

nord c1

C O M B O O R G A N



SERVICE MANUAL

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The Nord C1 Combo Organ Service manual is arranged to help our service centers in the best way possible. However the Nord C1 Combo Organ user manual is a very useful guide, use it as a reference in addition to this service manual. If you have access to internet you'll find the user manual available for download and also a lot of useful information on our website www.clavia.se

 The information in this service manual is intended for service centers that repair Clavia products. It may **not** be copied, reposted, modified, served from other web pages, made into derivative works or distributed to other sources such as end users or retailers that do not repair Clavia products.

 In this manual the Nord C1 Combo Organ will be referred to as **Nord C1**

Important safety information

Dangerous voltage levels are present within the unit.

- Unit should be opened exclusively by qualified service personnel.
- Always disconnect the power supply cord before opening to avoid electrical shock.
- Components and complete circuitboards may only be put into service when they are securely fixed in the instrument casing.
- Take necessary precautions against ESD before opening the unit.

Revision history

rev. 1.0 - First release

Overview

Product line

The Nord C1 Combo Organ is available
In one version.

- 2 x 61 note Keyboard version



Internal memory

The internal sound memory of Nord C1 consists of 126 program locations.
In addition there are two live buffer memories.

Fuse ratings

Voltage	115 V	230 V
Fuse	300 mA	125 mA

Physical Dimensions

Nord C1

W: 950 mm / 37,4"

D: 445 mm / 11,3"

H: 163 mm / 6,4"

Weight: 15Kg / 33 lbs

Test program

Running the test program

The Nord C1 test program is stored both in Flash and in the BootPROM position **U32**. Test program version is shown in the display when the test program is initiated.

In order to trace a hardware error easier, each Nord synthesizer has a test program. This program is primarily used in production in order to test all functions. The functions provided by the test program allow a quick and easy search for possible errors on the hardware.

⚠WARNING: Improper use of the test program or powering off the synth during a test can result in malfunction of the synth. The test program may only be used by qualified service personnel and is not intended for end users.

In order to execute the different tests on a Nord C1, press and hold buttons **[Shift + Prog]** at power up. When test mode is entered a DRAM test is performed. The DRAM test progress is indicated by the sub/sub3 and fund drawbar LED's in the lower manual section on the front panel. The LED's are divided into three groups, where each group of LED's represents a part of the DRAM test procedure. During the DRAM test the LED groups will light up, one by one. If errors are detected one of the three groups will flash.

Navigating through the test program

- Press the designated button to enter a test group.

[Prog]	[Live 1]	[Live 2]
Mainboard test	Panelboard test	System menu

- Press **[Store]** to activate and to exit test.
- Press **[Prog/menu up]** or **[Prog/menu down]** to toggle between available tests.
- Press **[Panic]** to reset a test.

Available tests are:

[prog] Main board

1.bd	Mainboard	Performs test 4,5,7									
2.Fn	Final	Only used in production									
3.Ht	Heat	Only used in production									
4.d5	DSP	Tests the two DSP's, including external memory.									
5.EP	EEPROM	Performs a quick test of the EEPROM.									
6.EP.	EEPROM Long	Tests the entire EEPROM.									
7.FL	Flash	Performs a quick test of the Flash circuits. Flash data is not altered.									
8.FL.	Flash Long	Tests the entire Flash memory area. Flash data is not altered.									
9.n i	MIDI	Tests MIDI communication. Connect a MIDI cable from MIDI in to MIDI out and then to Bass Pedal MIDI. Successful test is presented as 0 _ 0									
10.yb	Keyboard	Press one key at a time. Test counts number of keys pressed. Upper and lower switch is indicated by the dots in the display									
11.Pd	Pedal	Tests the function of the pedal inputs. To fully test the Rotor control a half moon switch must be used. <table border="1"> <tr> <td>Sustain</td><td>Rotor</td><td>Swell</td></tr> <tr> <td>P pressed</td><td>F fast</td><td>E connected</td></tr> <tr> <td>r released</td><td>5 slow</td><td></td></tr> </table>	Sustain	Rotor	Swell	P pressed	F fast	E connected	r released	5 slow	
Sustain	Rotor	Swell									
P pressed	F fast	E connected									
r released	5 slow										
12.LE	Leslie	Only used in production									
13.AU	Audio	Only used in production									

[Live 1] Panel board

1.Pn	Panelboard	Performs test 2-3
2.bt	Button	Tests the function of all the buttons
3.Ad	ADC	Tests the function of the A/D converter on the panel board. Knobs incl. swell pedal

[Live 2] System

1.5n	Serial no.	Read the serial no. by pressing [on] - [soft] - [fast] - [third] buttons in the percussion section of the panel board.
2.C5	Checksum	Only used in production
3.EF	Erase Flash	Will set all data in Flash to "1"
4.CL	Clear EEPROM	Will set all data in EEPROM to "0"

Error Codes

BootPROM ERRORS:

Nord C1 Boot Program v0.02 Error Codes

- 0 : Boot error - Flash error (unable to identify flash)
- 1 : Boot error - Flash is empty
- 2 : Boot error - Flash error (access failure)
- 3 : Boot error - Invalid OS in flash
- 4 : Boot error - Invalid test-program in flash
- 5 : Boot error - Invalid program (reserved 1) in flash
- 6 : Boot error - Invalid program (reserved 2) in flash
- 7 : Boot error - Invalid test-program in PROM
- 8 : Boot error - Invalid flash data (CAB-header is corrupt)
- 9 : Boot error - Internal error
- 10 : Transfer error - Checksum error
- 11 : Transfer error - Underrun error
- 12 : Transfer error - Overrun error
- 13 : Transfer error - Invalid memory type
- 14 : Transfer error - Invalid memory id
- 15 : Transfer error - Flash write failure
- 16 : Transfer error - Flash erase failure
- 17 : Transfer error - Flash read failure

⚠NOTE

When an error is detected within the test program it will be presented either as

“Err”

Or by the corresponding chip id flashing in the display, e.g

“U9”

Hardware

Hardware structure

The hardware structure consists of:

One power supply unit, one main board and one panel board.

Power supply

The Nord C1 is supplied with several different voltages from the power board.

These are +3.3V, +5V and $\pm 12V$. For more information on where to measure these voltages, see the schematic for the power supply. There are also three voltages supplied from the main board. **U12** (23340) supplies the Host and DSP's with +1.8V, **U14** (21540) supplies the audio D/A with +5V and **U37** (25820) which supplies the high level output with +30V. The Power supply is connected to the main board with a 10 pole connector **P2** (22480).

Main Board

The main board is equipped with two DSP's **U8-U9** (23280), which is controlled by a host processor **U7** (23180) with one DRAM circuits **U4** (23170) (1M*16 bits).

Boot code for the host processor is stored in the BootPROM **U32** (23892) (512k*8 bits).

OS is stored in a FLASH memory **U33** (23420) (512k*8 bits).

Various other information, e.g. user settings is stored in an EEPROM **U17** (24147)

Audio D/A conversion is performed by **U21** (23430).

A/D conversion of the control pedal takes place on the panel board **U23** (23370).

All output jacks are filtered from radio signals with an EMI-filter (23110)

(component designator prefix F). External connectors are one 26 pole connector for the

panel board **P5** (22520), a 10 pole connector for the power supply unit **P6** (22480),

a 10 pole straight connector **P8** (25551) for the 11 pin Leslie connector and four keyboard connectors **P1-P4** (22670).

Panel Board

On the panel board you will find all control functions of the Nord C1. This panel also holds the LED (3x20780), the panel board is connected to the main board with a 26 pole connector **P1** (22520).

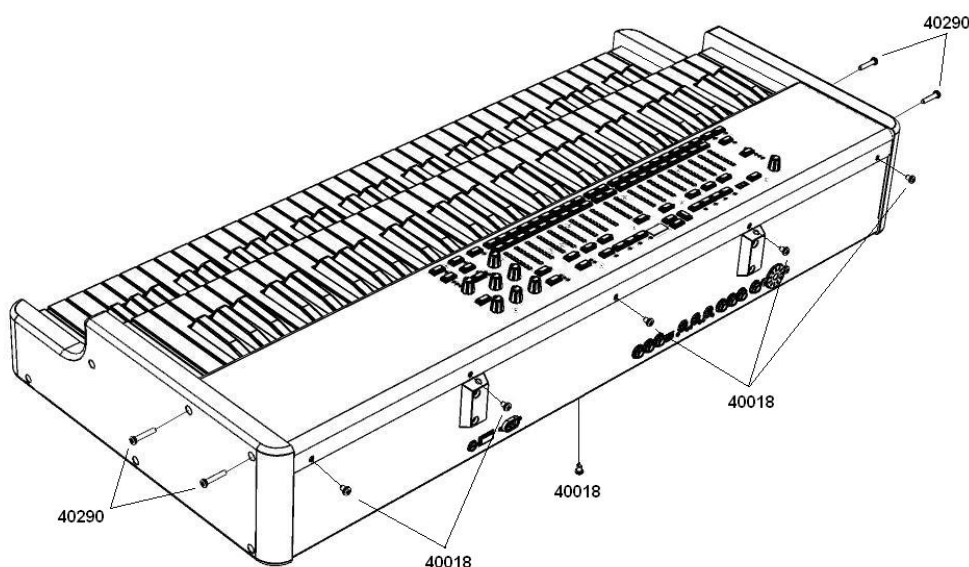
Opening the synth



WARNING: Take necessary precautions against ESD before opening the synth.

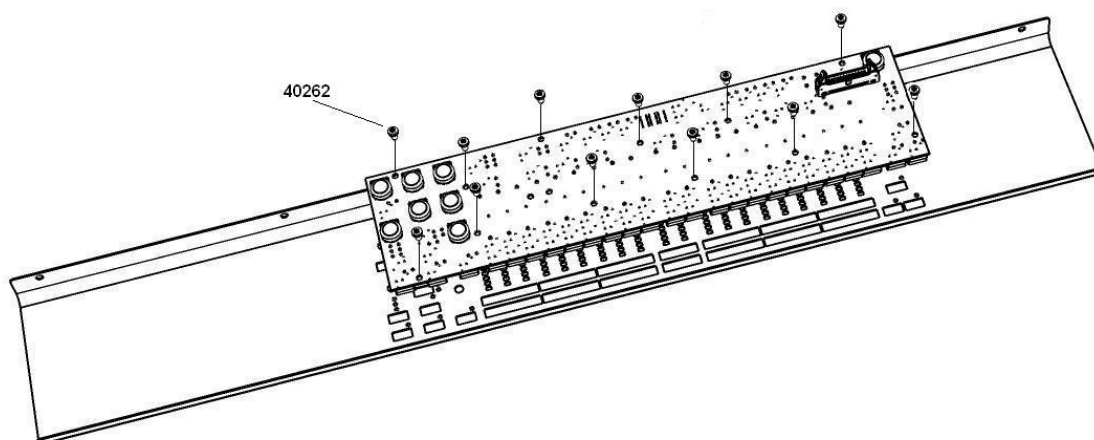
Disassembly Nord C1

1. Remove the 4 screws (40290) holding the panel to the wood gables.
2. Remove the 6 screws (40018).
3. Lift of the upper lid (40273).
4. Disconnect the 26 pole ribbon cable (23830) to the mainboard.



Removing the Panelboard

1. Pull off the knobs (22900).
2. Disconnect the 26 pole ribbon cable (23830).
3. Remove the 12 screws (40262) holding the panelboard.





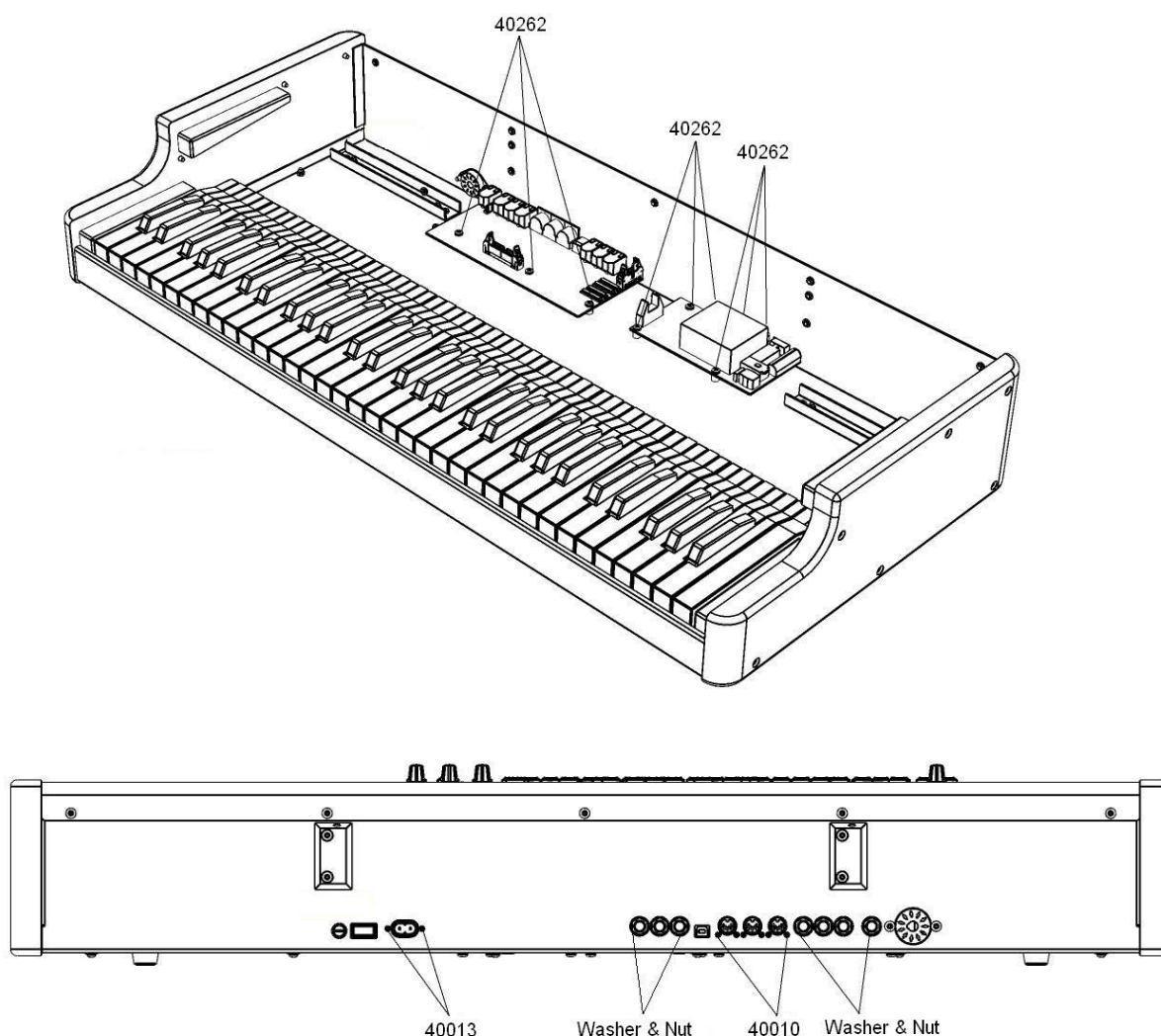
WARNING: Take necessary precautions against ESD before opening the synth.

Removing the Powerboard

1. Remove the 6 screws (40262) holding the Powerboard to the Lower lid.
2. Remove the 2 screws (40013) next to the AC socket.
3. Disconnect the 10 pole ribbon cable (23880).

Removing the Mainboard

1. Remove the 3 screws (40262) holding the mainboard to the lower lid.
2. Remove the 7 nuts and washers holding the 1/4" jacks.
3. Remove the 6 screws (40010) holding the MIDI connectors.
4. Disconnect the 26 pole ribbon cable (23830) to the panelboard.
5. Disconnect the 10 pole ribbon cable (23880) to the powerboard.
6. Disconnect the 10 pole rotary spkr cable (22093).
7. Disconnect the 4 keyboard cables (P1-P2 22290 P3-P4 24100)



Hardware versions

Main board	BootPROM	Notes
ver. 1.0	V1.0-xx	"xx" defines BootPROM version

Hw version is shown in the LED when you turn on the unit.

⚠ Important notes

-The latest available OS version will work on all officially released main board versions, however old OS versions might NOT work on newer main boards.
Always use the latest OS version!

Software

Uploading OS and sounds

The operating system is stored in a FLASH circuit on the main board.
OS and sounds are uploaded via USB.

For more information on how to update the OS Visit
www.clavia.se there you can find the latest Software packages.

Current OS version is shown in the display when you power on the unit.

Spare Parts

Mechanics:

Pos	Part no.	Item	qty
1	40004	Keyboard 5 Oct. NE61	2
2	23830	Ribbon cable 26pol*	1
3	23880	Ribbon cable 10pol*140	1
4	22290	Keyboard cable	2
5	24100	Keyboard cable	2
6	40242	spacer screw M4x10	2
7	40010	Screw, midi	6
8	40013	Screw, AC input	2
9	40039	Screw, keyboard E61/E73	24
10	40018	Screw, upper/lower lid	12
11	40262	Screw M4x6	25
12	40290	Screw, Organ gable	12
13	40038	Screw M4x12, Leslie/bumper	6
14	40068	Pop rivet 3,2x8	4
15	40297	Rubber foot 21mm	4
16	22900	Knob D-form with grey line	8
17	40081	Display window, red N3/N2X	1
18	20850	LED lens shield 6, N3/NE	1
19	40057	Nut M4	14
20	40273	Upper lid NC1O	1
21	40274	Lower lid NC1O	1
22	40275	Distance plate NC1O	1
23	40276	Angle bracket, support NC1O	1
24	40298	Angle bracket NC1O, short	1
25	40239	U-channel	2
26	40299	U-channel NC1O, long	1
27	40280	Wood panel NC1O, left	1
28	40281	Wood panel NC1O, right	1
29	50288	Bumper, Nord Stage	2
30	22093	Cable Rotary spkr complete	1

Panelboard:

Pos	Part no.	Item	qty
31	60112	Panelboard NC1O	1
32	20980	100uF/16V 6,3x6,0 Ellyt SMD	1
33	20960	10uF/35V 5,0x6,0 Ellyt SMD	5
34	20720	Diod Bav 56 sot23	38
35	20700	Diod Bav70 Sot23	1
36	21950	Transistor BCX53 Sot89 PNP	12
37	23310	74HCT374 TSSOP	8
38	25600	74LCX00 TSSOP	1
39	25605	74LCX32 TSSOP	1
40	25608	74LCX245 TSSOP	1
41	25606	74LCX138 TSSOP	1
42	21930	74HC245 TSSOP	1
43	23370	MAX1039AEEE	1
44	21480	OP amp LF353D So 8	1
45	20870	LED lens straight, NE	20
46	20840	LED lens 6, N3/NE	1
47	20860	LED lens single	39
48	20780	LED Eight	3
49	22520	Connector 26 pole	1
50	22030	Button black Nord/ddrum	44
51	22050	Button grey NE	29
52	22040	Button red Nord	1
53	20640	Pot.10kA Lin. Nord	8

Mainboard:

Pos	Part no.	Item	qty
54	60110	Mainboard NC1O	1
55	20980	100uF/16V 6,3x6,0 Ellyt SMD	7
56	20960	10uF/35V 5,0x6,0 Ellyt SMD	7
57	20940	1uF/35V 4,0x5,5 Ellyt SMD	6
58	25500	4.7u ker X7R 50v 1210 Murata	2
59	25305	Diod S1G SMA	7
60	20700	Diod Bav70 Sot23	6
61	25310	Diod S1G SMA Schottky	1
62	23110	EMI-Filter 2,2nF,+50/-20% 100V	17
63	23100	EMI-Filter 470pF,+50/-20% 100V	9
64	25380	Chipdrossel Koa 10uH LPC4045	1
65	21960	Transistor BCX54 Sot89 NPN	5
66	21950	Transistor BCX53 Sot89 PNP	2
67	21970	Transistor BC847B Sot23 NPN	2
68	21980	Transistor BC857B Sot23 PNP	1
69	25290	Relay 2-pol	3
70	21520	Op amp LM833M	2
71	25608	74LCX245 TSSOP	8
72	23170	Dram 16Mbit	1
73	23160	Sram NMG2/NS 4MB	1
74	23180	Host NMG2/NS	1
75	23280	DSP NMG2/NS	2
76	23340	Regulatorv1,8v yt	1
77	21940	74HC374 TSSOP	2
78	21540	Regulator 5,0	1
79	24147	EEPROM NS	1
80	25604	74LCX14 TSSOP	2
81	21810	74HC32 So14	3
82	23430	Dac N2X/NMG2/NS	1
83	25850	Op amp dual so8	2
84	21570	PC 400TSo	2
85	23200	Resetcircuit NMG2/NS	1
86	23420	Flash	1
87	23730	Socket, otp	1
88	23892	BootPROM NC1O, Programmed	1
89	23190	USB circuit NMG2/NS	1
90	25820	Regulator step-up	1
91	25351	Crystal oscillator 16,666 MHz	1
92	23270	Crystal oscillator 56,620363 Mhz	1
93	23060	crystal 6 Mhz SMD	1

Mainboard:

Pos	Part no.	Item	qty
94	22610	Connector 1/4" Stereo/switch	3
95	22600	Connector 1/4" Stereo	1
96	22590	Connector 1/4" Mono	3
97	22640	Connector din 5pol Midi	3
98	22690	USB connector Type B	1
99	22670	Connector 16 pole, micromatch	4
100	22520	Connector 26 pole	1
101	22480	Connector 10pol	1
102	25551	Connector 10pol, straight	1

Powerboard:

Pos	Part no.	Item	qty
103	60183	Power board NMG2	1
104	20960	10uF/35V 5,0x6,0 Ellyt SMD	3
105	23590	Diod ES3AD SMC	6
106	23900	Diod SS34 Schottky	1
107	23600	Effect drossel	1
108	23610	Regulator +5,0 Yt	1
109	23620	Regulator +3,3 Yt	1
110	23630	Regulator +12 Yt	1
111	23640	Regulator -12V Yt	1
112	20910	Capacitor 4700pF X2	2
113	23560	1000u/35V Nichicon	3
114	23800	470u/50V	1
115	22840	Fuse house nord/dd4/mod	1
116	23120	Drossel RN112-0,8/02	1
117	22620	Socket AC N3/NE	1
118	22480	Connector 10pol	1
119	22000	Powerswitch On/off	1
120	22020	Button grey power on/off	1
121	22630	AC-Switch	1
123	22770	Trafo NMG2/NS	1
124	40017	Screw, transformer	4
125	40176	Plastic isolator	1
126	23960	220uF/25V Ellyt axiell	1
127	40180	Spacer 2mm Nylon	2