E-X20
E-X20A
ARRANGER KEYBOARD

SERVICE NOTES
Issued by RJA

Table of Contents

E-X20

E-X20A

Revise Information

Mar. 29, 2019	p. 4, p. 7	Added a model.
Feb. 9, 2021	p. 9	Added a section.
Mar. 4, 2022	p. 4, p. 7	Added a part.

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Cautionary Notes

Before beginning the procedure, please read through this document. The matters described may differ according to the model.

User Data Cannot Be Backed Up

This product cannot back up user data to external media. And user data cannot be written on paper.

Parts List

A component whose part code is ******** will not be supplied as a service part because one of the following reasons applies.

- Because it is supplied as an assembled part (under a different part code).
- Because a number of circuit boards are grouped together and supplied as a single circuit board (under a different part code).
- Because supply is prohibited due to copyright restrictions.
- Because reissuance is restricted.
- Because the part is made to order (at current market price).
- Because it is carried in electronic data on the Roland web site.
- Because it is a package or an accessory irrelevant to the function maintenance of the main body.
- Because it can be replaced with an article on the market. (battery or etc.)

Specifications of E-X20

Roland E-X20: Arranger Keyboard

Keyboard

61 keys (with velocity)

Sound Generator

Maximum Polyphony

128 voices

Parts

16 parts

Wave Memory

64 MB

Tones

Tones: 391 + 256 (GM2)
Drum Sets: 9 (GM2)

Effects

Reverb: 10 types
Chorus: 8 types

Transpose

-12–+12 (in semitones)

Octave

-1–+1

Arranger

Tempo

30–280

Styles

253 styles

One Touch Setting

4 settings/styles

Controls

START/STOP, SYNC START, INTRO/ENDING, FILL A, FILL B, FADE, CHORD

Metronome

Beat

0, 2–9

Song

Internal Songs

140 songs

Recording

10 songs

Others

Rated Power Output

3 W + 3 W

Speakers

10 cm x 2

Controllers

Pitch bend wheel

Display

Custom LCD

Connectors

PHONES jack: Stereo 1/4-inch phone type
OUTPUT (L/MONO, R) jacks: 1/4-inch phone type
SUSTAIN jack: 1/4-inch TRS phone type
USB Computer port: USB B type
DC IN jack

Power Supply

AC adaptor

Current Draw

1 A

Dimensions

956 (W) x 360 (D) x 133 (H) mm
37-11/16 (W) x 14-3/16 (D) x 5-1/4 (H) inches

Weight (excluding AC adaptor)

5.0 kg
11 lbs 1 oz

Accessories

Owner's Manual (#17042140: English, #17042141: Chinese)
Leaflet "USING THE UNIT SAFELY" (#*******)
AC adaptor (#17042142, #17042143, #17042144, #17042145, #17042146)
Music rest (#17042139)

Options (sold separately)

Pedal switch: DP series

Specification of E-X20A

Roland E-X20A: Arranger Keyboard

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61 keys (with velocity)

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Drum sets: 2 + 9 (GM2)

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Transpose

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Octave

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Arranger

Tempo

30–280

Styles

289 styles

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Accessories

Owner's Manual (#17042208: English, #17042209: Chinese)
Leaflet "USING THE UNIT SAFELY" (#*******)
AC adaptor (#17042341, #17042142, #17042143, #17042144, #17042145, #17042146)
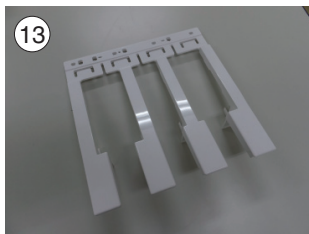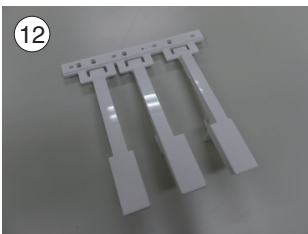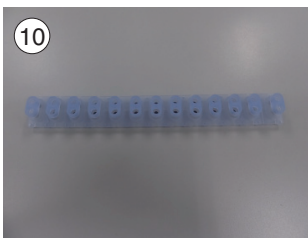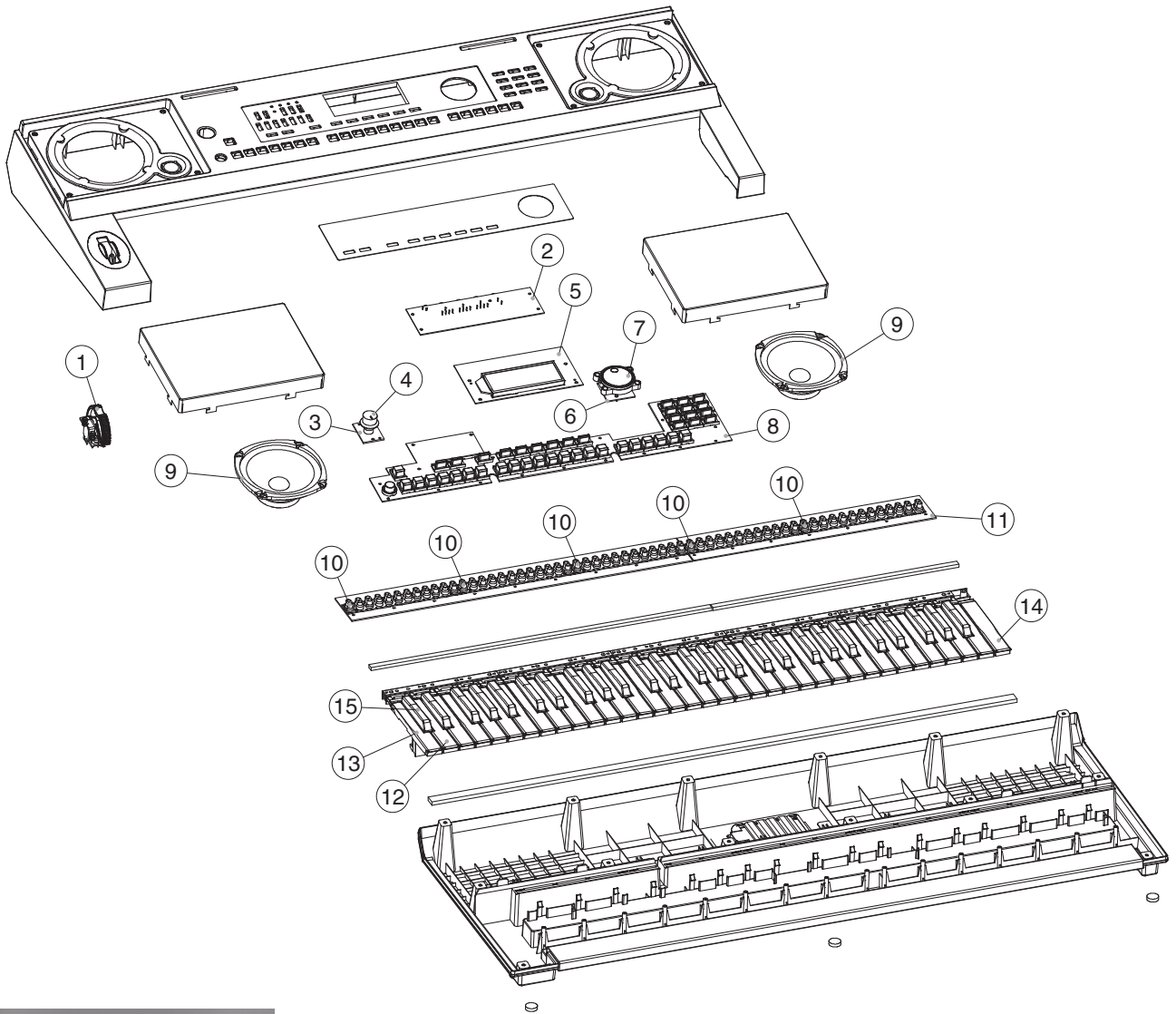Music rest (#17042139)

Options (sold separately)

Pedal switch: DP series

* Printed matters will not be supplied after the end of the production. Then, download the electronic file from the Roland web site.

* In the interest of product improvement, the specifications and/or appearance of this unit are subject to change without prior notice.

Exploded View

Exploded View Parts List

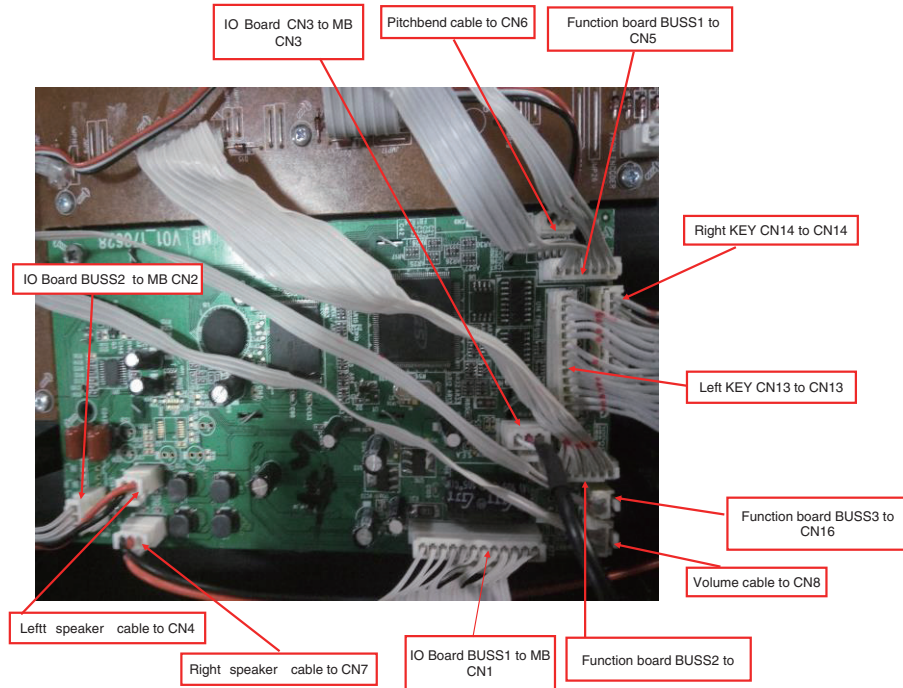| No.	Part Code	Part Name	Description		Q'ty
1	17042123	ROTATE WHEEL ASSY			1
2	17042124	JACK BOARD ASSY			1
3	17042125	VOLUME BOARD ASSY			1
4	17042126	VOLUME KNOB			1
5	17042127	MAIN BOARD ASSY		for E-X20	1
	17042207	MAIN BOARD ASSY		for E-X20A	1
6	17042128	ENCODER BOARD ASSY			1
7	17042129	ENCODER KNOB			1
8	17042130	FUNCTION BOARD ASSY			1
9	17042131	SPEAKER			2
10	17042132	RUBBER SWITCH 13P			5
11	17042133	KEYSCAN BOARD	H+L WO/RUBBER SW		1
12	17042134	NATURAL KEY	3-KEY GROUP		5
13	17042135	NATURAL KEY	4-KEY GROUP		5
14	17042136	NATURAL KEY	SINGLE		1
15	17042137	SHARP KEY			5
16	17042138	BATTERY COVER			1

* *When replacing No.10 RUBBER SWITCH 13P for other than the highest position (right end) of the keyboard, cut 1P to change 13P to 12P.*

* *When parts except above are necessary for repair, replace the product itself with a new one.*

Accessories Parts List

Part Code	Part Name	Description		Q'ty
17042139	MUSIC REST			1
17042140	OWNER'S MANUAL	ENGLISH	for E-X20	1
17042208	OWNER'S MANUAL	ENGLISH	for E-X20A	1
17042141	OWNER'S MANUAL	CHINESE	for E-X20	1
17042209	OWNER'S MANUAL	CHINESE	for E-X20A	1
17042341	AC ADAPTOR	MU12AR120100-D1	(26) for 117VBL	1
17042142	AC ADAPTOR	MU12AR120100-A1	(28) for 117VU/CS	1
17042143	AC ADAPTOR	MU12AR120100-C5	(32) for 230VEU	1
17042144	AC ADAPTOR	MU12AR120100-B3	(36) for 230VIN	1
17042145	AC ADAPTOR	MU12AR120100-B2	(49) for 230VE	1
17042146	AC ADAPTOR	MU12AR120100-A2	(65) for 220VCN	1

Connecting Wirings

IO Board CN3 to MB CN3

Pitchbend cable to CN6

Function board BUSS1 to CN5

Right KEY CN14 to CN14

IO Board BUSS2 to MB CN2

Left KEY CN13 to CN13

Function board BUSS3 to CN16

Volume cable to CN8

Leftt speaker cable to CN4

Right speaker cable to CN7

IO Board BUSS1 to MB CN1

Function board BUSS2 to

Main board to other board connection	
Main board	other board
CN5	Function board BUSS1
CN12	Function board BUSS2
CN6	Pitchbend
CN8	Volume board BUSS4
CN2	IO board BUSS2
CN13	Left keyboard
CN14	Right keyboard
CN4	Left speaker
CN7	Right speaker
CN1	IO board BUSS1
CN3	IO board BUSS3

MB CN16 to BUSS3

MB CN12 to BUSS2

MB CN5 to BUSS1

Encoder cable to CN3
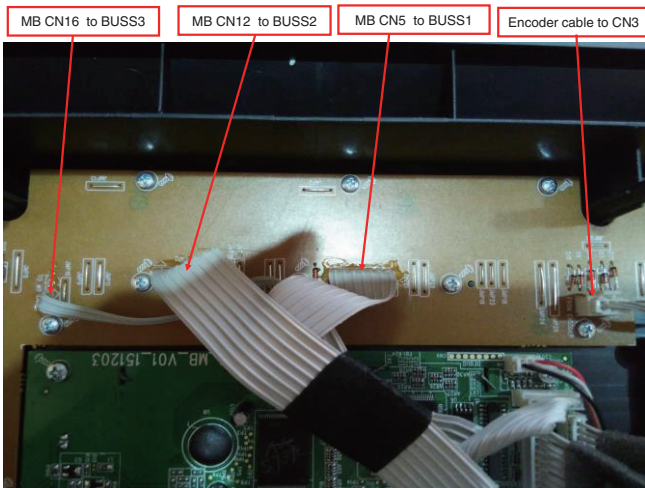
Function board to other board connection	
Function board	other board
BUSS1	MB CN5
CN3	Encoder
BUSS2	MB CN12
BUSS3	MB CN16

Battery cable to

MB CN2 to BUSS2

MB CN1 to BUSS1

MB CN3 to CN3
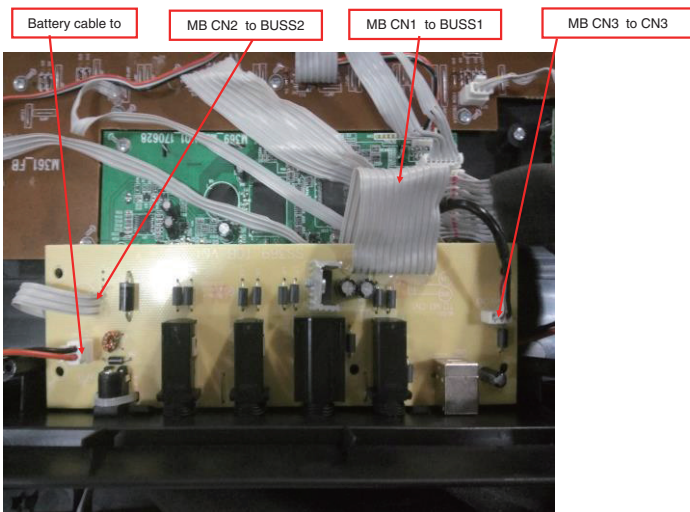
IO board to other connection	
IO board	other
CN4	Battery
BUSS1	MB CN1
BUSS2	MB CN2
CN3	MB CN3

Factory Reset

Hold down [+/YES] and [-/NO], and turn on the power.

System Self-test

Key Combination Instruction

Press and hold the following key combination then power on can achieve some special functions:

- Press [STORE] + [M1] + [M3], to enter firmware update mode.
- Press [STORE] + [M2] + [M4], to enter system self-test mode.
- Press [STORE] + [M3] + [M4], to display the serial number.
- Press [+/YES] + [-/NO], to reset all user data (except lesson course).
- Press [STORE] + [M1], to clean the memory data.

Operating Instructions

System self-test function could assist you make a comprehensive check with these functions: LCD, DAC, ADC, USB-MIDI port, function buttons, keys, pedals, A2S-RAM and A2S-ROM.

Before power on, please follow the procedure below:

- Connect the piano to PC via USB cable.
- Connect the pedals.

You can press the following button combination to choose a test item:

- Press and hold [PLAY/STOP] button then press [+] button to enter into the next test item.
- Press and hold [PLAY/STOP] button then press [-] button to return to the previous test item.

* *After entering into the System self-test mode, please turn the [VOLUME] knob to the Maximum level.*

Test 1: Display the Firmware Version Number

In Test 1, the LCD will display the firmware version number, as the following picture when the version number is V1.0.0.
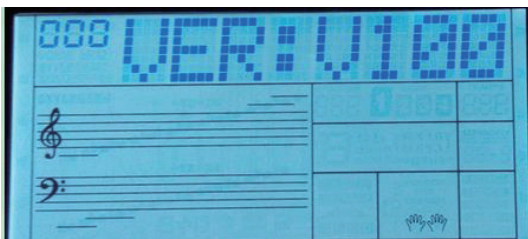
In this mode, you can press and hold [START/STOP] button then press [+] button to enter into the Test 2.

Test 2: LCD Inspection

When switch to the Test 2, the LCD will display: LCD TEST

Press [+] button can start the LCD inspection, and the LCD will display the test image (Full screen light).
After starting the LCD inspection, you can press [+] or [-] button to change the test image (as following pictures), and check the LCD whether was OK (such as ghost shadow and bad point problems).

The Test image:
1. Full screen light
2. Full screen dark
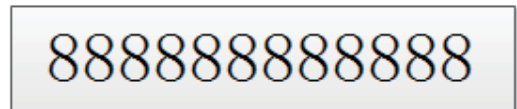
3. display in the LCD lattice area ">"

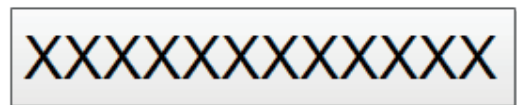4. display in the LCD lattice area "<"

5. display in the LCD lattice area "#"

6. display in the LCD lattice area "8"

7. display in the LCD lattice area "x"

In this mode, you can press and hold [START/STOP] button then press [+] button to enter into the Test 3.
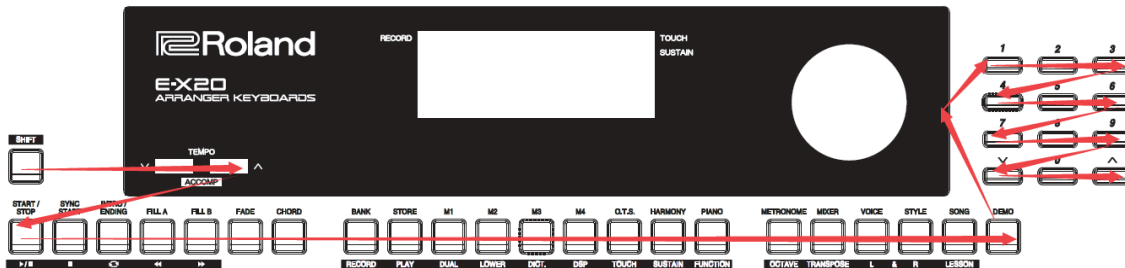
Test 3: Function Buttons Inspection

When switch to the Test 3, the LCD will display: SHIFT

Press the [+] button can start the buttons inspection.
In the process of buttons inspection, the LCD will indicate the next button number that need to check.

Please check the buttons strictly in the order from left to right, as the following figure:

When the current button check is passed, the piano would sound the prompt tone "Clave". Otherwise, the piano would sound the prompt tone "Cymbal".
When all of the button checks are passed, the LCD will display: PASS
At this time, you should rotate the dial anticlockwise until the number exceeding 10, and then rotate it clockwise to return to 0, which indicate this test is passed.

When all of the function buttons and the dial checking are passed, the LCD will display: PASS
At this time, you can press and hold [START/STOP] button then press [+] button to enter into Test 4.

* *If the current function button check is failed, the test would stop at the current position until the current error to be solved.*

Test 4: Keys Inspection

When switch to the Test 4, the LCD will display: K61-C7
* *K61 is the key number (the last key), C7 is the key name.*
Press the [+] button can start the keys inspection.

In the process of keys inspection, the LCD will indicate the next key which you need to check. For example: K60-B6, it means you should check the second key (From right to left): B6.

You should check the keys strictly in the order from right to left with medium velocity(40–90). If the key number and the velocity level that you pressed are right, the piano would sound the prompt tone "Clave" and the PC will receive a midi data (NOTE ON event) from the piano. If the key number is right but the velocity level is wrong, the piano would sound the prompt tone "Metronome2". If the key number is wrong, the piano would sound the prompt tone "Cymbal".
The keys inspection order as the following figure:
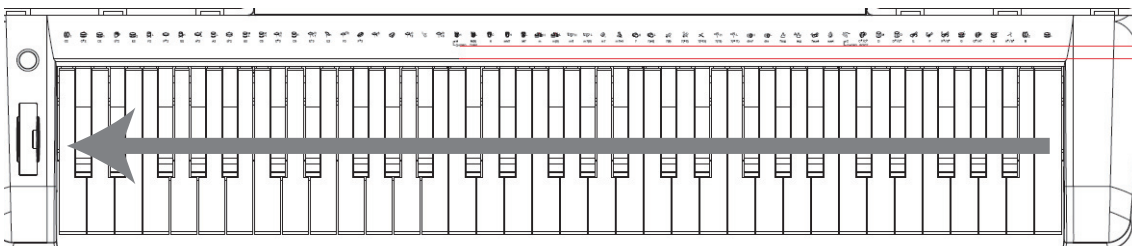
When all of the key checks are passed, the LCD will display "PASS".
At this time, you can press and hold [START/STOP] button then press [+] button to enter into Test 5.

* *If the current key check is failed, the test would stop at the current position until the current error to be solved.*

* *Once starting the key inspection (after pressing the key: C8), you must finish this test item before you switch to other test item.*

* *If you can choose the USB Audio Device in a PC MIDI software (e.g. MIDI-OX), and could also receive MIDI data from the piano, it means the USB jack is working. Also, you can judge whether the velocity level are in normal range by checking the received MIDI notes.*

Test 5: Pedals Inspection

When switch to the Test 5, The LCD will display: Ped Test

When the pedals checks are passed, the LCD will display "PASS".
At this time, you can press and hold [START/STOP] button then press [+] button to enter into Test 6.

Test 6: ADC Inspection

When switch to the Test 6, the LCD will display: Adc Test L

Press the [+] button, and then rotate the master volume knob can start the ADC inspection, and you should rotating it left and right (need to reach the MIN and MAX), and the LCD will display the ADC value real-time.
For example, if the brilliance knob rotates to the middle position, the LCD will display the ADC value: 127

When the master volume knob was rotated to MIN and MAX (ADC value is 000 and 127), the LCD will display: ADC-PIT

When the pitch-bend was up to MIN and MAX (ADC value is 000 and 127), the LCD will display: PASS

At this time, you can press and hold [START/STOP] button then press [+] button to enter into Test 7.

* *If the current ADC check is failed, then the test will stop at the current position until the current error to be solved.*

* *Once starting the ADC inspection (when has rotated the knob), you should finish this test before you switch to other test items.*

Test 7: Audio Test Signal Inspection

When switch to the Test 7, the LCD will display:

You can press the specific key ([C4]–[C#5]), to select output specific audio test signal, and the LCD will indicate current audio test signal. For example:

All the audio test signals are shown as the following table:

No.	Key position	Audio test signal	LCD display
1	C4	Left phase (1 kHz sine wave)	PAN_L
2	C#4	Right phase(1 kHz sine wave)	PAN_R
3	D4	Max undistorted signal (L: 1 kHz sine wave, R: 440 Hz sine wave)	ALOSSLESS
4	D#4	1 kHz sine wave	SIN1KHz
5	E4	Church Organ	CH_ORGAN
6	F4	Sweep signal 1 (range: 20 Hz–320 Hz)	SW_FRE_1
7	F#4	Sweep signal 2 (range: 320 Hz–4800 Hz)	SW_FRE_2
8	G4	White noise	WHINOISE
9	G#4	100 Hz sine wave	SIN100Hz
10	A4	300 Hz sine wave	SIN300Hz
11	A#4	440 Hz sine wave	SIN440Hz
12	B4	10 kHz sine wave	SIN10KHz
13	C5	AP test signal (IMD)	AP_IMD
14	C#5	AP test signal (MultiTone)	AP_MULTI

When you press other keys, such as [C3], it will stop output the audio test signal, the LCD will display: AU:OFF. At this time, you can check the static noise level of the piano.
When the piano output the maximum undistorted signal, rotate the volume knob left or right, you can check that the volume knob whether is OK.
In Test 7 mode, you can press and hold [START/STOP] button then press [+] button to enter into Test 8.

Test 8: Data Interface and Memory Inspection

When switch to the Test 8, the LCD will temporary display: BACK:RUN. It means the background inspection was running. And then, the LCD will show the test results.
If there is any item failed during the inspection, the LCD will display the failed item, and the piano would sound a prompt tone "Cymbal".
For example, if the second item is failed, the LCD will display: ROM

If no item is failed, the LCD will display: PASS, and the piano would sound a prompt tone "Clave". Test 8 inspection items are shown as following table.

NO.	content	LCD display
1	A2S-RAM	RAM
2	A2S-ROM	ROM

* *All the inspection items of Test 8 are processed in the background and the examination completes automatically, and it is started when the system power on. So, if you want to recheck it, you should restart the digital piano and enter into the system self-test again.*
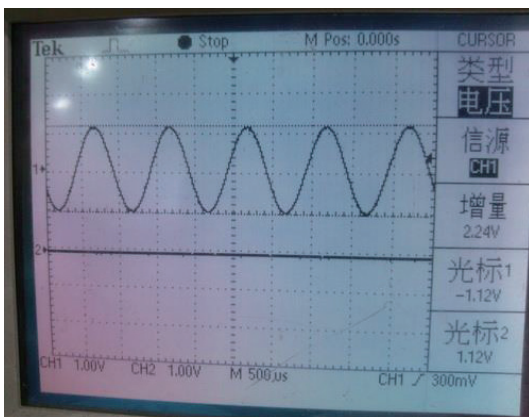
Appendix: Audio Test Signal

1. Left phase:

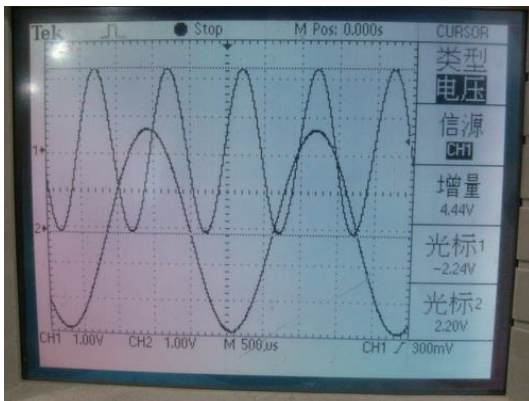Left channel output a 1 kHz sine wave, right channel has no output.
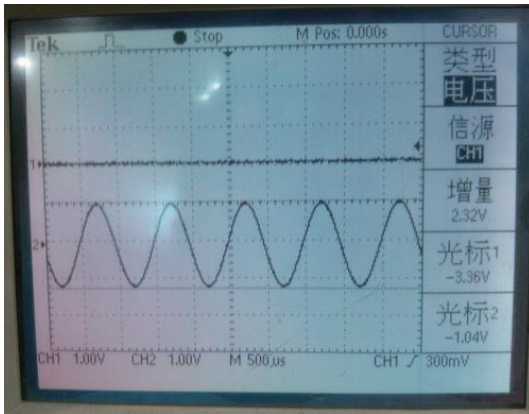
2. Right phase:

Right channel output a 1 kHz sine wave, left channel has no output.

3. Maximum undistorted signal:

Left channel output a 1 kHz sine wave, right channel output a 440 Hz sine wave.

4. 1 kHz sine

Left channel output a 1 kHz sine wave, right channel output a 1KHz sine wave.

5. Tone test signal

Output a standard Church Organ.

6. Sweep frequency signal 1:

Output scan signal with frequency range: 20 Hz–320 Hz

7. Sweep frequency signal 2.

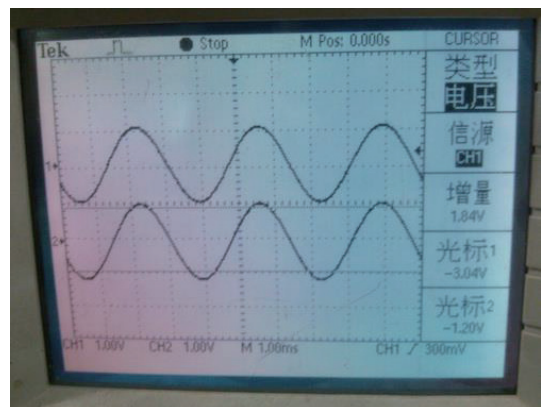Output scan signal with frequency range: 320 Hz–4800 Hz
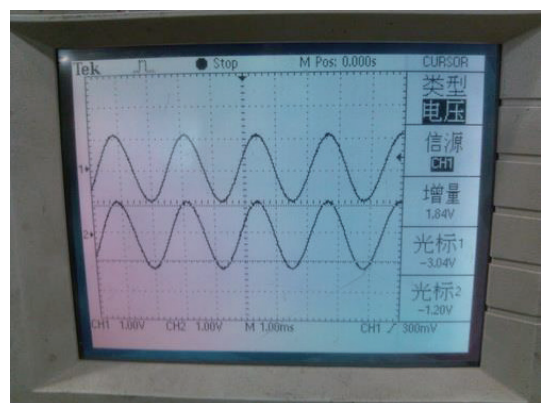
8. White noise

Output a white noise signal.
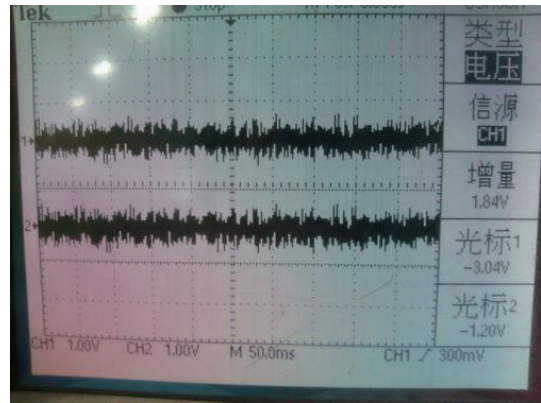
9. 100 Hz sine wave
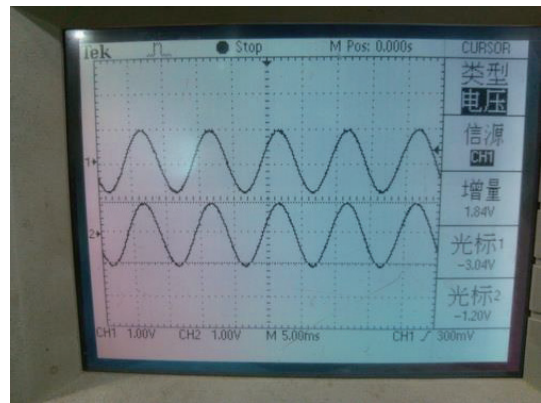
10. 300 Hz sine wave

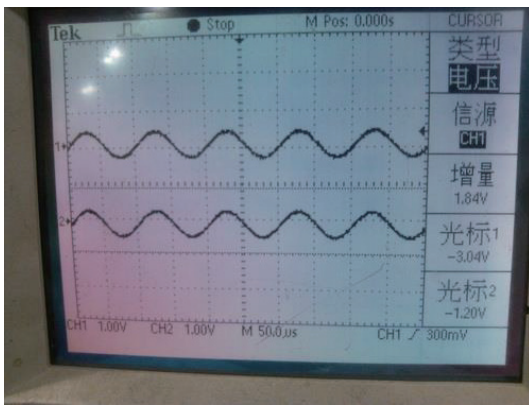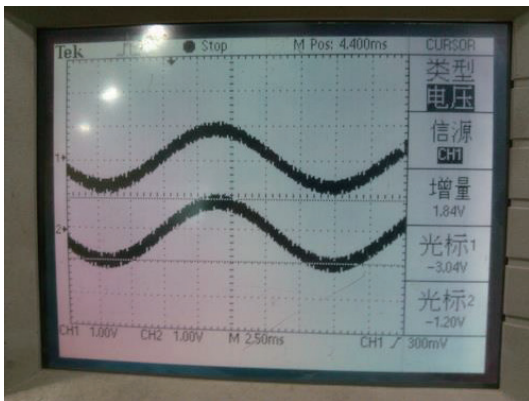**11. 440 Hz sine wave**

12. 10 kHz sine wave

13. AP test signal (IMD)

14. AP test signal (MultiTone)