control Keys/Display)

The finish of the programming operation or operating state is displayed.

### ◆ CONTROL KEYS (See Control Keys/Display)

Key marks are placed after the display words in order to show which key is depressed.

### ◆ VOLUME

The volume knob controls the master signal level for the MIXED OUT and HEADPHONE. By switching the MIXED OUT LEVEL to FIX, the volume control knob will only be effective for the HEADPHONE while the MIXED OUT LEVEL will be fixed.

### ◆ PHONE

Terminal for the headphone monitor.

### ◆ POWER

AC power switch.

## \* Control Keys/Display

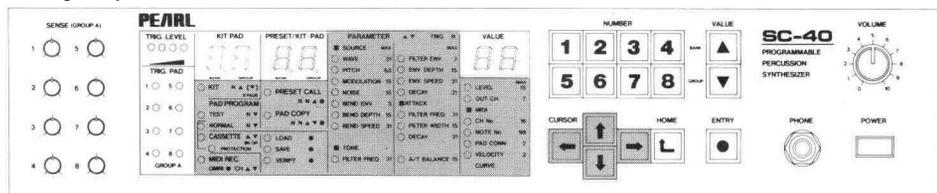
By pressing the CURSOR key, you can move the LED indicator to the word where the desired operation should be carried out. The key marks are printed right after the words and instruct you as to which control key should be pressed.

### I. Cursor

#### ^CURSOR

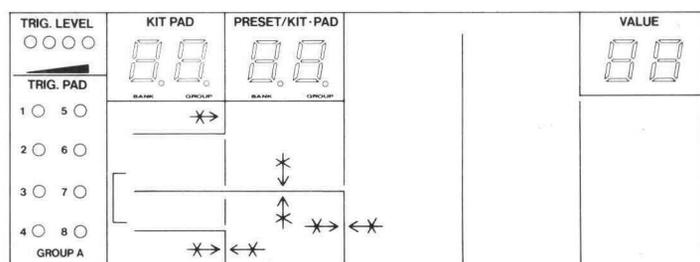
The LED indicator can move up, down, left or right by pressing the CURSOR keys (blue colored). Press the key for short durations and the CURSOR indicator moves step by step. Press the key for a long duration, the CURSOR moves quickly.

#### <CURSOR indicator's Moving Scope>



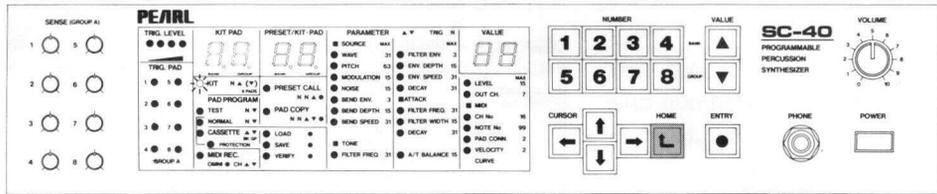
\* The CURSOR indicator's moving scope is separated into plural blocks. Each block is partly blocked by a vertical line, leaving a through gate, and has a functional character. The CURSOR indicator can only move to other blocks through the gate and does not jump over to other blocks without passing through the gate.

• While the PROTECTION switch is ON and the LED is lit-up red at PROTECTION in the front display, the LED indicator can jump over NORMAL and CASSETTE.



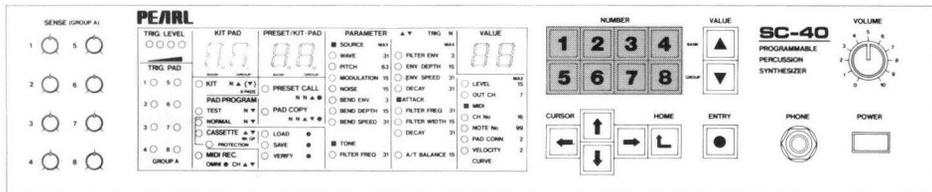
◆ HOME

By pressing the HOME key (blue colored), the CURSOR indicator moves back to the KIT section instantly from wherever it is.



## II. Key Marks and Control Keys

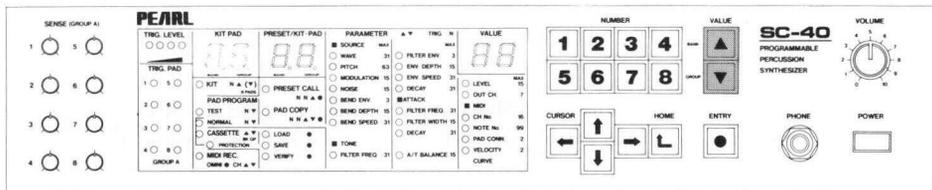
◆ NUMBER



While the CURSOR indicator is moved to such words as KIT, PAD PROGRAM, PRESET CALL, and PAD COPY, a number can be selected by pressing the NUMBER key. Two (2) figures simultaneously can be displayed by LED's in the "PRESET/KIT PAD" column, for example, one in the left hand column and another in the right. After the initial two figures are lit-up, by pressing the NUMBER key again the right figure is shifted to the left hand column and the newly pressed number is displayed in the right column.

» While the CURSOR indicator is in the PARAMETER block (except in the MIDI section), the NUMBER keys can be used as manual trigger keys. The volume of sound increases in proportion to the Key Number from 1 to 8.

◆ VALUE, BANK/GROUP



<When the CURSOR indicator is located in the PARAMETER block>

The value of a parameter is measured by pressing the VALUE keys. Press the key for short durations, the value changes step by step. By pressing the key for long duration, the value changes rapidly and continuously.

<When the CURSOR indicator is located at KIT, PAD PROGRAM, CASSETTE, PRESET CALL or PAD COPY>

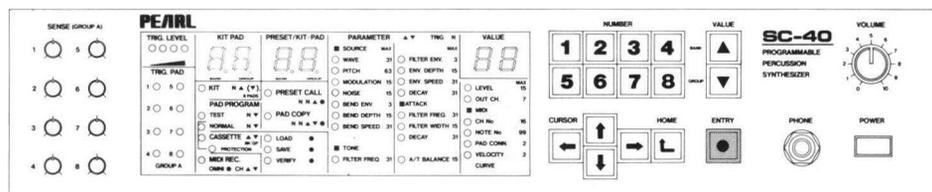
Bank and Group are changed from A to B or from B to A whenever the BANK key ▲ or GROUP key ▼ is pressed.

•TEST KIT of PAD PROGRAM has no BANK. PRESET CALL is a call for 128 factory preset timbres (un-changeable by users) but has no GROUP.

<When the CURSOR indicator is located at MIDI REC.>

Channel assignment of the OMNI OFF mode is enabled. A Channel Number can be selected by pressing either ▲ or ▼ key.

◆ ENTRY



PRESET CALL, PAD COPY, LOAD, SAVE and VERIFY are carried out by pressing the ENTRY key. The MIDI REC. mode (Omni On or Off) is also selected by this key.

### III. Display



#### ◆ Trigger Check Area

The input trigger level is displayed by the TRIG. LEVEL LED and the stroked pad numbers are indicated by the lighting of the TRIG. PAD LED. The trigger sensitivity for each pad may be adjusted as desired (See Adjusting the Sensitivity).

#### ◆ KIT

By pressing the NUMBER keys (1 to 8), the desired Kit is selected. This is a starting point of operations.

Location of the CURSOR indicator	Operation	Display
KIT	To select the desired Kit number.	The selected Kit (Bank & Group) is displayed.



#### ◆ PAD PROGRAM

This is an area to modify and/or change timbres. You can select pads at this area and can copy timbres via PRESET CALL or PAD COPY to them. If necessary, you can modify the copied timbres by parameter operations.

Location of the CURSOR indicator	Operation	Display
PAD PROGRAM TEST	To test the timbre modification in the Test Kit.	The letter "t" is displayed.



The pad number of which you are going to modify is selected by pressing the desired NUMBER key.



PAD PROGRAM NORMAL	Modify the timbres by selecting the desired pad numbers.	Kit number is the number that is assigned at KIT position.
--------------------	--	--



Next, move the CURSOR indicator to the right.



Via PRESET CALL and/or PAD COPY, you can copy and program timbres to the pads which are selected at PAD PROGRAM.

Location of the CURSOR indicator	Operation	Display
PRESET CALL	To call back one of the 128 factory preset timbres and to copy it, if so desired, into the designated Kit Pad. Call and copy are carried out by pressing the ENTRY key.	The preset Number is displayed with numbers ( 1 1 to 88) and Bank (A or B).



PAD COPY	To copy the programmed timbre data of other KIT PAD programs into the designated KIT PAD. The numbers of the programmed KIT, PAD, BANK and GROUP from which you are going to copy can be selected and copying is carried out by pressing the ENTRY key.	First off, press the NUMBER key to select the desired KIT number which is displayed in the right hand column. Secondly, press the NUMBER key to select the desired PAD number which is displayed in the right hand column. The KIT number is automatically shifted to the left hand column.
----------	---	---



»When using the PRESET CALL and PAD COPY, only the value of the 16 parameters (from WAVE to A/T BALANCE) are copied and not the values of the 6 parameters (from LEVEL to VELOCITY CURVE).

Next, move the CURSOR indicator to the right. ↓

If you wish to modify the Timbre, please move the Cursor indicator to the desired parameter first, then assign the value.

Location of the CURSOR indicator	Operation	Display
PARAMETER	To modify the timbre, move the CURSOR indicator to the desired parameter.	The value of the selected parameter is displayed.



#### ◆CASSETTE Area

In this area, timbre data save and load are done.

Location of the CURSOR indicator	Operation	Display
CASSETTE	To retain the programmed data on a cassette and to verify it. Saving and loading of the data is carried out by A and B of Bank and Group.	The letter "C" is displayed in the right hand column.



Next, move the CURSOR indicator to the right. ↓

The undermentioned shows how to save, verify and load the programmed data.

Location of the CURSOR indicator	Operation	Display
LOAD	To load the programmed data saved on the cassette tape back into the Tone Unit. Loading is carried out by pressing the ENTRY key.	<p>By pressing the ENTRY key, the letter "L" is displayed.</p>  <p>After loading the data is completed, the word "End" is displayed.</p> 
SAVE	To retain the programmed data on the cassette tape. Retaining the data is carried out by pressing the ENTRY key.	<p>By pressing the ENTRY key, the letter "S" and value "00" are displayed. After flickering, value "00" changes to "47". Then the value "47" changes back to "00". After loading the data is completed, the word "End" is displayed.</p>  
VERIFY	To verify whether the programmed data is retained onto the cassette tape. Verifying is carried out by pressing the ENTRY key.	<p>By pressing the ENTRY key, the letter "v" is displayed. If nothing wrong occurred with the retaining of the data, the word "End" is displayed.</p> 

◆ MIDI Recognition Mode/Channel Assignment

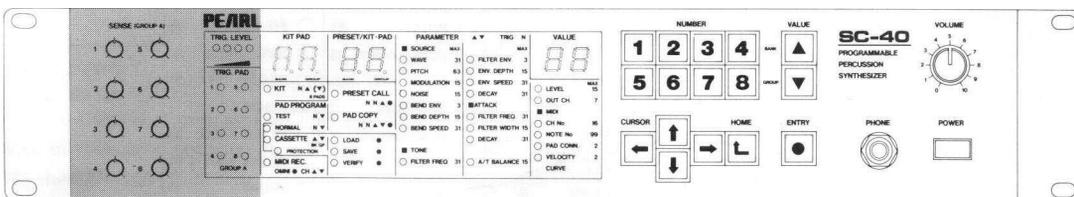
Location of the CURSOR indicator	Operation	Display
MIDI REC.	To select the MIDI Recognition Mode (Omni On or Off). By pressing the ENTRY key, either the Omni On or Off is selected by turns. In the case of Omni Off, channel assignment is done by pressing the VALUE key.	<p>While the Omni On is selected, the word "on" is displayed. While the Omni Off is selected, the letters "cH" and Channel Number are displayed in the VALUE column.</p>  

# OPERATION

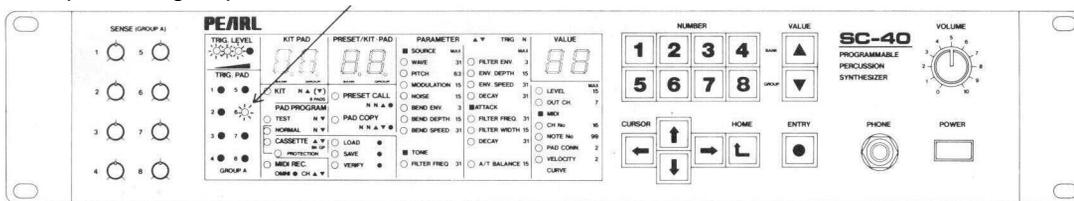
On the panels of SC-40 and SO-20, there are many keys, knobs, terminals, switches etc. It is not always necessary to use them all. First, please master the "Basic Operations for Playing the Instrument (Kit Selection)". With such Basic Operations, you can enjoy the percussion sounds of the factory KIT/PAD programs.

## ◆ ADJUSTING THE SENSITIVITY

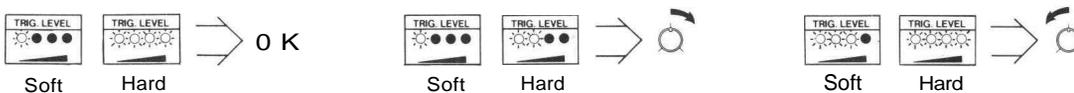
Please be sure to adjust the sensitivity of each pad after it is connected to either the SC-40 or SC-20.



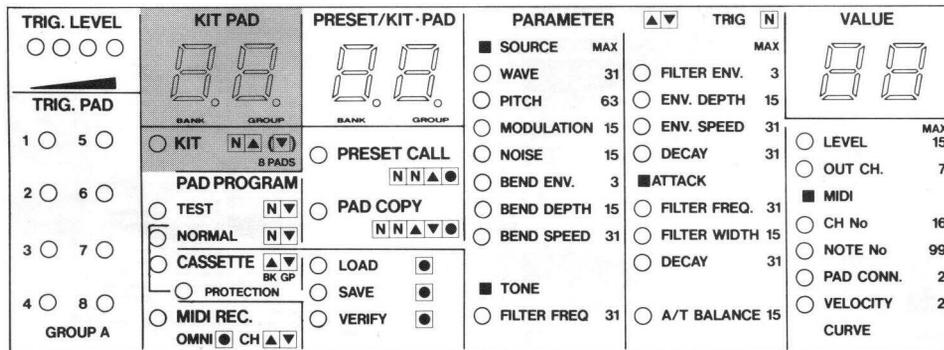
1. In order to check the TRIG. PAD LED indicators on the front display panel, strike each pad separately. The indicator of the struck pad will light up.



2. To check the TRIG. LEVEL display, strike each pad hard and soft. Turn the sensitivity knob so that the far left end of the TRIG. LEVEL'S indicators lights up when each pad is struck softly, and all four indicators light up when each pad is struck softly, and all four indicators light up when each pad is struck hard. If all four indicators are lit-up when each pad is struck softly, turn the sensitivity knob counter-clockwise. If all four indicators are not lit-up when the pad is struck hard, turn the knob clockwise.

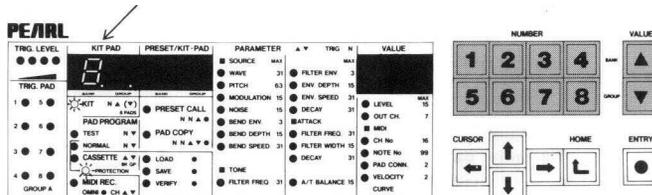


## ◆ BASIC OPERATIONS FOR PLAYING THE INSTRUMENT (KIT SELECTION)



1. Move the CURSOR indicator to "KIT", then select the desired factory programmed kit (or the re-programmed kit henceforth) by pressing the correct NUMBER, BANK and GROUP keys.

\* By pressing the "HOME" key, the CURSOR indicator will automatically and instantly move back to "KIT" from any location on the front display panel.

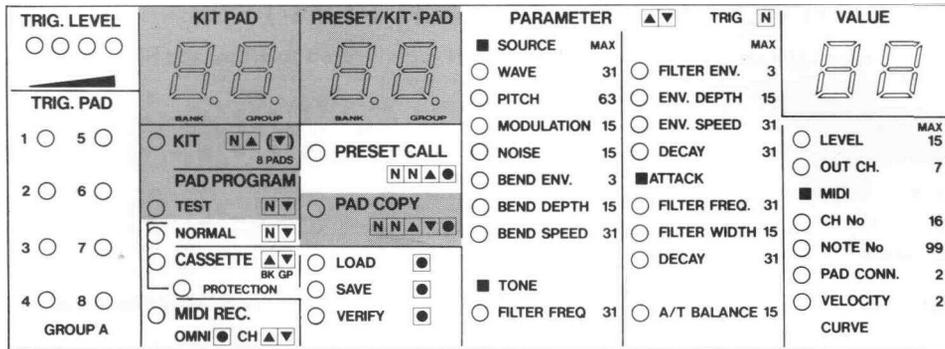


# ◆ TIMBRE CHANGE/MODIFICATION(on TEST KIT)

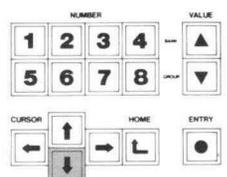
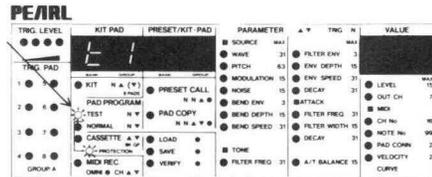
The TEST KIT is provided for you to check whether or not the timbres and programs are modified as desired, before actually changing any of the 32 factory preset programs.

## I. Rearranging the Kit Program (PAD COPY)

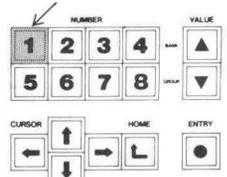
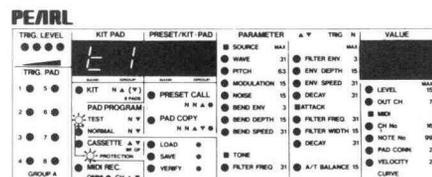
The desired KIT PAD timbres can be copied to any pad in any kit instantly. By such copying, a kit can be reprogrammed easily. The following is an example of how to program a "KIT" on the TEST KIT.



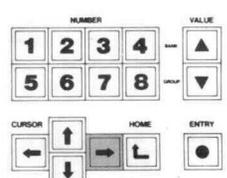
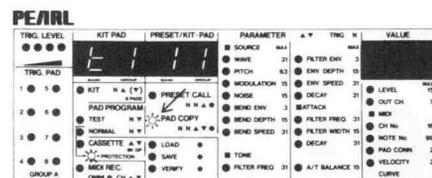
1. Move the CURSOR indicator to TEST of the PAD PROGRAM.



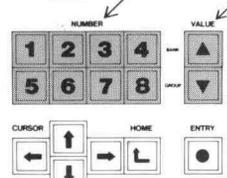
2. Select the PAD number 1 by pressing the NUMBER key 1.



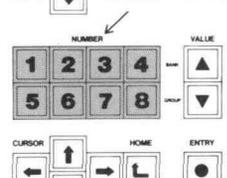
3. Move the CURSOR indicator to PAD COPY.



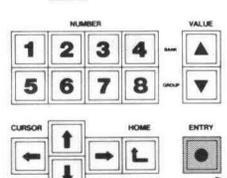
4. Select the KIT and PAD number with the desired timbre to be copied to PAD 1, by pressing the correct NUMBER, BANK and GROUP keys.



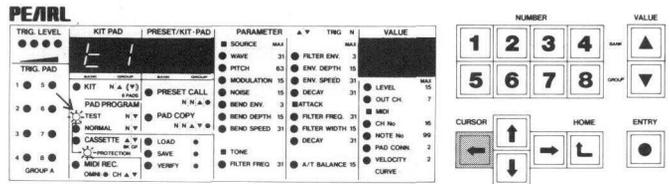
5. Press the ENTRY key and copying is carried out instantly. Without pressing the ENTRY key, the copying will never be carried out.



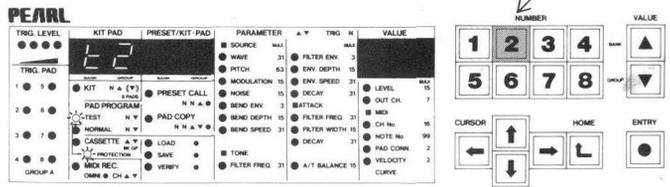
\*The values of the 16 parameters (governing the synthesizing of the timbre) from WAVE to A/T BALANCE are the only parameters (not the remaining 6 parameters from LEVEL to VELOCITY CURVE) that can be copied.



6. After completing the copying, move the CURSOR indicator back to TEST of the PAD PROGRAM.



7. Next, by pressing the NUMBER key, select PAD 2 and then please follow the same operation to copy the data.



8. For Pads 3, 4, 5, 6, 7 and 8, please copy the data by following the entire previously mentioned procedure.

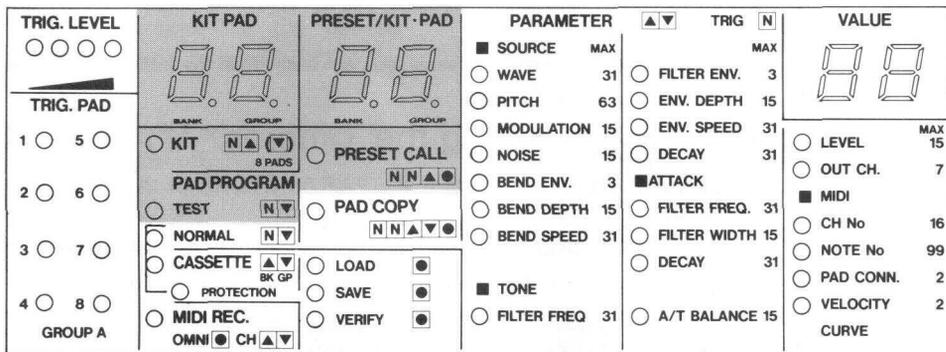
\* By moving the CURSOR indicator to LEVEL and assigning a value, you can adjust the output level of each pad in order to achieve a fine balance of the sound between all the pads.

\* By moving the CURSOR indicator to PITCH and assigning a value, you can also adjust the pitch of each pad.

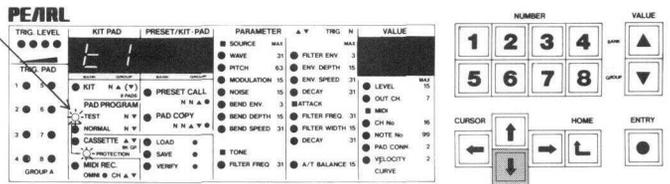
## II. Preset Timbres (PRESET CALL)

128 factory preset timbres are stored in both the SC-40 and SC-20. Any of the preset timbres can be copied to KIT PAD instantly in a very similar operation as done for PAD COPY.

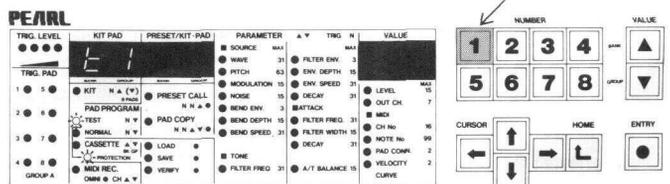
The following is an example of how to program a "KIT" by copying the factory Preset Timbres on TEST KIT.



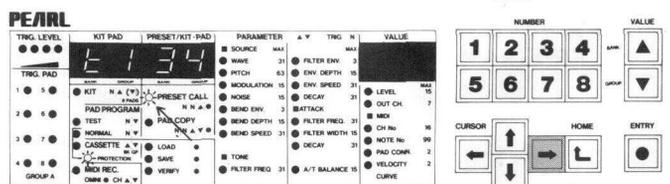
1. Move the CURSOR indicator to TEST of the PAD PROGRAM.



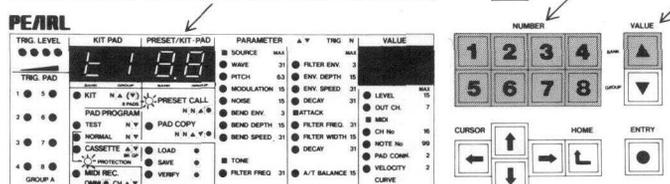
2. Select the PAD number 1 by pressing the NUMBER key 1.



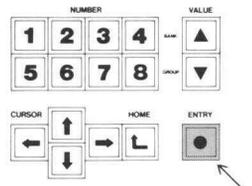
3. Move the CURSOR indicator to PRESET CALL.



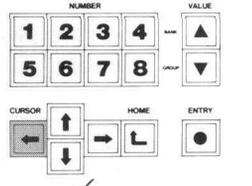
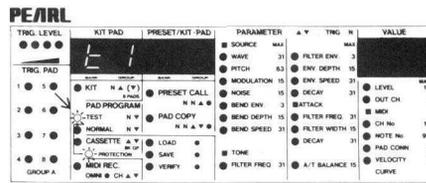
4. Referring to the FACTORY PRESET TIMBRE LIST, first choose the timbre number, then display it by pressing the correct NUMBER and BANK (A or B) keys.



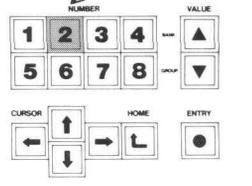
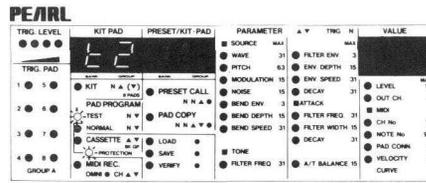
5. Press the ENTRY key and copying is carried out instantly. Without pressing the ENTRY key, the copying will never be carried out.



6. After completing the copying, move the CURSOR indicator back to TEST of the PAD PROGRAM.



7. Next, by pressing the NUMBER key, select PAD 2 and then please follow the same operation to copy the data.



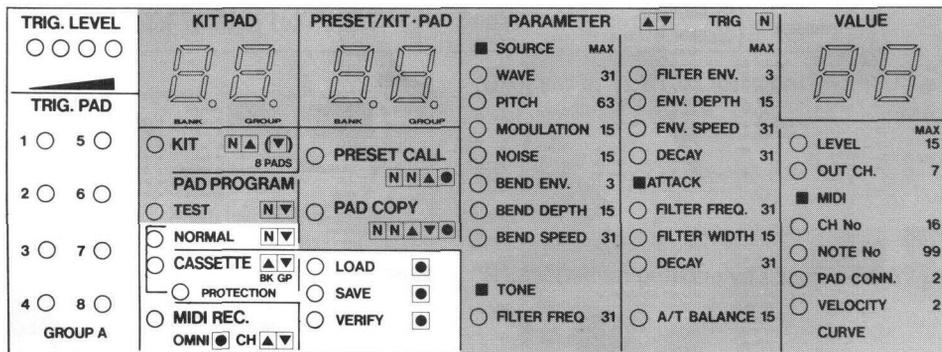
8. For Pads 3, 4, 5, 6, 7 and 8, please copy the data by following the entire previously mentioned procedure.

- \* Using the two preceding methods, you can choose to copy the timbre either from PAD COPY or PRESET CALL to any pad.
- « By moving the CURSOR indicator to LEVEL and assigning a value, you can adjust the output level of each pad in order to achieve a fine balance of sound between all the pads.
- \* By moving the CURSOR indicator to PITCH and assigning a value, you can also adjust the pitch of each pad.

### III. Parameter Control <Synthesizing the Timbres> (PARAMETER/VALUE)

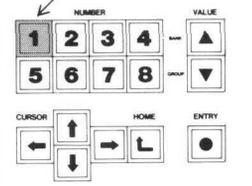
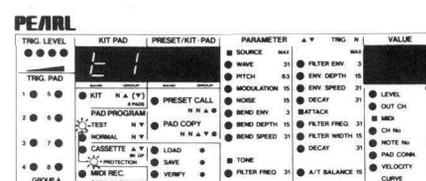
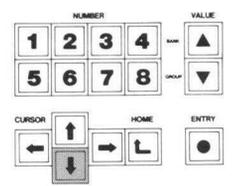
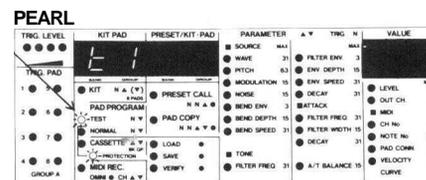
The timbres of the SC-40 and SC-20 are synthesized from the PARAMETERS in their corresponding values and then programmed.

Operations of "PAD COPY" and "PRESET CALL" are the basic operations to call back and copy the programmed data. If the copied timbre are not to your liking, you may modify them by changing the necessary parameter's value.

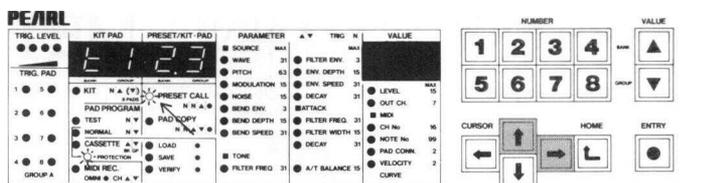


The following is an example of how to program a "KIT" on the TEST KIT by synthesizing the timbres from various parameters.

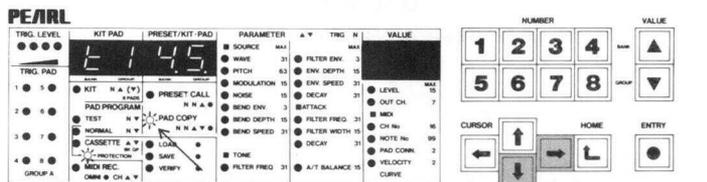
1. Move the CURSOR indicator to TEST of the PAD PROGRAM.
2. Select the PAD number 1 by pressing the NUMBER key 1.



3. Move the CURSOR indicator to PRESET CALL or PAD COPY.

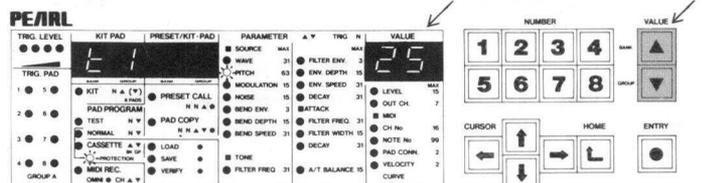
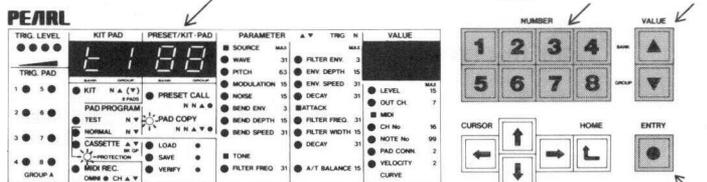


4. Referring to the FACTORY PRESET TIMBRE LIST or FACTORY PROGRAMMED KIT LIST, first choose the Timbre number or Kit Pad numbers, respectively, then display them by pressing the correct NUMBER, BANK (PadCopy/Preset Call) and GROUP (Pad Copy) keys. Press the ENTRY key and copying is carried out instantly. Without pressing the ENTRY key, the copying will never be carried out.

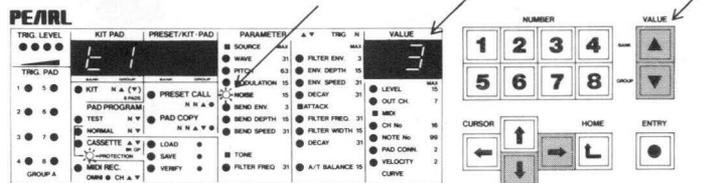


\* The values of 16 parameters (governing the synthesizing of the timbre) from WAVE to A/T BALANCE are the only parameters (not the remaining 6 parameters from LEVEL to VELOCITY CURVE) that can be copied.

5. Move the CURSOR indicator to the desired PARAMETER you are going to modify. (See Parameter)
6. Press the VALUE keys to increase or decrease the value of the parameter as desired.

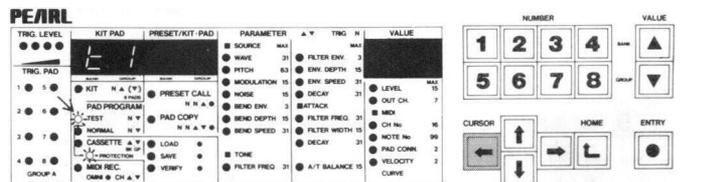


7. Move the CURSOR indicator to the next PARAMETER and change the value as desired.

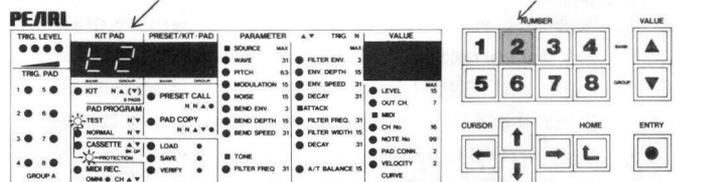


8. In the same operation as preceding, change the values of the remaining parameters in order to synthesize the timbres as desired.

9. After completing the synthesizing, move the CURSOR indicator to TEST of PAD PROGRAM.



10. Next, by pressing the NUMBER key, select PAD 2 and then please follow the same operation to synthesize the timbre for PAD 2.



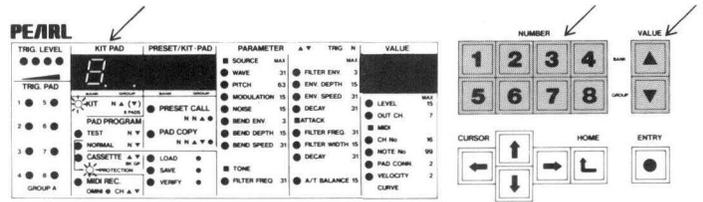
11. For Pads 3, 4, 5, 6, 7 and 8, please synthesize the timbres by following the entire previously mentioned procedure to complete the Kit.

\* While the CURSOR indicator is in the PARAMETER block and if the AC power is switched OFF during the synthesizing of timbre and before the CURSOR indicator is returned to KIT or PAD PROGRAM, the new timbre will not be memorized.

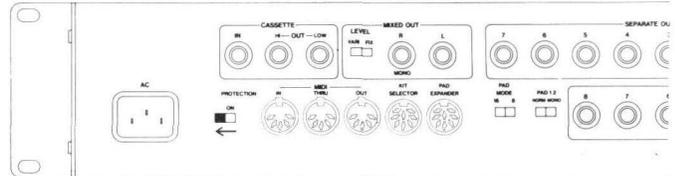
# ◆ PROGRAMMING METHODS

Note: Please make certain to write your TEST KIT's data in order to program a KIT PAD.

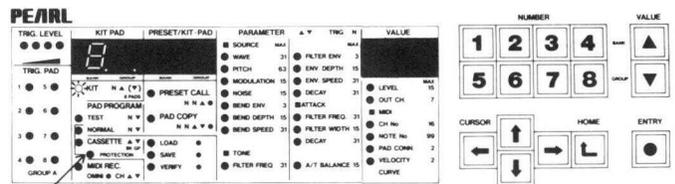
1. Please select the KIT number (together with using the BANK and GROUP) of the programmed data you wish to reprogram.



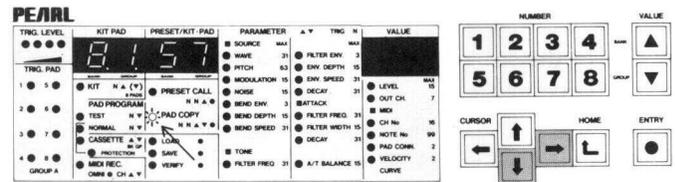
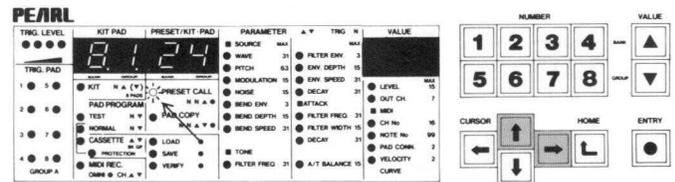
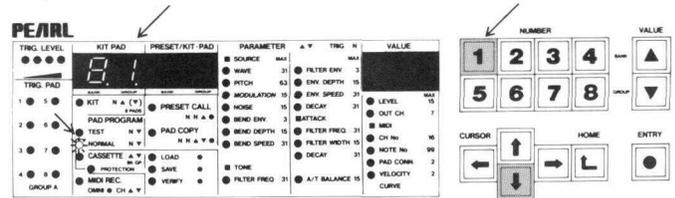
2. Switch OFF the PROTECTION on the rear panel. When switched, the corresponding Red LED light in the front display panel will go off.



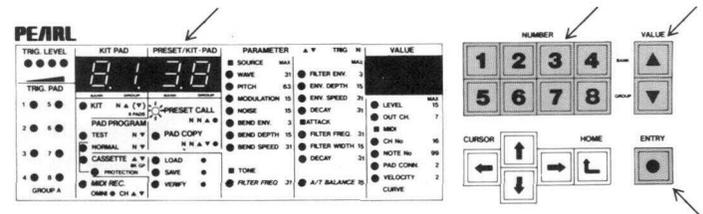
3. Move the CURSOR indicator to NORMAL of the PAD PROGRAM and select PAD 1 by pressing the correct NUMBER key. You can choose to either modify the timbres copied via PAD COPY or PRESET CALL or synthesize timbres by operating the Parameters.



4. Move the CURSOR indicator to PRESET CALL or PAD COPY.

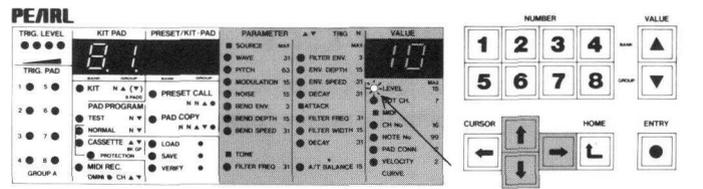


5. Referring to the FACTORY PRESET TIMBRE LIST or FACTORY PROGRAMMED KIT LIST, first choose the Timbre Number or Kit Pad numbers, respectively, then display them by pressing the correct NUMBER, BANK (Pad Copy/Preset Call) and GROUP (Pad Copy) keys, if so desired. Press the ENTRY key and the copying is carried out instantly. Without pressing the ENTRY key, the copying of either the PRESET CALL or PAD COPY will never be carried out.

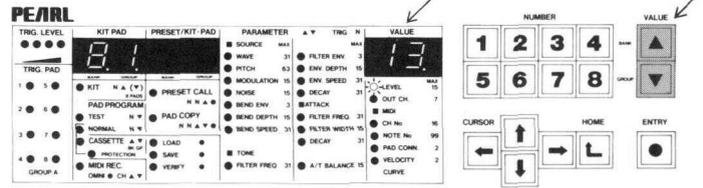


\*The values of the 16 parameters (governing the synthesizing of the timbre) from WAVE to A/T BALANCE are the only parameters (not the remaining 6 parameters from LEVEL to VELOCITY CURVE) that can be copied.

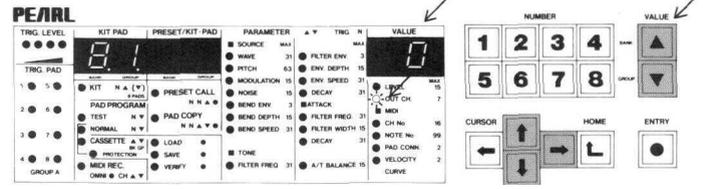
6. Move the CURSOR indicator to the desired PARAMETER you are going to modify. (See Parameter)



7. Press the VALUE keys to increase or decrease the value of the parameter desired.

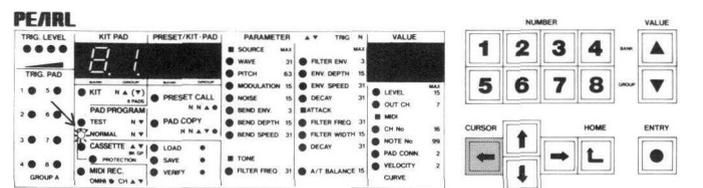


8. Move the CURSOR indicator to the next PARAMETER and change the value as desired.

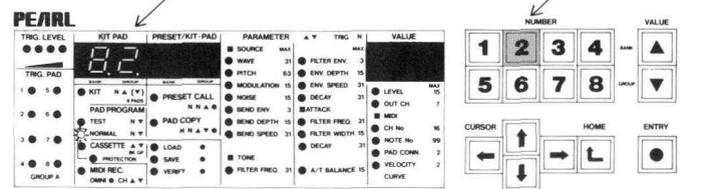


9. In the same operation as preceding, change the values of the remaining Parameters in order to synthesize the timbres as desired.

10. After completing the synthesizing, move the CURSOR indicator to NORMAL of the PAD PROGRAM.

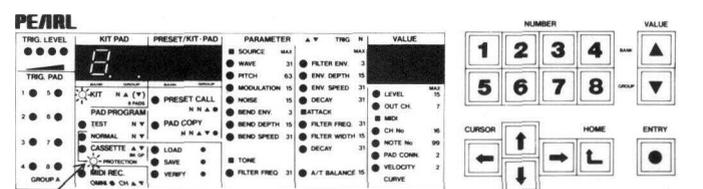
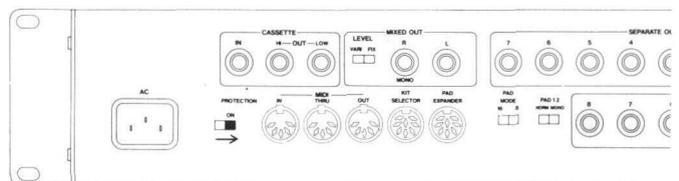


11. Next, by pressing the NUMBER key, select PAD 2 and then please follow the same operation to synthesize the timbre for PAD 2.



12. For Pads 3, 4, 5, 6, 7 and 8, please synthesize the timbre by following the entire previously mentioned procedure to complete the Kit.

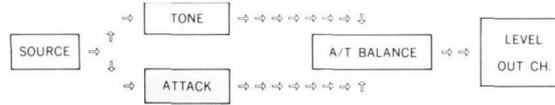
- While the CURSOR indicator is in the PARAMETER block and if the AC power is switched OFF during the synthesizing of timbre and before the CURSOR indicator is returned to KIT or PAD PROGRAM, the new timbres will not be memorized.
- » After finishing the reprogramming, please switch on the PROTECTION in order to protect all programs from being modified and/or erased by accidents or mistakes. While the PROTECTION is ON, the Red LED in the front display panel is lit.



# ◆ PARAMETER

Parameters are the factors from which the timbres are synthesized. The value of each of the parameters is assigned by the VALUE keys and the maximum parameter value is printed on the display panel.

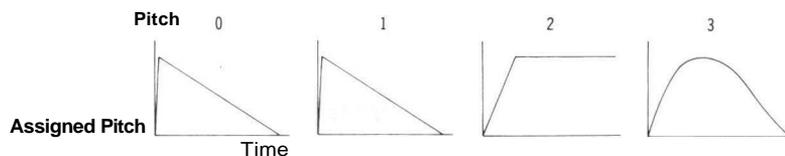
(Block Diagram)



## SOURCE

Parameters for the source to be processed in the TONE and ATTACK blocks.

- ◆ **WAVE** ————— The fundamental timbre is generated from the wave form. The wave form is selected by this parameter and 32 basic wave forms are in the SC-40 and SC-20. A variety of percussion timbre are accurately synthesized from the wave forms. (See the WAVE FORM LIST)
- ◆ **PITCH** ————— Pitch is assigned by the value keys and is variable from 0 to 63 every quarter note.
- ◆ **MODULATION** ——— The pitch is modulated in depth by noise and the value of the depth is assigned by the value keys. When the modulation is set at "0", depth is out of modulation control.
- ◆ **NOISE** ————— Level of noise to be mixed with the wave is assigned by the value keys.
- ◆ **BEND ENV.** ————— Bend Envelope is selected.
  - 0 ... Whether the pad is struck hard or soft, the pitch is bent down to the assigned pitch from the given depth higher than the said pitch.
  - 1 ... The harder the pad is struck, the higher the pitch starts and subsequently bent down.
  - 2 ... Pitch is bent up in the assigned depth from the assigned pitch.
  - 3 ... Pitch is bent up from the assigned pitch in proportion to how hard the pad is struck and bent down to the assigned pitch in proportion to the value of the Decay of the TONE parameters.

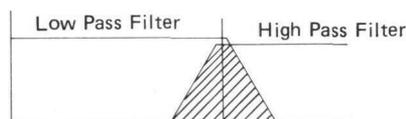


- ◆ **BEND DEPTH** ——— Bend depth is assigned. It's value is variable from 0 to 15. As the value increases, the depth increases correspondingly.
- ◆ **BENDSPEED** ——— Bend speed is assigned. It's value is variable from 0 to 31. As the value increases, the speed increases correspondingly.

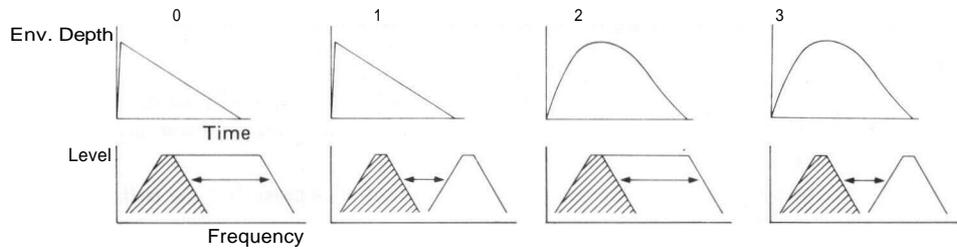
## TONE

Parameters of the sustain part of timbre.

- ◆ **FILTER FREQ.** ——— The cut-off frequency of the TONE circuit filter is assigned. The band pass filter consists of the low pass and high pass filters.



◆ **FILTER ENV.** ————— Cut off frequency of the low pass and/or high pass filters is modified by a pattern with the filter envelope. Pattern is selected.



◆ **ENV. DEPTH** ————— The depth of the filter envelope is controlled and as the depth increases, its value increases correspondingly.

◆ **ENV. SPEED** ————— The speed of the filter envelope is controllable and as the speed increases, its value increases correspondingly.

◆ **DECAY** ————— The decay of the TONE signal is controllable and as the length of the decay increases, its value increases correspondingly.

### ATTACK

Parameters of the Attack part of timbre.

◆ **FILTER FREQ.** ————— Cut-off frequency is controllable.

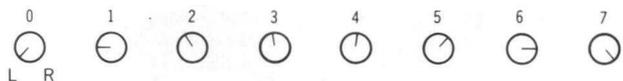
◆ **FILTER WIDTH** ————— Bandwidth is controllable.

◆ **DECAY** ————— The signal decay of the ATTACK circuit is controllable. And as the length of the decay increases, its value increases correspondingly.

◆ **A/T BALANCE** ————— The ratio of the signal level of the ATTACK portion of the timbre vs. the TONE portion is controllable and as the attack level increases, its value increases correspondingly.

◆ **LEVEL** ————— The output level for each pad is controllable.

◆ **OUT CH.** ————— When using the Separate Outs, the output channel can be assigned to each pad. Using the Stereo Out, allows you to pan each output signal, if so desired.



All signals are monitored in stereo by using a set of headphones, but please make sure that all signals are not panned to one side. When using the Mono Out, please assign all pads to channels 3 or 4.

### MIDI (See MIDI)

◆ **CH. No** ————— A MIDI out channel can be assigned, and a different channel can be assigned to each pad.

◆ **NOTE No** ————— When using either for the MIDI IN or OUT, a note number can be assigned.

◆ **PAD CONN.** ————— The MIDI out mode can be selected.

0 ... Only internal Tone Generator (SC-40 or SC-20) is triggered.

1 ... Only MIDI OUT is available.

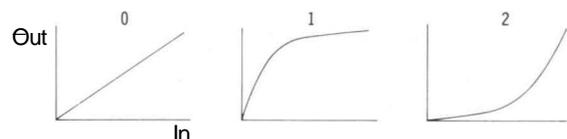
2 ... Both internal Tone Generator (SC-40 or SC-20) and MIDI OUT are available.

◆ **VELOCITY CURVE** — The MIDI velocity translation can be selected in both the MIDI OUT and IN.

0 ... Linear

1 ... Logarithm

2 ... Exponential



# ◆ RETAINING THE PROGRAMMED DATA

In the SC-40 and SC-20, the programmed data is put into the following four blocks:

- 1st Block . . . . . Bank A/Group A
- 2nd Block . . . . . Bank A/Group B
- 3rd Block . . . . . Bank B/Group A
- 4th Block . . . . . Bank B/Group B

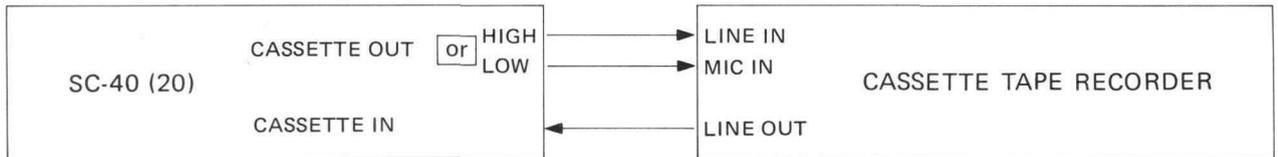
Any and all blocks of data can be transferred and retained on a cassette tape and then, in turn, be loaded into the SC-40 or SC-20.

\* Data Cassette Tape (DT-10)

The factory preset and programmed data in the previous four blocks are stored in that order on the DT-10 Data Cassette Tape.

## \* Connection

Connect the CASSETTE terminals on the rear panel of the SC-40 or SC-20 to a cassette tape recorder (See Diagram below).

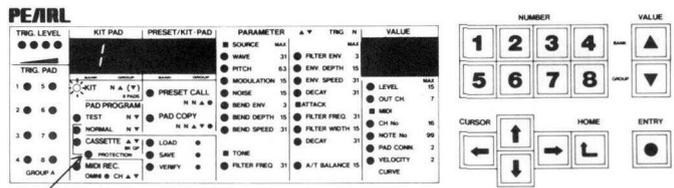


## \* Operation

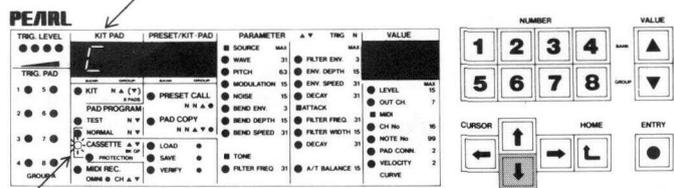
### I. Save

1. First connect the SC-40 or SC-20 to a Cassette Tape Recorder. Then turn both devices' AC power ON.

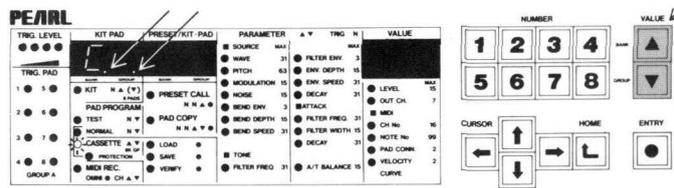
2. Switch the PROTECTION OFF and the Red LED indicator lamp in the front display panel goes off.



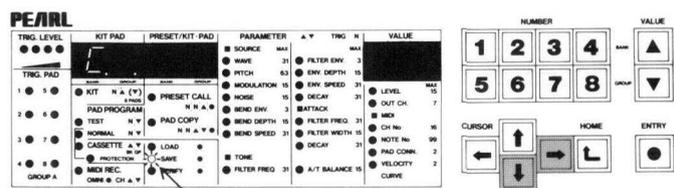
3. Move the CURSOR indicator to CASSETTE. The letter "C" is then displayed.



4. By pressing the respective BANK and GROUP keys, select the Bank (A or B) and Group (A or B) you desire.

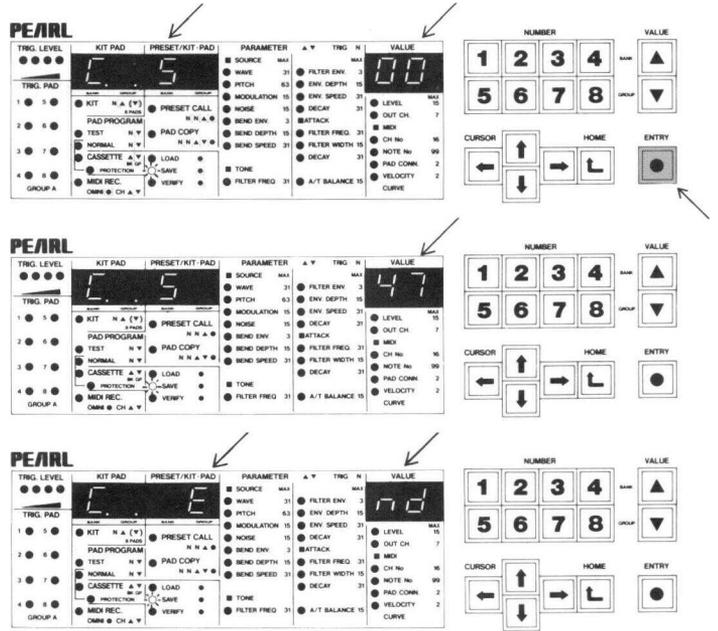


5. Move the CURSOR indicator to SAVE.



6. Put the Cassette Tape Recorder on Recording.

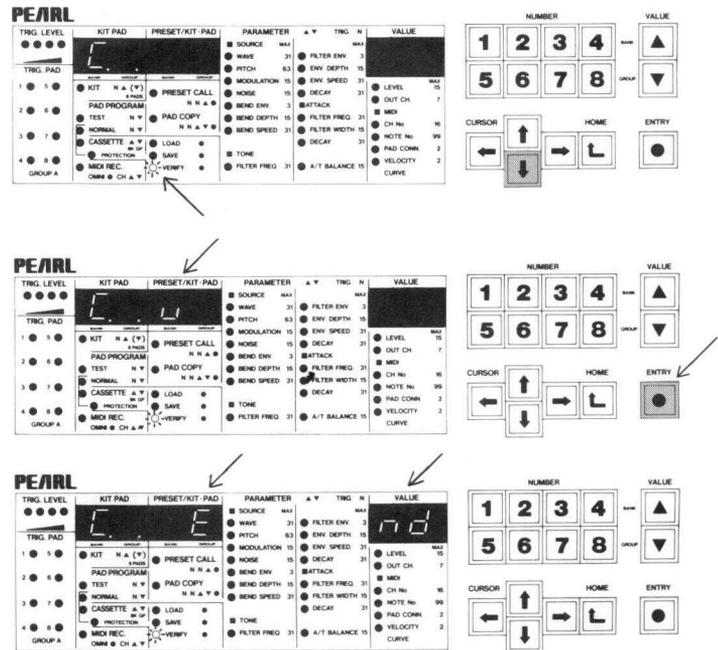
- After the leader tape section passes by the recording head of the tape recorder, please press the ENTRY key. The letter "S" and Value "00" are then displayed. After flickering about 14 seconds, the value "00" changes to "47" and then value "47" counts down to "00" in about 25 seconds. After the SAVE is finished, the word "End" is displayed.



\*By following the above operations, the retaining of the data is completed but to make sure, please check it with the following VERIFY operation.

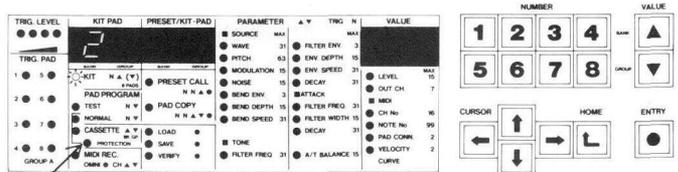
## II. Verify

- Rewind the cassette tape.
- Move the CURSOR indicator to VERIFY.
- Put the cassette tape recorder on play.
- Immediately after the LEADER TONE starts, press the SC-40 or SC-20's ENTRY key. The letter "v" is then displayed.
- After comparing the data and checking it to see that it has been correctly retained, the word "End" is then displayed. If something should go wrong, an ERROR message will be displayed in the PRESET/KIT PAD and VALUE column. In that case, please refer to the Error Message section to correct the problem, and then start the retaining of the data from the beginning again. (See Error Message)

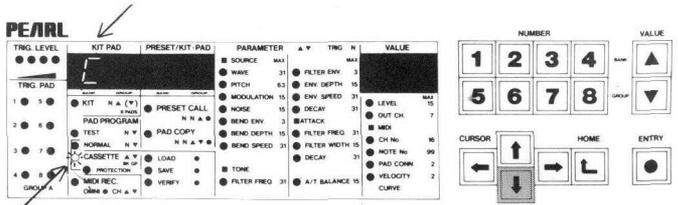


### III. Load

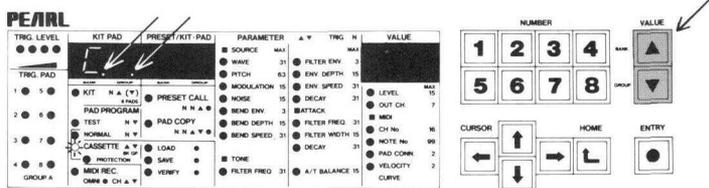
1. First connect the SC-40 or SC-20 to a cassette tape recorder. Then turn both devices' AC power ON.
2. Rewind the cassette tape.
3. Switch the PROTECTION OFF and the Red LED indicator lamp in the front display panel goes off.



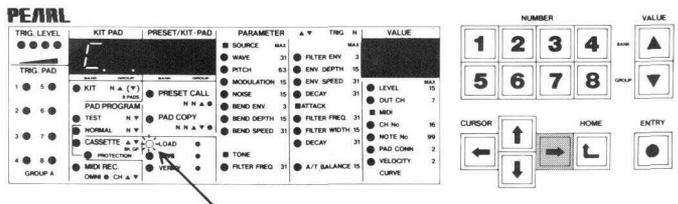
4. Move the CURSOR indicator to CASSETTE. The letter "C" is then displayed.



5. By pressing the respective BANK and GROUP keys, select the Bank (A or B) and Group (A or B) in terms of block of sounds you desire to load back.

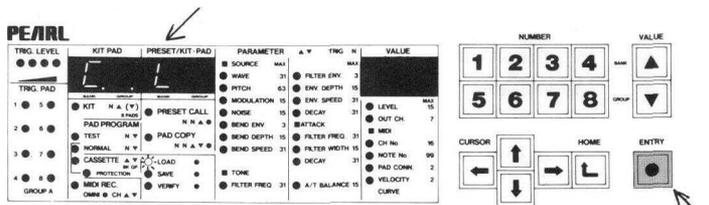


6. Move the CURSOR indicator to LOAD.

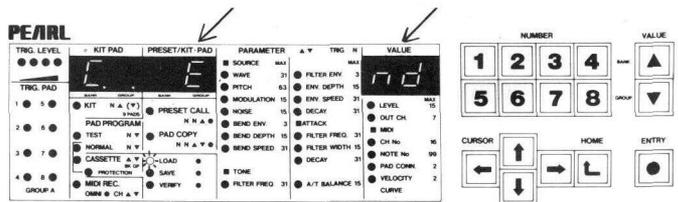


7. Put the cassette tape recorder on Play.

8. Immediately after the LEADER TONE starts, press the SC-40 or SC-20's ENTRY key. The letter "L" is then displayed.

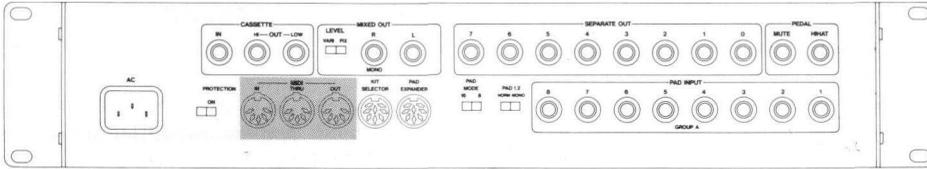


9. After the loading is finished, the word "End" is displayed. If something should go wrong, an ERROR message will be displayed in the PRESET/KIT PAD and VALUE column. In that case, please refer to the Error Message section to correct the problem, and then start the loading of the data from beginning again. (See Error Message)



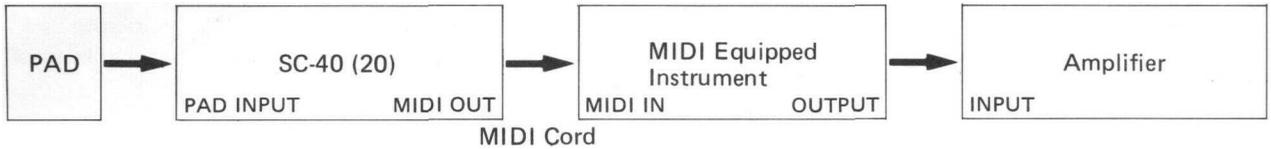
# ◆ MIDI

The SC-40 and SC-20 are MIDI equipped instruments and may be connected to other MIDI equipped instruments. By connecting the MIDI terminals of the SC-40 or SC-20 to MIDI terminals of other MIDI equipped instrument(s), the other MIDI equipped instrument's sound module can be played by Pearl's Electronic Drum Pads via the SC-40/SC-20 or the SC-40/SC-20 can be played by a MIDI controller such as a Keyboard, Sequencer, etc.



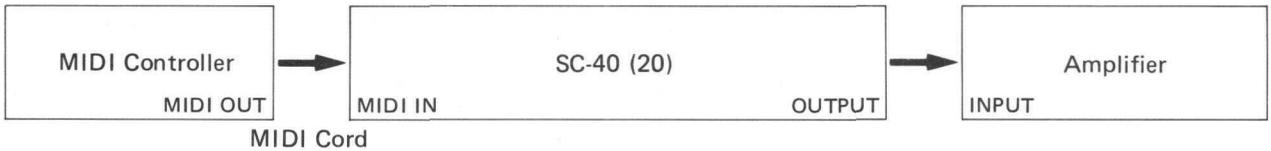
## \* Connection

1. To play another MIDI equipped instrument from a Pearl pad.



\*The time difference between Note-On and Note-Off MIDI signals transmitted from either SC-40 or SC-20 is extremely short in duration. Depending on the instrument used and its resulting signal timbre, the signal may not be voiced well. In order to correctly trigger another MIDI equipped instrument's sound, please make certain to assign the instrument's timbre which has a quick attack and long release time.

2. To play the SC-40 or SC-20 from a MIDI controller.



# \*MIDI Specifications

## ◆MIDI REC. (MIDI Recognition Mode)

The MIDI Recognition Mode (Omni On or Off) is selectable. Whenever the AC power is switched ON, the Omni On mode is automatically selected. By pressing the ENTRY key, either Omni On or Off can be selected. In the Omni Off mode, the MIDI signals of assigned channels are received in total (not for each pad).

## ◆Program Change

The MIDI Program change can be controlled by the Kit Selection in the transmission and vice versa in the recognition.  
» Program change information is transmitted through CH. 1 to CH. 8 (out of 16 channels).

## ◆CH No (Channel Number)

In the transmission, Channel Numbers can be assigned to each pad. A different MIDI sound module (or instrument) can be assigned to each pad.

## ◆NOTE No (Note Number)

The Note Numbers of MIDI equipped instruments and controller can be assigned to each pad. Please move the CURSOR indicator to the NOTE No. By pressing the VALUE keys, select the Note Number you desire to assign the pad. In order to carry out the assignment, please move the CURSOR indicator anywhere from the NOTE No. position. If the same Note Number is assigned to two (2) or more different pads in the Recognition, for example. Pad Number 8 (previously assigned) and Pad Number 2 (newly assigned), the Note Number is temporarily assigned to Pad Number 2. After that, when the AC power is switched OFF or the Kit Program is changed, the Note Number is reassigned to larger Pad Number.

The Note Number "0" is designed to mute the MIDI signal.

## ◆PAD CONN. (Pad Connection)

By pressing the VALUE keys, you can select the other MIDI instrument and/or SC-40(20) to be played from each pad.

0 ... .Only to trigger the internal tone generator of SC-40 or SC-20.

1 ... .Only MIDI OUT is available.

2 ... .Triggering of both the internal tone generator and MIDI OUT are available.

## ◆VELOCITY CURVE

The velocity translation curve pattern is selected in the MIDI OUT and IN.

<CTerminals^>

## ◆MIDI IN

Terminal to receive the MIDI signal.

## ◆MIDI THRU (MIDI Through)

MIDI information received from an external MIDI controller can be passed through to another external MIDI controller.

## ◆MIDI OUT

Terminal to transmit out the MIDI signal.

# SPECIFICATIONS

- TONE GENERATOR: DWAP (Digital Wave Analog Processing)  
2 WG, 4VCF (LPx2, HPx2), 4 EG
- SIMULTANEOUSLY GENERATED SOUND SIGNALS: 4 (SC-40), 2 (SC-20)
- PAD INPUT NUMBER: 8 (SC-40/20)  
16 (SC-40/20 with PE-8 Pad Expander Unit)
- PROGRAM MEMORY: 8 pads x 32 or 16 pads x 16
- PRESET TIMBRE: 128
- FUNCTION: Pad Program (Preset Call, Pad Copy, Parameter Edit- 18 Parameters, MIDI Transmission)  
Cassette Tape (Load, Save, Verify)  
MIDI Recognition Channel (Omni mode ON/OFF)
- INPUT/OUTPUT: Pad Inputs 8, Pedal Inputs 2 (Hi-Hat, Mute)  
Output (Separate Out 8 <0 to 7 ch>. Mixed Out R + L), Pad Expander,  
Kit Selector, MIDI (In, Out, Thru), Headphone (Stereo)
- CONTROL: Control Keys 16, Mode Switches 4 (Pad 1, 2 Mode, Pad Number Mode, Output Level Fix/Vari, Protection),  
Sense 8, Volume
- DIMENSION: 19"(W) x 17"(D) x 3-7/10"(H) or 483(W) x 420(D) x 94(H) mm, Rack Mountable (EIA-2U)
- WEIGHT: 15 IDS. 6 oz. or 7kg
- ACCESSORIES: AC Cord, Connecting Cord (Output) x 1, DIN Cord (MIDI) x 1,  
DT-10 Data Cassette Tape x 1

## ◆ CURSOR INDICATOR POSITION, KEY OPERATION AND DISPLAY LIST

Location of the CURSOR indicator	Operation Keys	Display			Remarks
		KIT PAD	PRESET	VALUE	
KIT	[N] BANK [▲] GROUP [▼]				GROUP key is effective in the 8 pads' mode.
TEST	[N] GROUP [▼]				
NORMAL	[N] GROUP [▼]				The kit number is selectable when the CURSOR indicator is located at KIT.
CASSETTE	BANK [▲] GROUP [▼]				
MIDI REC.	VALUE [▲] [▼]				Omni On/Off is selectable. In the Omni Off mode, Channel Number is displayed in the VALUE column.
PRESET	[N] [N] BANK [▲] ●				By pressing the NUMBER key again, the figure in the right hand column is shifted to the left hand column and the new number is displayed in the right hand column.
COPY	[N] [N] BANK GROUP [▲] [▼] ●				
LOAD	●				The word "End" is displayed after loading, retaining, or verifying is completed. If something goes wrong, an Error message is displayed. When saving, after flickering, value "00" changes to "47", then the value "47" counts down to "00".
SAVE	●				
VERIFY	●				
PARAMETER	VALUE [▲] [▼] (N)				While the CURSOR indicator is located in the Parameter block, the NUMBER keys can be used as manual trigger keys.

# ◆ ERROR MESSAGE

Displayed Message	Error	Instruction
	Too low a level.	Increase the output level of the tape recorder.
	The tape started at the wrong position.	Start the tape at the correct place.
	(A) Too low a level. (B) Tape recorder's output signal is equalized incorrectly.	(A) Increase the output level of the tape recorder. (B) Equalize the output signal to make it flat.
	(A) Too low a level. (B) Tape recorder's output signal is equalized incorrectly.	(A) Increase the output level of the tape (B) Equalize the output signal to make it flat.
	Retaining the data is incorrect.	Retain the data correctly.
	The tape data is not the same as the data stored in the SC-40 or SC-20.	Retain the data correctly,

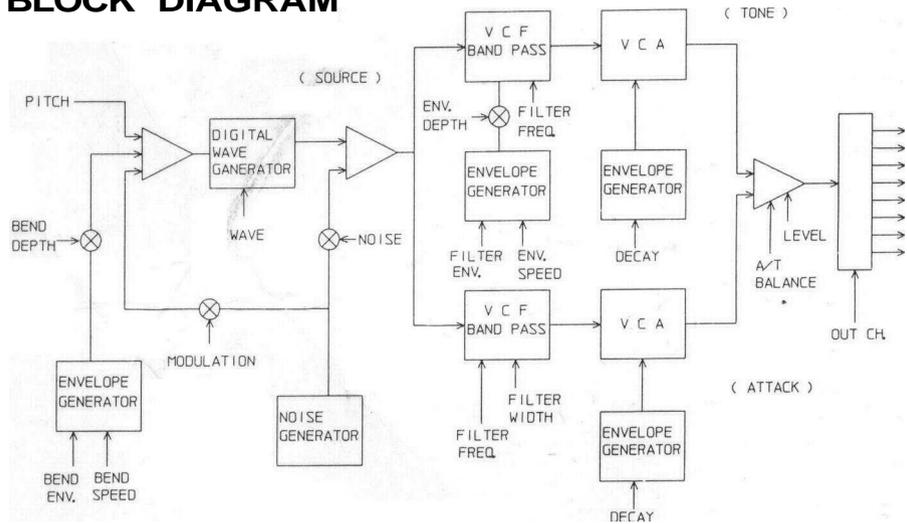
# PROGRAMMABLE PERCUSSION SYNTHESIZER

## Model SC-40, SC-20 MIDI IMPLEMENTATION CHART version: 10

Function. . .		Transmitted	Recognized	Remarks
Basic	Default	1—16	1—16 >	Memorized
Channel	Changed	1-16	1-16	
	Default	Mode 1	Mode 1	
Mode	Messages	X •	OMNI ON/OFF	OMNI ON/OFF is selectable on the front panel.
	Altered	* * * * *		
Note		1-99	1-99	0 for Muting
Number:	True voice	* * , * * * * » * „ * *		„- ,
Velocity	Note ON	O9nHv=1-127	O9nHv=1-127	
	Note OFF	X 9nH v=0	X 9nHv=0, 8nH	;
After	Key's	X	X	
Touch	Ch's	X	X	
Pitch Bender		X	X	
		X	X	
Control				
Change				
Prog		O 0—31	O 0—127	Transmission via
Change:	True #	„ „ * * , , * , « „ , *	<b>Q-31</b>	CH. 1-CH.8
System' Exclusive		X	X	
System	Song Pos	X	X	
	SongSel	X	X	
Common	Tune	X	X	
System	Clock	X	X	
Real Time	Commands	X	X	
Aux	Local ON/OFF	X	X	
	All Notes OFF	X	X	
Messages	Active Sence	X	X	
	Reset	X	X	
Notes				

# SC-40 / SC-20

## BLOCK DIAGRAM



## WAVE (Wave Form)

VALUE	TIMBRES
0	Electronic Drum, Sine Wave
1	Electronic Drum w/Attack Sounds
2	Electronic Drum w/Beat Sounds
3	Acoustic Drum w/Metallic Sounds
4	Normal Acoustic Drum
5	Acoustic Drum w/Less Overtones
6	Acoustic Drum w/Increased Overtones
7	Snare Drum
8	Timbale
9	High Pitch Drum
10	Ride Cymbal
11	Bell Sounding Cymbal
12	Crash Cymbal
13	Hi-Hat Cymbal
14	China Cymbal
15	Gong
16	Effect, Sine Wave
17	Vibes, Lower Pitch Notes
18	Vibes, Higher Pitch Notes
19	Xylophone, Lower Pitch Notes
20	Xylophone, Higher Pitch Notes
21	Triangle
22	Chime
23	Claves
24	• Wood Block
25	Reverberation Effect
26	Echo-Effect
27	Cowbell
28	Steel Drum
29	Piano, Lower Pitch Notes
30	Effect w/Noise, Type 1
31	Effect w/Noise, Type 2

## BEND ENV.

VALUE	ENVELOPE MODE	TRIGGER SENSE
0		OFF
1		ON
2		OFF
3		ON

## FILTER ENV.

VALUE	ENVELOPE MODE	FILTER MODE
0		
1		
2		
3		

## PAD CONN.

## VELOCITY CURVE

VALUE		VALUE	
0	Internal	0	Linear
1	MIDI OUT	1	Logarithm
2	Both	2	Exponential

