Level Control Systems Matrix^3

System DSP EPROM Upgrade

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Copyright and Trademark Information

Important Safeguards

Warning: Comply with Safeguards
Comply with all warnings and cautions indicated on the product or provided in this manual. Failure to do so could result in damage to equipment and/or injury or death to personnel.

Warning: High Voltage
Sufficient electrical potential exists within the LX-300 unit to cause severe injury or death to personnel if mishandled, damaged or serviced carelessly. Always power-off the unit and disconnect the primary electrical power when access for servicing or repair is required.

FCC Warning
Any unauthorized changes or modification to this equipment would void the user's authority to operate.

CSA Warning
In order to maintain the integrity of the fire/electrical enclosure of the LX-300, circuit card assemblies that are removed from the card cage of the unit must be replaced with either a similar circuit card assembly or a filler plate of the appropriate size. Unpopulated slots in the card cage must also be covered with filler panels. Failure to comply with these safety instructions may result in a potential fire or shock hazard.

The filler panels are attached to the card cage using captive, spring-loaded thumbscrews of the same type as found on the circuit card assemblies. These filler panels are available from LCS.

Avertissement CSA
Afin de conserver l'intégrité de la protection contre le feu et les chocs electriques, toute carte électronique retirée du chassis LX-300 doit etre remplacée par une carte du meme model, de meme dimensions ou par une carte vierge (disponible chez LCS.) Les emplacements vides doivent aussi etres recouverts d'un panneau vierge. Ces panneaux vierges sont attachés au chassis à l'aide de vis-à-ressorts tel que l'on retrouve sur la majorité des cartes à circuits imprimés. L'omission de ces cartes et panneaux porte des risques d'incendie et de chocs electriques.

Caution: Electrostatic Discharge Sensitive (ESDS) Components
Circuit card assemblies within the LX-300 unit contain ESDS components. To prevent damage, ESDS handling procedures, anti-static handling equipment and anti-static storage envelopes must be used during removal/installation of all circuit card assemblies.

Conditions Requiring Immediate Servicing
This product requires immediate servicing under the following conditions. Power-off, unplug the AC power cord and refer servicing to a qualified service technician.

- When the power supply cord or plug is damaged.
- If liquid has been spilled or objects have fallen on the product.
- If the product has been exposed to rain or water.
- If the product has been dropped or the chassis or cards have been damaged.
- When the product exhibits a distinct change in performance.
- If the product does not operate normally when following the operating instructions.

Compliance
This equipment has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications set forth in CFR47, Part 15B of the FCC Rules. If this equipment does cause interference to radio or television reception, which may be determined by turning the equipment on and off while observing any effects on radio or television reception, move the equipment to another location and/or utilize an electrical outlet different from that used by the receiver.

This digital apparatus does not exceed the Class A limit for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communication.

The manufacturer's Declaration of Conformity implies that this device was tested at a laboratory recognized by the FCC and found to meet the limits for a Class B digital device. This device has not been certified by the FCC.

LCS

Introduction 1

Overview

LCS has improved and expanded the firmware on the LX-DSP system DSP boot EPROM. The new EPROM provides expanded self-diagnostic test functions and improves system performance.

This manual explains how to replace the system DSP EPROM.

Skills Required

Working with electrostatic discharge sensitive components; removal/installation of ICs.

Before You Begin

Please read *Important Safeguards*, page iii, for safety information.

Document Conventions

This document uses the following typographical conventions:

Example	Description
Normal	The body of the manual
Attention	**Cautions, Warnings and Notes**
Title	*Cross-reference*

Related Documentation

None required.

LCS

Replacement Procedure 2

Overview

The test unit will be disconnected from the *Matrix*^{3} system. The LX-DSP system DSP card will be pulled, and an EPROM swap will be performed. The card will be re-installed to the system after recording its serial number.

Please refer to *Important Safeguards*, page iii.

Required Tools and Components

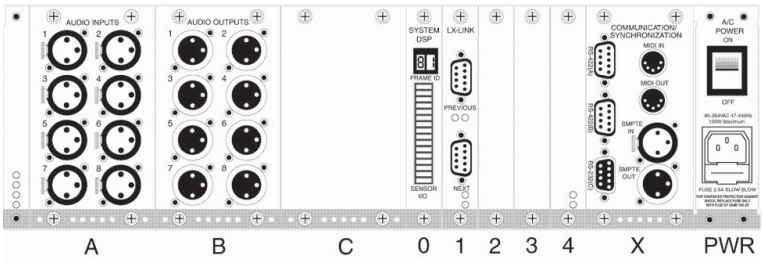
You will require the following tools:

- Anti-static equipment, including a personal grounding strap.
- #2 Philips screwdriver.
- EPROM Replacement Kit:
  - LX-DSP system DSP boot EPROM.

Components Identification

The LX-300 Chassis holds up to nine expansion cards. Several of these cards must be assigned to specific slots: the LX-DSP system DSP card is always installed to slot 0. Note: slots are not numbered sequentially. Refer to the diagram below:

Figure 1
Back Panel Slot Assignments



Slot	Valid Card Assignments
0	LX-DSP system DSP card.

Work Procedure

Disconnect Unit

1. Disconnect the unit from the *Matrix*^{3} system.
   - Power-off the test unit. Attach an anti-static grounding strap to yourself and to the test unit.
   - Document the unit configuration. Tag and label all cables and record the Frame ID, so that you can restore the unit to its original setup after testing.
   - Disconnect all cables.

Warning
Failure to disconnect the unit from other equipment may result in damage to the unit or to the other equipment.

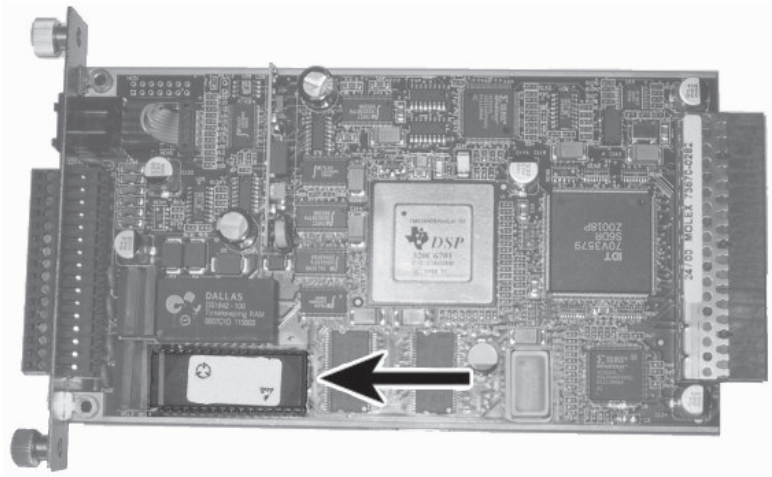
Remove LX-DSP Card

2. Identify and replace defective LX-DSP system DSP Cards.
   - Using a #2 Philips screwdriver, remove the LX-DSP system DSP card and place it on an anti-static working surface..

Remove the Original Boot EPROM

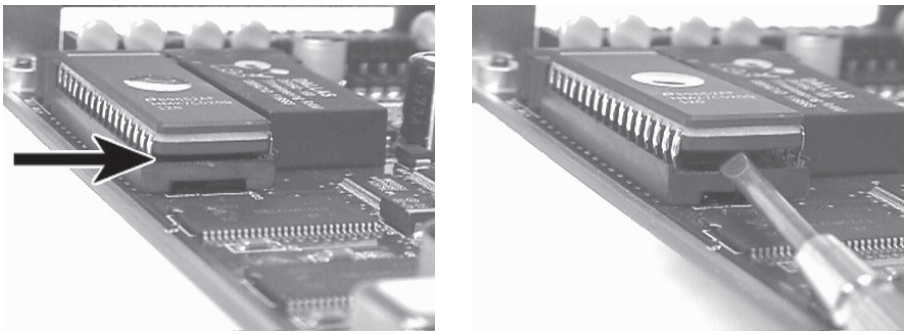
3. Is this the first time you've extracted a chip? Please refer to *Chip Extraction Tips,* page 5.
   - Locate the DSP boot EPROM, as illustrated below..

Figure 2
Location of EPROM



- Carefully slide a small flathead screwdriver between the EPROM and the EPROM socket. Refer to the figure below. Do not insert between the chip socket and the printed circuit board!
- Using a gentle twisting motion, slowly and evenly raise the chip from its socket. Work slowly and carefully. Gently move the screwdriver further down the underside of the chip, gradually lifting it from its socket.

Figure 3
Insert Screwdriver and Gently Twist



Warnings
Do not allow the screwdriver to scratch the printed circuit board (PCB). Damage to the PCB will destroy the LX-DSP system DSP card.

Do not lever the screwdriver against other electronic components. Pressure against components will cause damage to them.

Chip Extraction Tips

Your goal is to remove the chip without bending the legs.

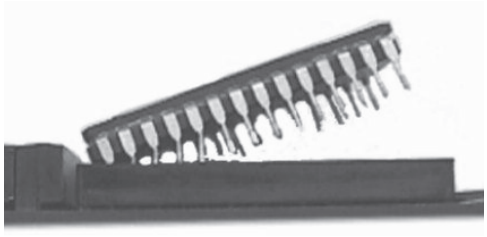
When the socket releases the legs, the chip will have a tendency to “leap” out at an angle. If the chip begins to angle upward, press the high end back down.

You will find that you can “rock” the chip out of the socket by alternately pressing it upward with the screwdriver and levelling it back down with your fingers. The key to success is to do these actions at nearly the same time, slowly, firmly and patiently.

Please read all the instructions in Step 3 before removing the chip.

If the legs do bend, refer to the sidebar on page 8.

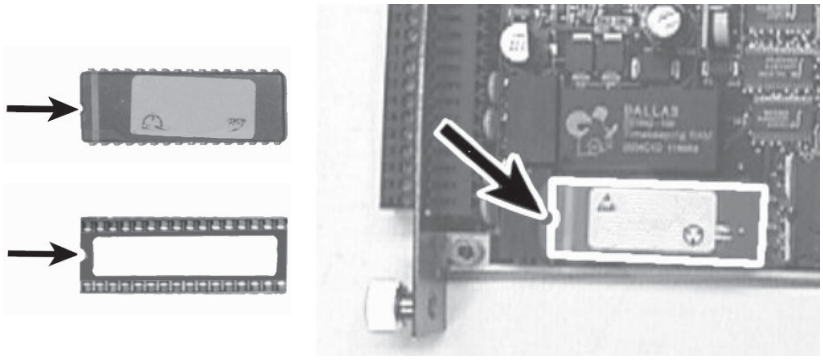
Don’t Do This!



Install the New Boot EPROM

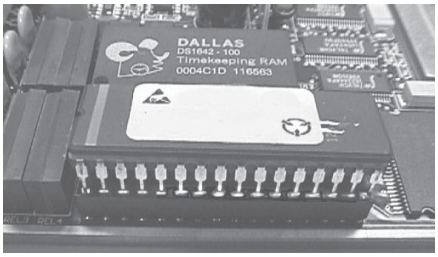
4. Install the new EPROM.
   - As illustrated below, the EPROM has a “notch” at one end. The EPROM socket is also notched. When you insert the chip, these notches must align.
   - Gently place the EPROM on the socket. Ensure that you have oriented the chip correctly: the notch on the EPROM will match the notch on the socket. Both notches “point” toward the back panel of the circuit board.

Figure 4
Insert with Notches Aligned



   - Check that the legs of the EPROM are aligned with the socket holes (silver metal tabs). Refer to the illustration below. Pay particular attention to the legs at either end of the chip.

Figure 5
Align Pins

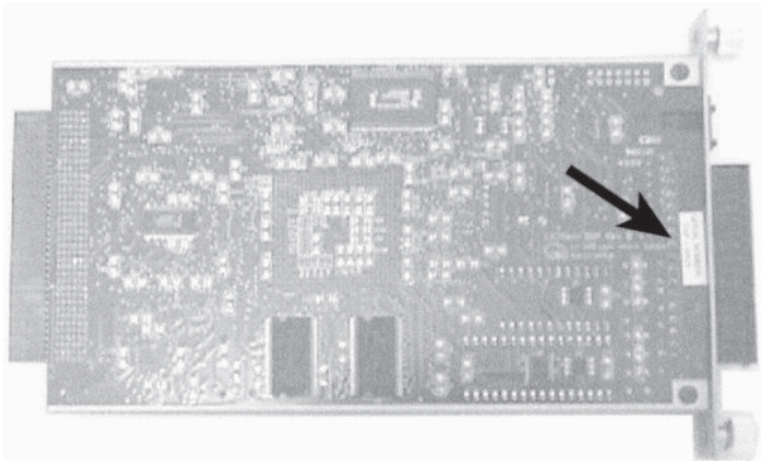


   - Place the card flat on your work surface. Double-check that the chip is correctly positioned.
   - Position your thumbs at either end of the chip, and press it firmly and slowly into place.
   - If you mangle the legs, check the tips in *Bent Legs?,* page 8.

Record Serial Numbers

5. Record the card serial number, and the EPROM version numbers to the *Serial Number Record* on page 9. LCS requires this information in order to provide continued warranty service.
   - The location of the card serial number is illustrated below.
   - The EPROM version numbers are written on the chip labels.

Figure 6
Card Serial Number



Re-install the DSP Card

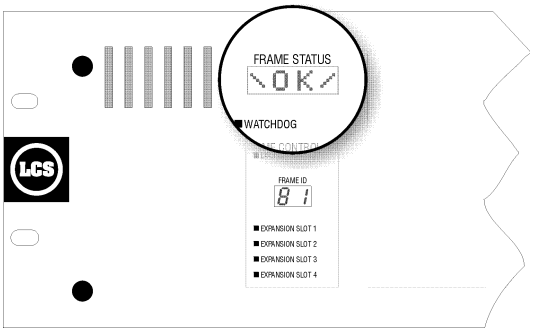
6. Ensure the unit is powered-off.
   - Install the replacement LX-DSP system DSP card. Snug the attachment screws firmly without over-tightening.
   - Re-attach the cables as labelled. Ensure the Frame ID is set correctly. Attach the power supply cable and power-on the unit.

Test the Unit

7. Test the unit to ensure that the EPROM is viable.
   - Power-on the unit. Observe the front panel display.
   - Wait as long as two (2) minutes for the unit to finish booting. The Frame Status will display several messages and perform a progressive front panel display test as it boots.
   - The unit has successfully booted when the Frame Status

shows an animated "\OK/" and a green Watchdog indicator, as shown below.

Figure 7
Success!



Troubleshooting

8. If the unit fails to boot, work through the following troubleshooting procedures.
   - Repeat the LX-DSP system DSP card remove procedure as described previously. Check that the EPROM is correctly oriented (notch toward the back panel) and that no legs were bent under the chip. Re-install the card if it appears that everything is correct, and test the unit again.
   - Repeat the EPROM removal and installation procedures as described previously. Remove the EPROM, repair any bent legs and re-install it. Test the unit again.
   - Restore the original EPROM by repeating the EPROM removal and installation procedure. Test the unit again.
   - If the above procedures fail to restore the unit, contact LCS customer service. Refer to *Vendor Information*, page .

Bent Legs?

The legs on an EPROM are surprisingly forgiving. In repairing bent legs, your goal is to shape and move the legs as little as possible. When over-worked, the legs become brittle and snap off.

If a leg is straight but is mis-aligned, hold the chip upside-down and slowly move the leg by hooking it with your fingernail and dragging it into place.

If the leg is crooked or bent, you may need to use a small screwdriver or fine pliers to press the leg straight. Again, work slowly and carefully.

If a leg snaps off, the EPROM is destroyed. It is impractical to repair the chip. You will need to contact LCS and arrange for another replacement EPROM.

Serial Number Record 3

Record the corresponding old and new EPROM serial numbers using the table below. Use a second sheet if required. Fax the completed form to the LCS DSP Upgrade Program, as noted below.

Company Name	
Technician	
Contact Phone Number	
Contact Email Address	
Date	

DSP Serial Number	Old EPROM Version	New EPROM Version

Fax Completed Document To:
LCS DSP Upgrade Program C/o Michael Dascenzo Fax: 250.549.2668

LCS

Vendor Information 4

Customer Service

For troubleshooting support, please contact one of our product specialists (9AM—4PM Pacific Standard Time).

Tel: 626.836.0446

Fax: 626.836.4883

E-Mail: support@lcsaudio.com

Return Authorization

Please obtain a return authorization from LCS before shipping equipment to our repair depot. Contact our customer service personnel, as above.

Return Depot Address:

Level Control Systems

130 East Montecito Ave.

Sierra Madre, CA, USA

91024

Website

Further information is available on our corporate web-site:

http://www.lcsaudio.com/

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Corrected Text or Description of the Error	
Date	

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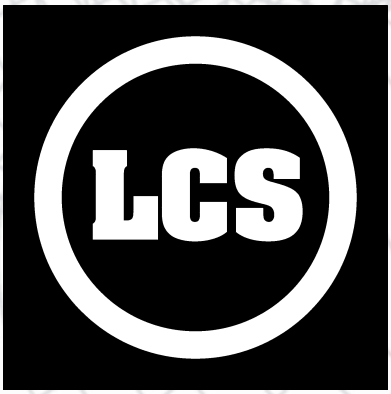
Fax or Send the Completed Document To:
LCS Documentation Department #42–100 Kalamalka Lake Road Vernon, BC, Canada V1T 9G1 Fax: 250.549.2668



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