PARTS LIST

SAFETY PRECAUTIONS:
The parts marked △ have safety-related characteristics. Use only listed parts for replacement.

SN 908100—UP

Prior to SN 908100

Arm #229
(2214022900)

Sleeve #410
(2215041000)

CASING
22020390 Top Cover
22810624 Bottom Chassis
22810625 Front Chassis
22210559 Front Panel
22123548 Right Angle Bracket
22135411 Guide of Button & LED
22200183 Power Switch Holder
22200184 Main Board Holder
22200185 Analog Main Holder
22200186 Rear Jack Holder
22200187 Front Jack Holder
22200188 Card Holder
22200190 Front Holder
22200197 LCD Holder
22004152 LCD Cover
22350313 Foot

PCB ASSY
79454410 Main Board (pcb 2292060501)
79454420 Analog Board (pcb 229206030)
79454440 Power Supply Board (pcb 22920607)
79454430 Switch Board (pcb 22920604-1/2)
Switch and Jack Boards are assembled on the same splittable PCB and supplied in a set of the two with the part name represented by Switch Board.

---------- Jack Board (pcb 2292060400-2/2)

LCD UNIT
15029471 QM0292-5BL7 with LED, PCB and wiring
No replacement for individual parts.

KNOB, BUTTON
22485149 Knob VOLUME
22495365 Button POWER

Prior to SN 927900

22495206 Rack Keytop(s) 5P [EXIT - WHITE/COPT]
22495207 Rack Keytop(s) 3P [EDIT - ENTER]

SN 927900-UP

22495210 Rack Keytop(s) 2P [EXIT - WHITE/COPT]
22495207 Rack Keytop(s) 3P [EDIT - ENTER]

SWITCH
13129724 SQDC D1032A
13129740 EQH-QVT 05G
PSB SW501 SB SW401-416

JACK
13492168 NHJ1-4S
13494125 BLJ-0520-01-110
13499126 BLJ-0520-01-100 A/B M1-4 (MULTI OUT, MIX OUT)
13499128 JB J9 (PHONES)

To be continued
INTERCONNECTION DIAGRAM

POWER TRANSFORMER
- MB = Main Board
- AB = Analog Board
- SB = Switch Board
- JB = Jack Board
- PSS = Power Supply Board

IC
- 15179276 80927B8 MB IC18 (CPU)
- 15449149 UPD72C55600-20 MB IC18 (~100 EP ROM)
- 15179904 L85310-60 MB IC15 (IR Mask ROM)
- 15178787 HUE20346CP99 MB IC7 (8Mbit Mask ROM)
- 15178785 H5623257P220 MB IC6 (256Kbit Mask ROM)
- 15178880 H5623046P110 MB IC8 (4Mbit Mask ROM)
- 15179618 HUE22565L-15 MB IC17 (256Kbit S RAM)
- 15179094 MB4264-12 MB IC14 (4x16Kbit D RAM)
- 15229868 LPD50000G-062 MB IC21 (Gate Array)
- 15229863 H Admin202S6 MB IC5 (Never Chip)
- 15229896 MB23134APF MB IC9 (LA Chip)
- 15239106 H816815-2F7 MB IC16 (EEPROM)
- 151911380 HD140518P AB IC131 (8kb EROM)
- 151912800 HD140538P AB IC114 (Triple 16C DBMX)
- 15165512 TC74HC04P4 MB IC10 (Hex Inverter)
- 15165510 TC74HC04P MB IC11,20 (Quad 2-Input Nand Gate)
- 15165516 TC74HC02P MB IC14 (Quad 2-Input Nor Gate)
- 15165537 TC74HC27P MB IC12 (Triple 2-Input And Gate)
- 151655400 HDL4000SP MB IC13, AB IC120 (Hex 16V with Open Collector)

TRANSISTOR
- 15191113 28A-1015GK AB Q01,104,105
- 15219115 2SC-1815 MB Q1,2
- 15219137 2SC-2878A MB Q07,103
- 15219171 DTC-114S-PT MB Q3

DIODE
- 15091325 1N914-133 1N1082, AB 1N108,107
- 15091293 38461 SLB-13 MW 3F
- 15092966 SLB-13 MW 3F

XTAL
- 12389746 HC-49/0 12MHz MB X2
- 15299108 HC-90/0 16.384MHz MB X1

COIL
- 12395001MB B026GEK-R62 MB LI-4, AB L101-103 (EMI Filter)
- 12449229MB FB08160B15 MB F501, F501 (Line Filter 1.5kHz)

RESISTOR
- 13819547 8.2 1W/2 MB R5
- 13819619 10.1 1W/2 MB R7
- 13819713 10G 1W/2 MB R10
- 13919503 33K x 8 MB R01,2,3

CAPACITOR
- 13392010 DE7150F63J2WAD MB C01,102,120 (Line Filter 4700pF)
- 13392141 10V/100UF AL MB C16 (Phillips 125109)
- 13392530 470UF/16V MB C17 (electro)
- 13392550 2200UF/25V MB C18 (electro)
- 13392500 2200UF/35V MB C17,112 (electro)
- 13392220 10V/16UF BP MB C102,108,114,120,126 (130,132,138,144)
- 13392230 47UF/16V BP MB C151,152

POLENTIOMETER
- 13279873 BUV-99AP158S4 MB V02 (VOLUME)
- 13291917 BDUNA490BB5 MB V101

CONNECTOR
- 12195570 BHB-1 MB Battery Holder
- 13429168 MID13-RS MB CN5 (MIDU IN, OUT, THRU)
- 13429133 7500095A MB CN8 (MEMORY Card)
- 13429234 J8T6-1.5-5 MB CN6
- 13439333 IL-5-2P-227-EF MB CN7
- 13439296 IL-5-7P-227-EF MB CN8, MB CN2
- 13439365 IL-5-9P-227-EF MB CN1, CN3, CN3, MB CN3
- 13439298 IL-5-10P-227-EF MB CN5
- 13439365 IL-5-10P-227-EF MB CN4, MB CN5
- 13439506 RF-414 2JD-1190 MB CN1
- 13439174 B22-B4A MB CN4

CONNECTOR (m/leads)
- 22410619 34-619 2P (MB CN7 - LED)
- 22410620 34-620 2P (MB CN2 - AN CN2)
- 22410621 34-621 2P (MB CN3 - AN CN3)
- 22410622 34-622 2P (MB CN5 - SB CN7)
- 22410623 34-623 2P (MB CN6 - AN CN4)
- 22410824 34-624 2P (MB CN6 - AN CN4)

AC CORD
- 134398010V VFF 2.5m 100V
- 1343983600 VFF 18-2.5m 110V
- 1343983650 VFF 18-2.5m 230V
- 134399111 UK Moulding CORD 240V (England)
- 1343980800 KS-550 LTS-A-3 2.5m 240V (Australia)

MISCELLANEOUS
- 12236523 CR4-1 Card Bushing 100V/220V
- 12236532 CR-1 Card Bushing 117V
- 12236531 CR-5 Card Bushing 240V
- 22190943 Cord Bushing Bracket 100V/220V/240V
- 22190942 Cord Bushing Bracket 117V
- 22190941 Heat Sink
- 22194041 CR202-18S Lithium Battery (~3V)
- 22020866 Insulation Sheet (fibre)

Prior to SN981000 (Refer to Fig. A on page 3.)

- 22192419 Arm #219 Power SW - Sleeve #405
- 22150404 Sleeve #405 Arm #219 - Sleeve #406
- 22150405 Sleeve #406 Arm #219 - Sleeve #406
- 22150406 Sleeve #406 Sleeve #405 - Button

- 12230841 B026GEK-R62 MB LI-4, AB L101-103 (EMI Filter)
- 12449229MB FB08160B15 MB F501, F501 (Line Filter 1.5kHz)

RESISTOR
- 13819547 8.2 1W/2 MB R5
- 13819619 10.1 1W/2 MB R7
- 13819713 10G 1W/2 MB R10
- 13919503 33K x 8 MB R01,2,3

LB UNIT DM029Z-5BL7

LCD UNIT includes connectors with leads.
MAIN BOARD
ASSY 79454410
(pcb 2292060501)

ADVARSEL!
Lithiumbatterier. Explosive.
Uskiftning må kun foretas av en saglydig
og sunt bekjent i servicemåten.
Lithiumbatteriet må kun utskiftes med samme type
og fabrikat.

ADVARSEL!
Lithiumbatterier. Forspennings.
Må ikke skiftes av kvalifiserte tekniker som
beskrevet i servicemåten.
Lithiumbatteriet må kun utskiftes med samme type
og fabrikat.

VARNING!
Lithiumbatterier. Explosives.
For endast byttes av kvalifiserte tekniker.
Se instruksjoner i servicemåten.
Lithiumbatteriet må kun utskiftes med samme type
og fabrikat.

VAROITUS!
Lithiumbatterie. Varovarakset.
Panssit saa vahva asennaskul
jaan annettimas.
Lithiumbatterien saa vahva asennaskul
jaan samatt yksiköllä.

Kun vahat lithium panston KARTTA saa vahdita
jaan samalla tyypillä.

View from component side
**JACK BOARD**

Switch Board Assy 79454430 (pcb 22920604 1/2)

**IC Data**

- Quad 2-Input NAND Gates
- Hex Inverters (with Open Collector Outputs)
- Quad 2-Input NOR Gates
- Triple 3-Input AND Gates
- Hex Inverters

**Switch Board Assy 79454430**

(jack board pca 22920604 2/2)
TEST MODE and ADJUSTMENT

PREPARATIONS

Connect a MIDI cable across MIDI OUT and MIDI IN.
Connect a MIDI cable across MIDI THRU and MIDI IN
of the other MIDI device.
Connect headphones to PHONES.
Connect a monitor amplifier and a scope to MIX OUT R
and a dummy (open-circuit) plug to MIX OUT L.

START

Hold down the two bottom right-end keys and switch
power on. The message shown below appears.

CHECKING SWITCHES

Press all the 16 keys in any order, "all switch ok"
indicates that all keys are normal.

CHECKING PIANO TONES

Press any of the eight bottom keys to play the corres-
ponding piano tone.
(After the key is pressed, the corresponding piano tone
is kept generated at intervals of several seconds.)
CHECKING REVERBERATION
Press any of the top seven left-end keys to generate the corresponding reverberated sound. (After the key is pressed, the corresponding sound is kept provided at the predetermined intervals.)
At this time, check that the MIDDLE MESSAGE LED is lit. With the headphones on, check the reverberated sound and the headphone amplifier tone quality. Make sure that the VOLUME knob functions.

CHECKING MULTI OUT
Press WRITE/COPY to provide different sine waves (approx. 3IVpp) from the eight jacks. Connect the monitor amplifier inputs to the jacks one by one in due order and check the MULTI OUT outputs.

D/A ADJUSTMENT
Hold down ENTER and press the WRITE/COPY key to enter the D/A adjust mode.

At this time, micro-leveled sine waves (approx. 3mVpp) are output from MIX OUT. While checking the waveform by the eye on the scope and by the ear, adjust VR101 on the analog board until the sine wave distortion is minimized.

CHECKING MIDI
Press EXIT to start self-check of MIDI OUT and IN. "MIDI OUT/IN OK" indicates that MIDI is without any fault. At this time, connect the other MIDI equipment to MIDI IN and check that the MIDI signal is provided from CH1.

If "MIDI OUT/IN ERR" indicates a MIDI error. Press EDIT to repeat the check.

D/A M/4 Adjust
all switch ok

MULTI out
all switch ok

D/A調整
[ENTER]を押しながら、[WRITE/COPY]キーを押すと、D/A調整モードに入る。

TESTING RAM CARD
Press EXIT to enter the RAM card test mode.

Insert an unprotected RAM card (256kbit) and press ENTER. "r/w ok" indicates that the RAM card is normal. In this case, the D-110 automatically progresses to the internal RAM test mode. At this time, the RAM card data is destroyed. "r/w error!" indicates a RAM card error. Press EXIT to progress to the internal RAM test mode.

TESTING INTERNAL RAM
Press ENTER to check the internal RAM (IC17). Note that data is corrupted by this test.

"r/w ok" indicates that the internal RAM is normal. At this time, the D-110 automatically returns to the play mode.

"r/w error!" indicates an internal RAM error. Press EXIT to return to the normal status.

COMPLETION
After the tests are completed, D-110 automatically returns to the play mode.

IDENTIFYING ROM (IC19) VERSION NUMBER
Press and hold the three keys shown below and then turn the switch on. The display should show the current ROM version number as well as acknowledgement followed by normal mode message.

ROM(19)バージョン・ナンバーの確認
下図に示す3つのキーを押しながらパワーオンすると、右のように表示した後、自動的に通常状態に入ります。

Version Number
D-110 ver 1.06
Apr. 5, 1989
変更案内

○ヒューズF501（電源基板）
ヒューズとヒューズホルダを削除し代わりジャンパ線挿入する。
実施製品 88000-89209
実施日 892906
理由：ウクレル関係の温度ヒューズが動作している三路線を
起こさないようにするため。
注）100V仕様の製品88100-88799、89210-89297にはヒューズが
装備されていないがジャンパ線にかかっても問題
有りません。

○Mechanical Parts
Sleeve #041
Sleeve #045 to Sleeve #40
Sleeve #046 Arm #29
Arm #29
Power Switch Holder
（Refer to "EXPLODED VIEW Fig. A" on page 3 for more details.）
EFS SN 908100-UP
REASON: To lower the material cost.

○Mechanical Parts
Sleeve #041
Sleeve #045 to Sleeve #40
Sleeve #046 Arm #29
Arm #29
Power Switch Holder
（Refer to “EXPLODED VIEW Fig. A” on page 3 for more details.）
EFS SN 908100-UP
REASON: To lower the material cost.

○アナログ基板パターン
pcb 2290602 from pcb 2290603
実施製品 9148013
理由：IC15, IC18 を差し込み基板ができないようにす
る為

○IC15（メイン基板）
LHS310-07  to LHS310-DJ
EFS SN 979000-UP
REASON: Improvement on ROM play data (demon- stration data).

NOT: When replacing Mask ROM (IC15) from
LHS310-07 to LHS310-DJ, EP-ROM (IC19) on the main board must be changed to Ver.1.07-up.

○Mechanical Parts
Key Top 1P  (4 pcs.)
Key Top 2P  (2 pcs.)
Key Top 3P  (4 pcs.)
（Refer to “EXPLODED VIEW” on page 2.）
EFS SN 979000-UP
REASON: For better productivity.
ver. 1.06 cures the following bugs.

- In either "Dum One Way" and "Dum Hand Shake" of Data Transfer mode, no tone except for "D" may be output.
- In Handshake mode of Exclusive, even if an E0H (End of Exclusive) message is received, D-110 won’t send an ACK (Acknowledgment) message.
- If in MIDI Exclusive, each part parameters stored in Patch memory area cannot be read/written properly.

- In Exclusive, when "Rhythm Setup" is executed, data cannot be read/written from/to the location of key numbers over 88E6.
- In "Dum One Way" or "Dum Hand Shake" of Data Transfer mode, the last 64 bytes data of Patch memory area are not output.
- When select correspond to a VFD (Want to send data) does not execute.
- In "Save to Card"("Rhythm Setup" or "All") of Data Transfer mode, the data for key numbers over 88E6 cannot be saved onto a memory card.
- In "Dum Hand Shake", if D-110 is not connected to any MIDI device, D-110’s display shows "Exclusive buffer overflow".
- When "Overflow Assign" function is on; if "Dum Hand Shake" is executed, "request data" is output to MIDI OUT forcibly.
- In "Dum Hand Shake" of Data Transfer mode, if D-110 is not connected to any MIDI device, D-110 will be locked up.
- In "Dum Hand Shake" of Data Transfer mode, if an R0C (Rejection) message is received, D-110 might be locked up.
- When "Overflow Assign" function is on; if "Dum Hand Shake" in Data Transfer mode is executed, D-110 might be locked up.

IMPROVEMENT

- When parameters are changed using MIDI exclusive, the display will show "x" marks with Pitch, Timbre and Tone numbers.

Ver. 1.07 cures the following bugs.

- When structures 10/11/12 using Ring Modulator are selected, the volume controls (Output Level, Volume and Expression) do not work.
- When structures 10/11/12 using Ring Modulator are selected; if one of the partials is muted, unexpected sound might be output.
- In "Dum One Way" of Data Transfer mode, the interval between exclusive messages is only 5 ms. They should be at least 20 ms. (As this, when D-110’s data is transferred to WS-5001 Roland sequence) and then sent back to the D-110 again, the data cannot be received properly by D-110.
- When receiving exclusive messages which do not includes any data except for "FU" and "FP", D-110 may be locked up.

IMPROVEMENT

- In "Dum Hand Shake" of Data Transfer mode, the number of WS-5000 (Want to send data - End of data) routine is reduced to only one time.

[Up to Ver. 1.06: WS-5000 (Bulk Librarian) could not recognize D-110’s data as one file because of plural WS-5000 routines.]
- An Error Message in the display remains keeping until a panel switch is pressed.
- When D-110 changes MIDI channel while the D-110 is outputting sound, the D-110 will output "Note Off" message.

下記の症状が改善されています。

- リズム音のみを使用したスタイル(10, 11, 12, 13)の時、音量調整が不適切な時、パッチの音色が変動しない。
- リズム音のみを使用したスタイル(10, 11, 12, 13)の時、音声のピーチを比べた時の音色が変動しない。
- データ伝送時のデータの切断が5msしかありません。これは不適切です。
- データ伝送時のデータの通電が5msしかありません。これは不適切です。

下記の症状が改善されています。

- データ伝送時のデータの切断が5msしかありません。これは不適切です。
- データ伝送時のデータの通電が5msしかありません。これは不適切です。

RECOVERING FACTORY DATA

RECOVERING FACTORY DATA

Holding down WRITE/COPY, turn the switch on and press ENTER:
The factory preset data (Timbre memory and Rhythm Setup) are initialized to the original value.

TONE MEMORY AND PATCH MEMORY

To copy the factory preset data (Timbre memory and Rhythm Setup), prepare the memory card(D-110 FACTORY PRESET card) and then follow the procedure described below.

procedure

1. Insert a Memory Card(D-110 FACTORY PRESET card) into the card slot.
2. Press WRITE/COPY.

3. Press PARAMETER/GROUP/△ and select "Load from Card".
4. Press PARAMETER/BANK/△ and select "All".
5. Press ENTER.
6. WRITE/COPY.

When the data has been transferred properly, the display reads "Complete." Then return to the Play mode indication.

(Memory Protect is automatically returned to ON.)
Part number error. Please amend all existing service notes as follows.

/ パーツコードに誤記がありました。該当サービスノートを下記のように訂正して下さい。

Page 2 EXPLODED VIEW / 分解図 : #36
Page 4 PARTS LIST / パーツリスト : MISCELLANEOUS / その他

WRONG / 誤: LITHIUM BATTERY (+3V) CR2032-1HS #12569410
CORRECT / 正: LITHIUM BATTERY (+3V) CR2032 #12569249S0