SPECIFICATIONS／仕様

AD-5: ACOUSTIC INSTRUMENT PROCESSOR

- AD Conversion/AD変換: 21 bit AF Method
- DA Conversion/DA変換: 20-bit Input, 4 Times Oversampling Digital Filter + ΔΣ Method
- Sampling Frequency/サンプリング周波数: 44.1 kHz
- Nominal Input Level/規定入力レベル: INPUT: -10 dBm, INSERT (RETURN): -10 dBm
- Input Impedance/入力インピーダンス: INPUT (PIEZO): 4.7 Mohm, INPUT (MAGNETIC): 1 Mohm, INSERT (RETURN): 100 kohm
- Nominal Output Level/規定出力レベル: OUTPUT: -10 dBm, OUTPUT (Balanced): -10 dBm into 600 ohm, INSERT (SEND): -10 dBm
- Output Impedance/出力インピーダンス: OUTPUT: 2 kohm, OUTPUT (Balanced): 600 ohm, INSERT (SEND): 1 kohm
- Indicators/インジケータ: POWER, PEAK, EFFECTS BYPASS, 2x2 CHORUS, REVERB
- Connectors/接続端子: INPUT Jacks (PIEZO, MAGNETIC), INSERT Jack (1/4 inch TRS Phone Type), OUTPUT Jacks L (MONO), R, OUTPUT Connectors L, R (XLR-3-32 Type), REMOTE Jack, AC Adaptor Jack

- Power Supply/電源: DC 9V (Roland ACL or ACB-Series)
- Current Draw/消費電流: 300 mA
- Dimensions/外形寸法: 150(W) x 155(D) x 65(H) mm, 5 15/16(W) x 6 1/8(D) x 2 9/16(H) inches
- Weight/重量: 1.0 kg (excluding the AC Adaptor), 2 lbs 4 oz
- Accessories/付属品: Owner's Manual (Japanese 70901723), English (70901823), AC Adaptor (ACI-100C (00905756), ACI-120C (00905767), ACI-230C (01018312), ACB-240(E) (12449564), ACB-240(A) (12449549)
- Options/別売品: Foot Switch: FS-SU, Cord: Roland PCS-31 (1/4 inch TRS Phone Type - 1/4 inch Phone Type x 2)

* 0 dBm = 0.775 Vrms
LOCATION OF CONTROLS / パネル配置図

Cannon
NC3MAH
(00679767)

Slide Switch (NDR-INV)
SSSF012-SS9ND
(01230489)

P R-KNOB SF BLK/LCG
(22480305)
RK09K113 100KB-CC
(01230523)

P R-KNOB MF BLK/LCG
(22480305)
RK09K113 100KB
(01230512)

LED (Red)
LN282RPX
(00124601)

D S-KEYTOP MX1H BLK
(22485274)
Tact Switch
SKQKAA
(01231034)

LED (Red)
LN282RPX
(00124601)

P R-KNOB MF BLK/LCG
(22480260)
RK09K113 250KD
(01230501)

Jack
LGR4619-8000
(01230490)

G S-BUTTON S1H BLK
(1249175)
Push Switch
SPUN19430A
(13125969)

Adaptor Jack
HEC2305-01-250
(13449720)

BOTTOM COVER
(01230434)

Slide Switch (STEREO-MONO)
SSSF112-PO850
(01230223)
EXPLODED VIEW／分解図

[PARTS]
No.  PART No.  PART NAME
1  01230423  TOP COVER
2  01230434  BOTTOM COVER
3  01230435  VR BOARD ASSY
4  01230436  OUT JK BOARD ASSY
5  01230437  IN JK BOARD ASSY
6  01230438  MAIN BOARD ASSY
7  22480274  D S-KEYTOP MX1H BLK
8  12491752  G S-BUTTON S/H BLK
9  22480305  P R-KNOB 9F BLK/LCG
10 22480290  P R-KNOB MF BLK/LCG
11 23530313  AMDEK FOOT MKS

[SCREW]
No.  PART No.  PART NAME
a  40011390  Binding Taprite S W/INT TW 3x6 S BZC
b  40012512  Binding Taprite S 3x6 ZC
c  40013066  Pan Machine Screw W/SW+PW 1.6 M3x6 ZC
d  40010412  Binding Machine Screw W/INT TW 3x6 BZC
e  40011312  Binding Taprite P 2.6x8 BZC
TEST MODE / テストモード

Test Items
1. LED Check
2. EFFECTS BYPASS key and Remote Jack Check
3. VR Check(except INPUT LEVEL)
4. DSP Check
5. Output Frequency Response Check
6. Output Mute Check
7-1. Residual Noise and Shock Noise Check(DSP Thru)
7-2. AF-AD Check
7-2. INPUT LEVEL VR and Total Frequency Response Check(DSP Thru)
7-3. PHASE SW Check
7-4. PEAK LED Check
7-5. INSERT Jack Check

Equipment Required
- Foot SW: FS-SU x2 or equivalent
- STEREO: MONO x2(Tip and Ring) Cord: PCS-31 or equivalent
- Multiple Jack: J-5 or equivalent
- Cannon Cable
- Opened Plug
- Oscillator
- Oscilloscope
- Noise Meter

NOTE:
Before starting the test, make the following settings.
1. Set the INPUT LEVEL's knobs(PIEZO and MAGNETIC) to the center.
2. Set ALL POLARITY SWs of two FS-SUs to the direction to the jack.
3. Connect the remote jack and two FS-SUs by using the PCS-31.

To Enter the Test Mode
At first, set all knobs except the INPUT LEVEL's one to the minimum. While pressing the EFFECTS BYPASS key, turn the power on, so the POWER LED will be turned on.

To Exit the Test Mode
Simply turn off the power.

1. LED Check
If you set the FREQ knob to the maximum, the test program will start and turn on all LEDs by one in the order shown in Fig. 1. Verify each LED light correctly. Set the FREQ knob to the minimum to proceed to the next step. Press the EFFECTS BYPASS key to proceed to the next step.

2. EFFECTS BYPASS key and Remote Jack Check
Press the EFFECTS BYPASS key and verify that the EFFECTS BYPASS LED is turned on. Verify that the CHORUS LED or the REVERB LED is turned on by pressing the each FS-SU. If you turn the LEVEL knob to the other direction except the minimum, the test proceed to the next step.

3. VR Check(except INPUT LEVEL)
Check the VRs one by one in the order shown in Fig. 2. If you turn the VR from the minimum to the maximum clockwise, and counterclockwise, you can verify the several lighting pattern of the LEDs(chorus, reverber, EFFECTS BYPASS) according to the VR direction. Shown in Table 1. If you haven’t finished to turn the VR to be tested exactly and turn the other one, the PEAK LED will blink. If all VR tests are finished, the EFFECTS BYPASS LED will be turned on. Press the EFFECTS BYPASS key to proceed to the next step.

3. ポリュームチェック（INPUT LEVEL列を除く）

2段階のボリュームのチェックを行います。ボリュームは、最小から最大を順に回して、表のようポリュームの順に並べてLED（CHORUS, REVERB, EFFECTS BYPASS）による5つセンターよりが確認できます。もし、テストするボリュームを正しく出さずに変わるボリュームが出されば、PEAK LEDが点滅します。全てのボリュームがテストされると、EFFECTS BYPASS LEDが点灯します。EFFECTS BYPASSを押すと、次のステップへ進みます。

4. DSP Check
The test program writes the test data into the DSP and reads it from the DSP. If the test program fail to write or read, the each LEDs(chorus, reverb) are turned on or off according to the content of the error. Shown in Table 2. Otherwise, it proceed to the next step automatically.

4. DSPチェック
DSPへのテストデータの書き込みおよび読み出しを行います。書き込みおよび読み出しが失敗した場合、表のようそのメッセージの内容によってそれぞれのLED（CHORUS, REVERB）が点滅または消灯します。残りは、次ステップへ自動的に進みます。
5. Output Frequency Response Check
NOTE: Check the Lch(Mono)/Rch jacks and the Lch/Rch cannons (HOT-GND,COLD-GND). If the Lch or the OUTPUT jack is used alone, or the BALANCED OUTPUT SW is set to MONO, the Ch and the Rch signals are mixed internally, but no signals are outputted because their phase are opposite each other. So, when checking the Lch of the OUTPUT jack, be sure to insert the opened plug into the Rch, and when checking the Lch of the OUTPUT jack, be sure to set the BALANCED OUTPUT SW to STEREO to obtain the correct waveform.

Set the noise meter to FLAT. The frequency being output will be changed depending on the LED lighting pattern shown in Table 3. Verify the meter readings are ±20dBm ±1.5dB.
The difference between the Lch and the Rch should be within ±2dB.
Press the EFFECTS BYPASS key to proceed to the next step.
To return back to the step 3, press the FS-US being connected to the CHORUS REMOTE.

<table>
<thead>
<tr>
<th>CHORUS LED</th>
<th>NEVEN LED</th>
<th>Frequency</th>
<th>dBm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lch</td>
<td>Rch</td>
<td>20kHz</td>
<td>±20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20kHz</td>
<td>±1.5</td>
</tr>
</tbody>
</table>

Table 3 / 8-3

6. Output Mute Check
NOTE: Check the Lch(Mono)/Rch jacks and the Lch/Rch cannons (HOT-GND,COLD-GND). If the FS-US is used alone, or the BALANCED OUTPUT SW is set to MONO, the Lch and the Rch signals are mixed internally, but no signals are outputted because their phase are opposite each other. So, when checking the Lch of the OUTPUT jack, be sure to insert the opened plug into the Rch, and when checking the Lch of the OUTPUT jack, be sure to set the BALANCED OUTPUT SW to STEREO to obtain the correct waveform.

The muling on and off should correspond to the blinking of the CHORUS LED. Verify the waveform being output. Press EFFECTS BYPASS key to proceed to the next step.
To return back to the step 5, press the FS-US being connected to the CHORUS REMOTE:

CHORUS LED

CHORUS LED

7-1a. Residual Noise and Shock Noise Check (DSP thru)
NOTE: Check the Lch(Mono)/Rch jacks and the Lch/Rch cannons (HOT-GND,COLD-GND). If the Lch of the OUTPUT jack is used alone, or the BALANCED OUTPUT SW is set to MONO, the Lch and the Rch signals are mixed internally, and the correct waveform would not be output. So, when checking the Lch of the OUTPUT jack, be sure to insert the opened plug into the Rch, and when checking the OUTPUT cannon of the Lch, be sure to set the BALANCED OUTPUT SW to STEREO to obtain the correct waveform.

First of all, check the the PHASE SW is set to the NOR, and set the INPUT LEVEL VRs (PIEZO, MAGNETIC) to the minimum.
Input a 200Hz, 20Wpm square wave to the INPUT jack (both of PIEZO and MAGNETIC) by using J. Verify the changing of the output waveform corresponding to the direction of the VR when the other is set to the minimum.
Check the output waveform when the VR is set to

7-1b. AF-AD Check
NOTE: Check the Lch(Mono)/Rch jacks and the Lch/Rch cannons (HOT-GND,COLD-GND). If the Lch of the OUTPUT jack is used alone, the Lch and the Rch signals are mixed internally, and the correct waveform would not be output. So, when checking the Lch of the OUTPUT jack, be sure to insert the opened plug into the Rch, and when checking the OUTPUT cannon of the Lch, be sure to set the BALANCED OUTPUT SW to STEREO to obtain the correct waveform.

First of all, check the the PHASE SW is set to the NOR, and set the INPUT LEVEL VRs (PIEZO, MAGNETIC) to the minimum.
Input a 200Hz, 20Wpm square wave to the INPUT jack (both of PIEZO and MAGNETIC) by using J. Verify the changing of the output waveform corresponding to the direction of the VR when the other is set to the minimum.
Check the output waveform when the VR is set to

7-1c. Residual Noise and Shock Noise Check (DSP thru)
NOTE: Check the Lch(Mono)/Rch jacks and the Lch/Rch cannons (HOT-GND,COLD-GND). If the Lch of the OUTPUT jack is used alone, or the BALANCED OUTPUT SW is set to MONO, the Lch and the Rch signals are mixed internally, and the correct waveform would not be output. So, when checking the Lch of the OUTPUT jack, be sure to insert the opened plug into the Rch, and when checking the OUTPUT cannon of the Lch, be sure to set the BALANCED OUTPUT SW to STEREO to obtain the correct waveform.

First of all, check the the PHASE SW is set to the NOR, and set the INPUT LEVEL VRs (PIEZO, MAGNETIC) to the minimum.
Input a 200Hz, 20Wpm square wave to the INPUT jack (both of PIEZO and MAGNETIC) by using J. Verify the changing of the output waveform corresponding to the direction of the VR when the other is set to the minimum.
Check the output waveform when the VR is set to

7-2 INPUT LEVEL VR and Total Frequency Response Check (DSP thru)
NOTE: Check the Lch(Mono)/Rch jacks and the Lch/Rch cannons (HOT-GND,COLD-GND). If the Lch of the OUTPUT jack is used alone, or the BALANCED OUTPUT SW is set to MONO, the Lch and the Rch signals are mixed internally, and the correct waveform would not be output. So, when checking the Lch of the OUTPUT jack, be sure to insert the opened plug into the Rch, and when checking the OUTPUT cannon of the Lch, be sure to set the BALANCED OUTPUT SW to STEREO to obtain the correct waveform.

First of all, check the the PHASE SW is set to the NOR, and set the INPUT LEVEL VRs (PIEZO, MAGNETIC) to the minimum.
Input a 200Hz, 20Wpm square wave to the INPUT jack (both of PIEZO and MAGNETIC) by using J. Verify the changing of the output waveform corresponding to the direction of the VR when the other is set to the minimum.
Check the output waveform when the VR is set to

7-2 INPUT LEVEL VR and Total Frequency Response Check (DSP thru)
NOTE: Check the Lch(Mono)/Rch jacks and the Lch/Rch cannons (HOT-GND,COLD-GND). If the Lch of the OUTPUT jack is used alone, or the BALANCED OUTPUT SW is set to MONO, the Lch and the Rch signals are mixed internally, and the correct waveform would not be output. So, when checking the Lch of the OUTPUT jack, be sure to insert the opened plug into the Rch, and when checking the OUTPUT cannon of the Lch, be sure to set the BALANCED OUTPUT SW to STEREO to obtain the correct waveform.

First of all, check the the PHASE SW is set to the NOR, and set the INPUT LEVEL VRs (PIEZO, MAGNETIC) to the minimum.
Input a 200Hz, 20Wpm square wave to the INPUT jack (both of PIEZO and MAGNETIC) by using J. Verify the changing of the output waveform corresponding to the direction of the VR when the other is set to the minimum.
Check the output waveform when the VR is set to

7-2 INPUT LEVEL VR and Total Frequency Response Check (DSP thru)
NOTE: Check the Lch(Mono)/Rch jacks and the Lch/Rch cannons (HOT-GND,COLD-GND). If the Lch of the OUTPUT jack is used alone, or the BALANCED OUTPUT SW is set to MONO, the Lch and the Rch signals are mixed internally, and the correct waveform would not be output. So, when checking the Lch of the OUTPUT jack, be sure to insert the opened plug into the Rch, and when checking the OUTPUT cannon of the Lch, be sure to set the BALANCED OUTPUT SW to STEREO to obtain the correct waveform.

First of all, check the the PHASE SW is set to the NOR, and set the INPUT LEVEL VRs (PIEZO, MAGNETIC) to the minimum.
Input a 200Hz, 20Wpm square wave to the INPUT jack (both of PIEZO and MAGNETIC) by using J. Verify the changing of the output waveform corresponding to the direction of the VR when the other is set to the minimum.
Check the output waveform when the VR is set to

7-2 INPUT LEVEL VR and Total Frequency Response Check (DSP thru)
NOTE: Check the Lch(Mono)/Rch jacks and the Lch/Rch cannons (HOT-GND,COLD-GND). If the Lch of the OUTPUT jack is used alone, or the BALANCED OUTPUT SW is set to MONO, the Lch and the Rch signals are mixed internally, and the correct waveform would not be output. So, when checking the Lch of the OUTPUT jack, be sure to insert the opened plug into the Rch, and when checking the OUTPUT cannon of the Lch, be sure to set the BALANCED OUTPUT SW to STEREO to obtain the correct waveform.

First of all, check the the PHASE SW is set to the NOR, and set the INPUT LEVEL VRs (PIEZO, MAGNETIC) to the minimum.
Input a 200Hz, 20Wpm square wave to the INPUT jack (both of PIEZO and MAGNETIC) by using J. Verify the changing of the output waveform corresponding to the direction of the VR when the other is set to the minimum.
Check the output waveform when the VR is set to

7-2 INPUT LEVEL VR and Total Frequency Response Check (DSP thru)
NOTE: Check the Lch(Mono)/Rch jacks and the Lch/Rch cannons (HOT-GND,COLD-GND). If the Lch of the OUTPUT jack is used alone, or the BALANCED OUTPUT SW is set to MONO, the Lch and the Rch signals are mixed internally, and the correct waveform would not be output. So, when checking the Lch of the OUTPUT jack, be sure to insert the opened plug into the Rch, and when checking the OUTPUT cannon of the Lch, be sure to set the BALANCED OUTPUT SW to STEREO to obtain the correct waveform.

First of all, check the the PHASE SW is set to the NOR, and set the INPUT LEVEL VRs (PIEZO, MAGNETIC) to the minimum.
Input a 200Hz, 20Wpm square wave to the INPUT jack (both of PIEZO and MAGNETIC) by using J. Verify the changing of the output waveform corresponding to the direction of the VR when the other is set to the minimum.
Check the output waveform when the VR is set to
minimum and the other one is set to the center. The
waveforms and the levels of the PIEZO and the
MAGNETIC will be the same.
To return back to the step 6, press the FS-SU being
connected to the CHORUS REMOTE.

7-4. PEAK LED Check
NOTE: Check the Lch(MONO)/Rch jacks. If the Lch
of the OUTPUT jack is used alone, the Lch and
the Rch signals are mixed internally, and
the correct waveform would not be
out. So, when checking the Lch of the
OUTPUT jack, be sure to insert the opened
gap into the Rch to obtain the correct
waveform.
Set the INPUT LEVEL VR's (both of PIEZO and
MAGNETIC) to the minimum. Input a 1kHz,
3.5dBm (50mV) sine wave to the INPUT jack(either
PIEZO or MAGNETIC). If you turn the INPUT
LEVEL VR being inputted signals to around the
center slowly, PEAK LED will be turned on At that
time, verify the signals are not distorted.
To return back to the step 6, press the FS-SU being
connected to the CHORUS REMOTE.

7-3. Phase SW Check
NOTE: 1. Check the Lch(MONO)/Rch jacks. If the Lch
of the OUTPUT jack is used alone, the Lch and
the Rch signals are mixed internally, and the correct waveform would not be
output. So, when checking the Lch of the
OUTPUT jack, be sure to insert the opened
gap into the Rch to obtain the correct
waveform.
Set the PHASE SW to the INV and input a 200kHz,
200mVp-p square wave to the INPUT jack(both of
PIEZO and MAGNETIC) by using J-5. When the
INPUT LEVEL VR's (both of PIEZO and MAGNETIC)
are set to around the center, the Output waveforms
will disappear. Set the PHASE SW to the NOR, and
check the Lch(MONO)/Rch jacks. If the
OUTPUT jack is used alone, the correct
waveform would not be
out. So, when checking the OUTPUT jack of the
Lch, be sure to insert the opened
gap into the Rch to obtain the correct
waveform.

7-5. INSERT Jack Check
NOTE: Check the Lch(MONO)/Rch jacks. If the Lch
of the OUTPUT jack is used alone, the Lch and
the Rch signals are mixed internally, and
correct waveform would not be
out. So, when checking the OUTPUT jack of the
Lch, be sure to insert the opened
gap into the Rch to obtain the correct
waveform.
Connect the stereo plug of the PCS-31 to the
INSERT jack. Set the INPUT LEVEL VR's (both of
PIEZO and MAGNETIC) to the center. Input a
200kHz, 200mVp-p square wave to the
INPUT jack(either PIEZO or MAGNETIC). Verify the signal
being output from the mono plug of the PCS-31
corresponding to the SEND of the INSERT jack. Then,
input the same square wave to the RETURN of the
INSERT jack. Verify the waveform being output
from the OUTPUT jack. To return back to the step 6, press the FS-SU being
connected to the CHORUS REMOTE.
ERROR MESSAGES ／エラー・メッセージとその内容

If an error messages is displayed in TEST MODE, take the necessary to remove the cause described below.

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Possible cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSP busy Error</td>
<td>• Solder bridge or improper soldering at portion anywhere between CPU(C10) and DSP(C12), CPU(C10) and/or DSP(C12) defective.</td>
</tr>
<tr>
<td>DSP RAM Error</td>
<td>• Solder bridge or improper soldering around DSP(C12). DSP(C12) defective.</td>
</tr>
<tr>
<td>DSP IRAM Error</td>
<td>• Solder bridge or improper soldering around DSP(C12). DSP(C12) defective.</td>
</tr>
<tr>
<td>DSP ERAM Error</td>
<td>• Solder bridge or improper soldering at portion anywhere between DSP(C12) and DRAM(C13). DSP(C12) or DRAM(C13) defective.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Main cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSP busy Error</td>
<td>• CPU(C10) and DSP(C12) 間の半田タッチ。半田付け不良。</td>
</tr>
<tr>
<td>DSP ERAM Error</td>
<td>• CPU(C10) または DSP(C12) の不良。</td>
</tr>
<tr>
<td>DSP RAM Error</td>
<td>• DSP(C12) 周辺の半田タッチ。半田付け不良。</td>
</tr>
<tr>
<td>DSP IRAM Error</td>
<td>• DSP(C12) 周辺の半田タッチ。半田付け不良。</td>
</tr>
</tbody>
</table>

IDENTIFYING VERSION NUMBER ／バージョンの確認方法

1. Turn the power off.
2. Set all the knobs to the minimum. While pressing the EFFECTS BYPASS key, turn the power on. Next, turn the BODY knob to the maximum, so the version number is represented by some LEDs as shown below. The EFFECTS BYPASS LED, THE CHORUS LED and the REVERB LED each show digits, the number of flashing the PEAK LED shows the figure.

Example: For Ver. 1.00

1. EFFECT BYPASS LED is turned on. The PEAK LED is turned on and off once.
2. CHORUS LED is turned on. The PEAK LED is turned on and off once.
3. REVERB LED is turned on. The PEAK LED isn't turned on.

Example: Ver. 1.00

• EFFECT BYPASS LED is turned on.
• PEAK LED is turned on and off once.
• CHORUS LED is turned on.
• REVERB LED is turned on.

3. Turn the power off to exit this mode.
MAIN BOARD ASS’Y

View from component side

View from solder side
PWB／基板図

VR BOARD ASS'Y
IN JK BOARD ASS'Y
OUT JK BOARD ASS'Y