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LOCATION OF CONTROLS / パネル配置図

Display Cover (51403670)

7-SEG LED (13060018)

LED SO-250-700G (13060019)

LED SO-250HF (13060020)

LED SO-250G (13060021)

Switch EVO/1300M (13160001)

Rubber Switch (13160010)

Top Case Assy (13160008)

Reducer Switch (13160010)

Rear Panel (51403808)

Volume Knob (22485169)

Rotary Volume (13288226)

Jack (Monaural) (13498286)

Jack (Stereo) (13498273)

ON Socket (13498274)

Slide Switch (13160025)

Key Top (Black) (13289171)

Power Switch (13289168)

Bottom Case Assy (13160009)

Weight............................................................

Dimensions/寸法................................................

Power Supply ....................................................

Current Draw ....................................................

Dimensions/寸法................................................

Weight/重量......................................................

Accommodations/収納..........................................
CIRCUIT DIAGRAM / 回路图
LOADING THE FACTORY PRESET DATA
/ ファクトリープリセット・データのロード方法

Perform this procedure after repairs or to replace the RAM to its factory preset status. This procedure will delete all data currently written to RAM and replace them with the factory preset data.

1. Set the Device ID number (=Basic Channel) on Which the RAM to its factory preset status. This procedure will delete all data currently written to RAM and replace them with the factory preset data.

2. Press the [ALL/ENTER] key to execute initialization.

NOTE: In some devices, the MIDI channel number and the Device ID number can be set independently, and will not necessarily be the same. When transferring bulk data with another device, refer to the operating manual for that device.

<How to transmit (Bulk Dump)>:

Here’s how to transmit the memory data of the SPD-20.

1. Set the Device ID number (=Basic Channel) on Which the RAM to its factory preset status. This procedure will delete all data currently written to RAM and replace them with the factory preset data.

2. Use [A], [V] to select the SYSTEM parameter BULK DUMP.
3. Use [PATCH/VALUE] to select the patch data you wish to transmit (ALL1 ~ 99). If ALL is selected, all Patch data, Patch Chain data, and system parameter data will be transmitted at once.

4. Set the receiving MIDI device so that it will be able to receive Exclusive messages.

5. Press [ALL/ENTER] and data transmission will begin.

   - Time required of transmitting data
     All patch data -----------about 65 sec
     One patch data -----------about a sec

If you wish stop the operation during transmission, press [EDIT].

6. If you wish to transmit other Patch data, repeat steps 3 - 5.

7. Press [EDIT] to return to play mode.

   <How to receive (Bulk Load)>

   Here's how to receive Patch data that was stored in another SPD-20 or in a sequencer.

   Make connections between [MIDI IN] of the transmitter and [MIDI OUT] of the receiver.

   **NOTE:** When data is received, the previous settings will be lost.

   1. Make sure that the MIDI channel of the transmitting device matches the Basic channel of the receiving SPD-20 (refer to "How to transmit")

   If you transfer Exclusive data from another SPD-20, set the basic channels on both units match.

   If you receive the Exclusive data that was stored in a sequencer, set the basic channel to match the same number which was set when you saved data in the sequencer.

   2. Press [EDIT] to edit mode.

   3. Transmit the Exclusive data from the other MIDI device. When reception begins the following display will appear.

   4. Press [EDIT] to return to play mode.

   * Exclusive data transmission can require a significant amount of time, so allow a reasonable time for these operations. Data cannot be transmitted while incoming Bulk data is being processed, nor can data be received while Bulk data is being transmitted.

   If bulk data (Exclusive data) is received during Patch play mode, the SPD-20 will return to normal play mode when reception ends.

   **NOTE:** If the selected channel of the receiving device matches the Basic channel of the receiving SPD-20, Exclusive messages will be received. If the selected channel of the receiving device does not match the Basic channel of the receiving SPD-20, data will not be received.

   **INDENTIFYING THE VERSION NUMBER/バージョン確認方法**

   The ROM version can be checked on the "Version check" in "Test Mode". However, it can also be checked with the following procedure.

   1. Turn on the power supply while pressing both the [SELECT] and [EDIT] keys at the same time. The following will be displayed on the 7-segment LED.

   The displayed ROM version number is for the EP-ROM (IC10 on CPU Board).

   2. Select the patch data you wish to transmit (ALL/1 ~ 99). If ALL is selected, all Patch data, Patch Chain data, and system parameter data will be transmitted at once.

   **CHECKING BATTERY VOLTAGE/電圧の確認方法**

   Use this procedure to check the voltage of the lithium battery.

   1. Hold down [FX OFF] and [FX ON/OFF] keys simultaneously, turn on power.

   The LED display will show the status of the lithium battery.

   **NOTE:** The battery is also monitored during operation and causes the error message if it goes below 2.2V. (Refer to "ERROR MESSAGES" section.)

   2. To return to the operation mode, press any key.

   * If the battery voltage is below 2.2V, the battery needs an exchange.

   **NOTE:** Be sure to check the battery voltage before using the device.

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**TEST MODE / テストモード**

---

< CAUTION >

The user data will be erased once the unit enters the test mode. Be sure to save the user data before accessing the test mode. Refer to "DATA SAVE AND LOAD" section.

Tools and materials

- Monitor speakers
- MIDI cable
- Foot switches (FS-5U) x 2
- Connection cable (PCS-31)
- Pad (PD-7,PD-120)
- Monaural cable
- Hi-Hat control pedal (FO-7)
- Pad (PD-7,PD-120)
- Monaural cable
- Hi-Hat control pedal (FD-7)
- Stereo cable

Make connections as shown in the following diagram.

Fig. 1

Entering test mode

While pressing [ALL/ENTER] and [EDIT] keys simultaneously, turn power on. The 7-seg LED will display as follows.

```
1111
```

This display is "TEST MENU".

If not all tests succeeded, the display shows as follows.

```
N G
```

RAM NG:

```
N G
```

WAVE ROM NG:

```
N G
```

BATTERY NG:

```
N G
```

(The test mode is stopped.)

Exiting test mode

Press [ALL/ENTER] key while in the test menu of the test mode. The following display will appear and it will blink. After that SPD-20 exit the Test mode automatically.

```
bye
```

Test procedure

1. Version check

Press [SELECT] key, the 7-seg LED will display the version number.

```
100
```

fig. 7 (1.00......Version number)

Press [SELECT] key the display returns to the test menu.

---

<注意>

テストモードを実行すると、ユーザー・データが消去されることがあります。テストモードを開始する前に、必ずデータのセーブを行ってください。

データのセーブ/ロードの方法については「DATA SAVE AND LOAD」セクションを参照してください。

---

Fig. 2

Make connections as shown in the following diagram.

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

(Apr, 1998)

SPD-20

---

Make connections as shown in the following diagram.

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7
During the subsequent tests, the number of segments being its is decremented by after returning to the menu screen from a test.

2. LED check
Press [PATCH CHAIN] key to start the LED test. Verify that all LED turn on, one at a time. When all the segments have turned on, press [PATCH CHAIN] key.

3. SW check
Press [COPY] key and the display changes as follows: Press 12 keys on the right hand of the front panel one by one. Segments of the LED will be turned off, one at a time for a key pressed. When all keys are pressed, the 7-seg LED will show YES and then return to the menu.

4. FOOT SW check
Connect FOOT SW socket to the foot switch via the cable PCS-31. Press [EDIT] key and the 7-seg LED will show: Depress the pedals on the foot switch, one at a time. As follows if the pressed pedal is good: Then the 7-seg LED will show YES before returning to the menu.

5. MIDI check
Connect the MIDI IN to MIDI OUT using the MIDI cable. Press [ ] key to start the MIDI circuit test. When the MIDI circuitry is good, the 7-seg LED shows YES and returns to the menu.

6. TRIGGER INPUT check
Set TRIG4/HH CTRL selector switch on the rear panel to TRIG4 position. *TRIGGER CIRCUIT check Hit head of PD-7 one by one and listen to the speakers. Verify all jacks are correctly localized(panning).

7. RIM A/D check
Press [LAYER] key. The 7-seg LED will change as follows: A monaural cable into TRIG1 ~ 4 jacks one by one. As follows if this check is good: Now the 7-seg LED should show YES and return to the menu.

*TRIG4/HH CTRL selector switch on the rear panel to TRIG4 position.

*RIM CIRCUIT check Press [BANK A/B] key. The 7-seg LED will change as follows:

SOUND NAME PAN
TRIG1 Kick hard left
TRIG2 Snare hard right
TRIG3 Darbuk hard left
TRIG4 Cymbal hard right

RIM CIRCUIT check
Press [LAYER] key. The 7-seg LED will change as follows: A monaural cable into TRIG1 ~ 4 jacks one by one. As follows if this check is good: Now the 7-seg LED should show YES and return to the menu.
Connect TRIG1 jack to the PD-120 via the stereo cable. Hit rim of the PD-120, the 7-seg LED will change as follows:

![fig. 17](image1.png)

Connect TRIG2 jack to the PD-120 via the stereo cable. Hit rim of the PD-120, the 7-seg LED will change as follows:

![fig. 18](image2.png)

Press [LAYER] key the display returns to the test menu.

8. HI-HAT CONTROL check

Connect the Hi-Hat control pedal (FD-7) to SPD-20 HH CTRL/TRIG4 socket via the monaural cable.

*Set HH CTRL/TRIG4 switch to HH CTRL.

Press [FX ON/OFF] key, the 7-seg LED will change as follows:

![fig. 19](image3.png)

After entering the test mode, depress the control pedal. The 7-seg will first read a value X (fluctuating) and should read 0 at a maximum pressure.

Press [FX ON/OFF] key the display returns to the test menu.

9. CROSS TALK check

Press [¬] key. The 7-seg LED will change as follows:

![fig. 20](image4.png)

The displayed number represents a pad. The [PATCH/VALUE+] keys scroll pads 1 through 8. Hit the pad being displayed. No output sound means the circuitry is good.

If the pad causes crosstalk sound, the display will indicate:

![fig. 21](image5.png)

(The number of pad being checked on this display.) 表示されている数字は、現在チェックしているパッドを示す。

Unit segments indicate non-crosstalk pads and one being checked.

![fig. 22](image6.png)

Press [¬] key and the display return to the test menu.

10. VELOCITY check

Press [-PATCH/VALUE] key. The 7-seg LED will change as follows:

Press the head of the 8 pads on the SPD-20 and observe the velocity readings on the LED display. The highest readings should be 127.

After completion of the test, press [¬] key and the display return to the test menu.

After completion of all tests, press [ALL/ENTER] key and the 7-seg LED returns to the operation mode after displaying messages shown in (fig. 5).
If a problem occurs during operation, an error message will be displayed. Check which error message is displayed, and take the appropriate action as described in this section.

**Act SENs Err**

- The MIDI cable connecting another MIDI device to the SPD-20 is not connected correctly or may be broken.
  - Check the MIDI cable and the connections with the other device.

- Other cable and those connected to the SPD-20 have not been interrupted completely or not by miswiring.
  - Confirm the MIDI wire and the connection status with the other device.

**Load Err**

- Bulk Data loading was not successful.
  - Try loading once again.
  - Press any button on the front panel and previous display will reappear.

**SEr, AL Err**

- MIDI data was received incorrectly.
  - Press any button on the front panel and previous display will reappear.

- An irregularity in the voltage of the pad detection circuit.
  - The VCCIC15,IC16 or peripheral circuits may be at fault.
  - Press any button on the front panel and previous display will reappear.

**BUFFER FULL**

- Too much MIDI data was received from another MIDI device.
  - Reduce the amount of MIDI data transmitted by the other device.
  - Or, retransmit the data after an interval to reduce the amount of MIDI data transmitted in a short time.
  - Press any button on the front panel and previous display will reappear.

**ran TEST Err**

- The memory data inside the SPD-20 has been lost.
  - Press any button on the front panel. All data will be initialized, and the normal display will reappear.
  - If this happens, all the data in the SPD-20 will be reset to the factory preset settings.

- This indicates that there is an irregularity in the voltage of the pad detection circuit.
  - VCCIC15,IC16 or peripheral circuits may be at fault.
  - Press any button on the front panel and previous display will reappear.

**NOTE**

- Sometimes this error message will appear if you strike a pad while turning on the power. In this event, turn the power on once again.

- The memory backup battery inside the SPD-20 has run down.
  - Have the battery replaced.
  - Press any button on the front panel and previous display will reappear.

---

**How to exchange the Sensor and the Sensor Assy**

1. Refer to the following for sticking positions of Sensor Assys.

   - **Hollow**
     - (To Decide The SENSOR Position)
     - Θ<=(θ)

2. Press the Sensor Assy to an approximately 3-Kg load for 2 seconds after sticking the sensor assy.
Preventing mistriggering of two pads tapped simultaneously

When you tap two internal pads simultaneously they may positively trigger the sound. If this is the case, follow the steps described below.

This information is not found in the Owner’s manual.

1. Holding BANK A/B and LAYER, turn on the power switch. The display will read 70 which is the factory setting.

2. This value is the “crosstalk cancel” level set for the internal pads.

Change this value to 50 by pressing PATCH/VALUE [+][-]. Decreasing this value minimizes the chance of missing sound but increases the chance of crosstalk.*1 The reverse holds true.

*1 Crosstalk: A tap of a pad will cause a different pad to trigger its sound source. A pad on the SPD-20 tends to cause crosstalk when it is not tapped at the center.

Note: With the crosstalk cancel set at 50, strong tapping of a pad at outer portion (from 2 cm from periphery) will cause a crosstalk. Ask the user how he plays the pads and adjust the cancel level in the range of 60 to 70.

CAUTION: Pads are disabled during setting sequence of the crosstalk cancel level.

3. Turn off power.

The setting is memorized and will be made effective as you turn on the SPD-20 next time.

Remarks: Mistriggering is more likely to occur as two pads are tapped at the same time and with uneven forces (or out of the center of the pad). To reduce mistriggering: Tap pads at the center with same force or not at the same time.

To set the crosstalk cancel level of the pads connected to the TRIGGER INPUT of the SPD-20, refer to p.53 of the Owner’s manual.

Step 1: Press BANK A/B and LAYER. The display will read 70 which is the factory setting.

Step 2: This value is the “crosstalk cancel” level set for the pads connected to the TRIGGER INPUT.

Change this value to 50 by pressing PATCH/VALUE [+][-]. Decreasing this value minimizes the chance of missing sound but increases the chance of crosstalk. *1 The reverse holds true.

*1 Crosstalk: A tap of a pad will cause a different pad to trigger its sound source. A pad on the SPD-20 tends to cause crosstalk when it is not tapped at the center.

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This information is not found in the Owner’s manual.

1. Holding BANK A/B and LAYER, turn on the power switch. The display will read 70 which is the factory setting.

2. This value is the “crosstalk cancel” level set for the internal pads.

Change this value to 50 by pressing PATCH/VALUE [+][-]. Decreasing this value minimizes the chance of missing sound but increases the chance of crosstalk. *1 The reverse holds true.

*1 Crosstalk: A tap of a pad will cause a different pad to trigger its sound source. A pad on the SPD-20 tends to cause crosstalk when it is not tapped at the center.

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2. This value is the “crosstalk cancel” level set for the internal pads.

Change this value to 50 by pressing PATCH/VALUE [+][-]. Decreasing this value minimizes the chance of missing sound but increases the chance of crosstalk. *1 The reverse holds true.

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To set the crosstalk cancel level of the pads connected to the TRIGGER INPUT of the SPD-20, refer to p.53 of the Owner’s manual.
### IC DATA / データ

**MB -> Main Board Assy (pcb 22935470 1/3)**  
**PB -> Panel Board Assy (pcb 22935470 2/3)**

<table>
<thead>
<tr>
<th>Component</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photo Coupler (IC17 on MB)</td>
<td>PC-410 (15289125)</td>
<td></td>
</tr>
<tr>
<td>Oscillator (X1 on MB)</td>
<td>SG-8002 (01453945)</td>
<td></td>
</tr>
<tr>
<td>+5V Voltage Regulator (IC27 on MB)</td>
<td>µPC78L05J (15199231)</td>
<td></td>
</tr>
<tr>
<td>Transistor (Q1, 2, 28 on MB)</td>
<td>2SA1037KR (15309101)</td>
<td></td>
</tr>
<tr>
<td>Transistor (Q37 on MB)</td>
<td>2SB1184R F5 (15309605)</td>
<td></td>
</tr>
<tr>
<td>-5V Voltage Regulator (IC25 on MB)</td>
<td>µPC79L05J (15199233)</td>
<td></td>
</tr>
<tr>
<td>Transistor (Q9 to 22 on MB)</td>
<td>DTA114EK (15329507)</td>
<td></td>
</tr>
<tr>
<td>Transistor (Q3, 6, 7, 8 on CB)</td>
<td>DTC343TK (15329514)</td>
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<tr>
<td>Transistor (Q301, 302, 303 on PB)</td>
<td>DTC114EK (15329516)</td>
<td></td>
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<tr>
<td>Transistor (Q4, 5 on MB)</td>
<td>2SK208Y (15329105)</td>
<td></td>
</tr>
<tr>
<td>Transistor (Q23 to 27, Q29 to 36)</td>
<td>2SC2412KR (15319101)</td>
<td></td>
</tr>
<tr>
<td>FET (Q4, 5 on MB)</td>
<td>2SK208Y (15329105)</td>
<td></td>
</tr>
</tbody>
</table>

#### Component Diagrams

- **IC17 Photo Coupler**
  - Anode
  - Cathode
  - GND
  - V0
  - VCC

- **X1 Oscillator**
  - Q1
  - GND
  - OUT
  - VDD

- **IC27 +5V Regulator**
  - µPC78L05J
  - µPC79L05J

- **Q1 Transistor**
  - Q1
  - Collector
  - Emitter

- **Q22 Transistor**
  - Q22
  - Collector
  - Emitter

- **Q28 Transistor**
  - Q28
  - Collector
  - Emitter

- **Q29 Transistor**
  - Q29
  - Collector
  - Emitter

- **Q36 Transistor**
  - Q36
  - Collector
  - Emitter

- **Q4 FET**
  - Drain
  - Source
  - Gate

- **Q5 FET**
  - Drain
  - Source
  - Gate

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*Apr, 1998*