CARVIN XDRIVE
DCM-Lx Series Operation Manual

DCM2000Lx
DCM3800Lx

DCM2004Lx

Concert audio has to be uncompromising, reliable and efficient. Carvin power amps have made their mark serving top artists and concert venues for decades.

The DCM-Lx series power amps with CARVIN's X-Drive™ signal processing incorporate the flexibility of digital control with the exceptional sound and durability of DCM power. Take full control of your amps from the front panel or via USB to Microsoft™ / Mac™ laptops using the Xdrive™ software with highly effective processing for live use or installations. All models incorporate large heat sinks, high headroom power supplies and lightweight aluminum main frames - all backed by a solid 3 year warranty. Exceptional sound and reliability combined with the flexibility of DSP and ultra-light weight make the DCM-Lx a valuable addition to any rack system.

<u>GETTING STARTED</u>: An easy way to get familiar with the features of the DCM-Lx is to download the free Xdrive™ software on your computer. Just run the software and press the blue button with the product name. The control window will appear:

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1. Safety and Warranty Information

IMPORTANT! FOR YOUR PROTECTION, PLEASE READ THE FOLLOWING:

WARNING: This product produces high sound pressure levels that could damage hearing. Use with caution.

CAUTION: RISK OF ELECTRIC SHOCK, DO NOT OPEN.

WATER AND MOISTURE: Electronic equipment should not be used near water (near a bathtub, washbowl, kitchen sink, laundry tub, swimming pool, etc). Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

POWER SOURCES: The electronic equipment should be connected to a power supply only of the type described in the operating instructions or as marked on the electronic equipment.

GROUNDING OR POLARIZATION: Precautions should be taken so that the grounding or plug polarization means of an electronic equipment is not defeated.

POWER CORD PROTECTION: Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them.

SERVICING: The user should not attempt to service the electronic equipment beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel. If your unit is equipped with a fuse receptacle, replace only with the same type and value fuse. Refer to the replacement text on the unit for correct fuse type.

This equipment has been tested and complies with international safety standards.

LIMITED WARRANTY
Your Carvin DCM power amp is guaranteed against failure for 3 YEARS unless otherwise stated. Carvin will service and supply all parts at no charge to the customer providing the unit is under warranty. Shipping costs are the responsibility of the customer. CARVIN DOES NOT PAY FOR PARTS OR SERVICING OTHER THAN OUR OWN. A COPY OF THE ORIGINAL INVOICE IS REQUIRED TO VERIFY YOUR WARRANTY. Carvin assumes no responsibility for horn drivers or speakers damaged by this unit. This warranty does not cover, and no liability is assumed, for damage due to: natural disasters, accidents, abuse, loss of parts, lack of reasonable care, incorrect use, or failure to follow instructions. This warranty is in lieu of all other warranties, expressed or implied. No representative or person is authorized to represent or assume for Carvin any liability in connection with the sale or servicing of Carvin products. CARVIN SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

SERVICE:
  In the USA: www.carvinservice.com
   Outside the USA, contact your dealer or go to http://www.carvinworld.com for your nearest service center. Include a written description of the problem with serial number and date of purchase.

MAINTAINING YOUR EQUIPMENT
Avoid spilling liquids or allowing any other foreign matter inside the unit. The panels of your unit can be wiped from time to time with a dry or slightly damp cloth to remove dust and help restore it's new look. As with all pro gear, avoid prolonged use in caustic environments such as dust or salt air. When used in such an environment, be sure the unit is adequately protected by a cover.

Please record the unit's serial number, invoice number and invoice date (purchase date).

Serial No.:_____

Invoice No.:_____

Invoice Date:_____

2. Introduction

The DCM-Lx amplifiers can be configured for stereo, parallel, bi-amped, or bridged outputs. The DCM2004Lx quad amp also offers dual bi-amp and three- or four-way outputs to power up to a 4-way speaker system with a single unit. The System Quick Setup feature makes output routing and crossover configuration easy. Loadable Speaker Presets tuned for specific CARVIN speaker cabinets provide optimized settings to get the most out of each element in your system. The DCM-Lx includes 30-band graphic EQ's on each input, 4 parametric EQ's on each output with high and low crossover filters; Bessel, Butterworth or Linkwitz-Riley (6 to 48dB/oct.), Limiters with Threshold, Phase, and Delays up to 120mS for distance or for individual driver alignments. Onboard memory has enough storage for 16 complete system configurations with settings for multiple loudspeakers and line arrays, or store unlimited configurations on your laptop. Premium 24-bit A/D and D/A converters offer low noise with full 20-20kHz bandwidth with extremely low latency processing.

FRONT PANEL & CONNECTING UP

The DCM-Lx front panel features a high-contrast 2x16 character display for clear and easy navigation through settings. LEDs for Signal, 50%, 80%, Clip and Protect monitor the status of the amp. Detented level controls prevent unexpected level changes. Balanced XLR and TRS input connectors are used to reject hum & noise. A Ground Lift switch removes the chassis ground from the inputs. Outputs feature heavy duty binding posts and Twist-Lock connectors allowing bi-amp routing on a single 4-pin cable with no adapters.

CONSTRUCTION

Every DCM-Lx amp is personally tested, which includes a full burn-in under load.

Construction starts with a heavy duty 2U aluminum chassis and steel rackmount face panel. All circuit cards are double-sided military-grade FR4 fire retardant with plated thru holes so parts are soldered from the bottom side through to the top. SMT (surface mount technology) offers high precision and "shock-proof" protection. The CB and CE safety seal assure that each DCM meets strict standards anywhere in the world.

HIGH POWER TOPOLOGY

The DCM-Lx's high headroom reveals the dynamic power available from its switch-mode power supply. Operating at 100,000 Hz, the highly efficient switch-mode supply reduces AC power required from the wall, overall weight, and is AC generator friendly. The soft-start prevents the DCM-Lx from tripping AC breakers. Extreme currents are delivered to even the most demanding 2 ohm and bridged 4 ohm subwoofer systems easily handling the most difficult reactive loads. Class D outputs deliver maximum power amp efficiency.

EFFICIENT COOLING

An important key to reliable power is a high efficiency heat transfer system. CARVIN DCM-Lx amplifiers offer advanced cooling with high ratio 6063-T5 flow-through aluminum heat sinks to remove heat fast and keep power devices within thermal limits. Multi-speed fans pull air from the rear and exhaust to the front to keep your rack cool and run quiet even at 2 ohm loads.

3. REAR PANEL
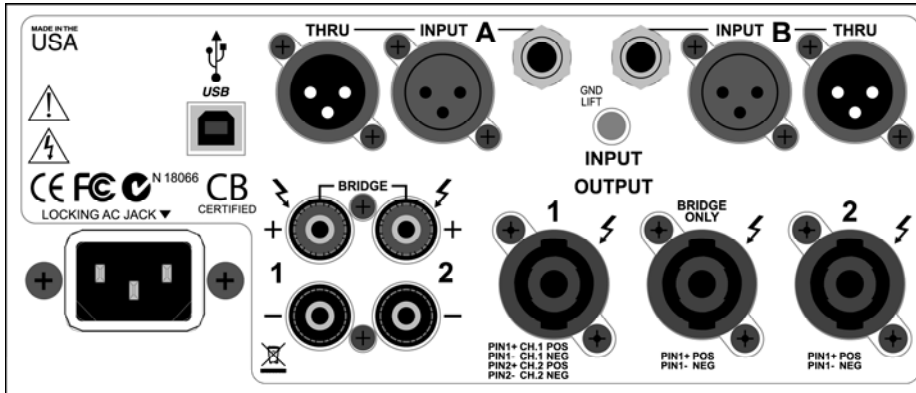
2ch. amp
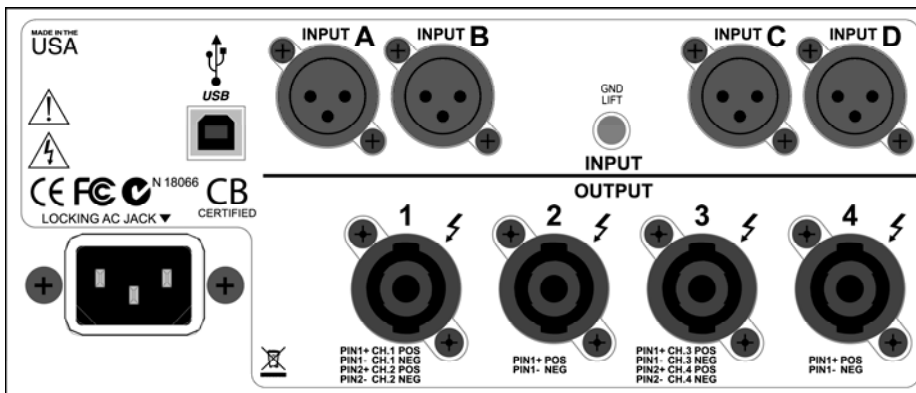
4ch. Amp

AC POWER
Your amp will work at 50 or 60Hz with specific 100VAC, 120VAC, or 240VAC models.
Be sure to check your amp model and power source before plugging into a grounded
(3 prong) outlet. The standard IEC inlet accepts universal grounded AC cords.
Firmly push the AC cord all the way into the receptacle or the amp may be intermittent.
The receptacle will work with V-lock™ locking cords to prevent accidental unplugging.
*WARNING: Never defeat the grounded connection or electrocution may result!
*NOTE: Each amp requires a dedicated circuit breaker to achieve its full output.
Fuse: The fuse is located inside the main chassis near the AC inlet on the main PCB.
If the fuse fails the amp will usually require service. See specifications for fuse values.

INPUT: A, B, (C, D): XLR input connectors for audio signals
Check DSP settings if not working as expected.
Two channel amps include 1/4"(TRS) inputs and XLR THRU outputs in parallel.
GND LIFT switch: Lifts the input connector grounds to solve ground loop issues.

OUTPUT: 1, 2, (3, 4): Speaker connections
Check the BRIDGE LED and DSP output settings for BRIDGE and ROUTING before
connecting to avoid malfunction or speaker damage.
Twist-Lock jacks accept 2-Pin or 4-pin Speakon™ compatible connectors.
Output 1 (or 3) allows Bi-Amping speakers through a single 4 conductor cable.
Binding Posts (on 2-ch.amps) allow bare wire connections up to 7ga. or "banana" plugs.
In **BRIDGE** mode use one of the following: the **BRIDGE ONLY** twist-lock output, the two
RED binding posts, or pins **1+** and **2+** on twist-lock **OUTPUT 1** (or **3**).
*Warning: Making additional connections to bridged amp outputs may misload the amp.

USB: Connect to PC/MAC to use Xdrive™ control software or to update DSP firmware.

4. FRONT PANEL CONTROLS

2 ch. amp

4ch. amp
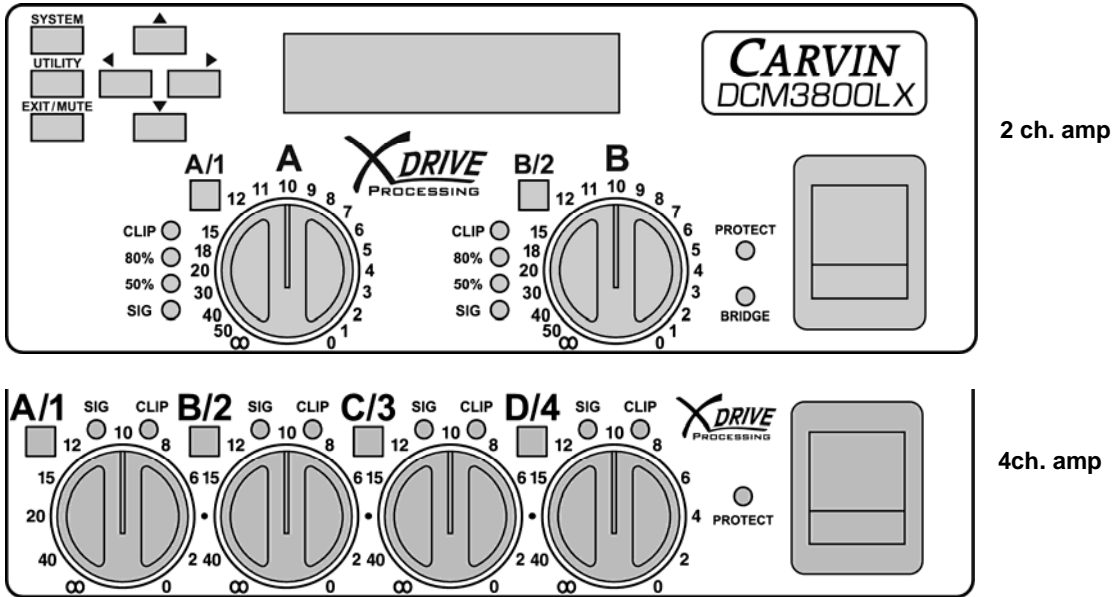
VOLUME ATTENUATOR CONTROLS: A, B (C, D)
Adjusts the channel INPUT levels. For bridge mode use **A** (or **C**).
Set to "**0**" (maximum) to match the input sensitivity DSP setting in the UTILITY menu.
DSP settings such as EQs, GAIN and LIMITER can affect output volume if not set to "0".

SYSTEM and **UTILITY** buttons:
Enter to SYSTEM or UTILITY menus. Escape the menus with **EXIT/MUTE**.

EXIT/MUTE button: Dual purpose, exit menus or mute amp outputs.
To MUTE, press **EXIT/MUTE**, then press the channel select **A/1** or **B/2 (C/3, D/4)**.
The display will indicate ON or MUTE (MT) for each amp OUTPUT.
Press **EXIT/MUTE** again to exit this mode.
*Note: If TURN ON MUTE is ON all outputs will be muted at POWER ON.
*Note: If SECURITY LOCKOUT is ON the TURN ON MUTE will be bypassed.

◄**(Left)**, ►**(Right)**:
Selects which parameter to change or move to the next or previous screen.

▲ (**Up**), ▼ (**Down**):
Adjusts parameter values.

SIG and **CLIP** LED's (amp OUTPUT signal indicators):
The **SIG** LED indicates a signal is being sent to the amp OUTPUT **1, 2 (3, 4)**.
The green **50%** and yellow **80%** LED's indicate amplifier power usage.
The **CLIP** LED's indicates the amp OUTPUT **1, 2 (3, 4)** has reached its maximum.

A/1, B/2 (C/3, D/4) Channel select buttons:
Press to adjust settings for each channel with **Up/Down** and **Left/Right**.
XLR inputs are **A, B (C, D)**, the amplifier outputs are **1, 2 (3, 4)**.

PROTECT LED: Indicates a protection circuit has engaged to protect the amp or
speakers. Check all connections and reset the amp with the power switch.

BRIDGE LED, 2ch. amps only: (for DCM**2004**Lx BRIDGE see SYSTEM menu settings)
Indicates the two amps are combined for one output. Use BRIDGE outs only.

4.A SYSTEM MENU
Press the **SYSTEM** button to open the SYSTEM menu.
Use the **Left/Right** buttons to move through the menu pages.
Press the **SYSTEM** button again to edit the setting with **Up/Down**.
Press **EXIT** to return to the channel screen.

4.A.1 QUICK SETUP
QUICK SETUP mode will allow you to quickly configure a full system, without
having to set routing and crossover parameters from each Output screen.

(a.) Press **SYSTEM, Right** for "**Quick Setup**", then **SYSTEM**.
(b.) Use **Up/Down** to select one of the SYSTEM TYPE configurations below.
(c.) Press **SYSTEM**.
(d.) Use **Up/Down** to set the crossover frequency**.**
   ex.: Hi – Low Freq: 2.30kHz
(e.) Press **SYSTEM** to exit the QUICK SETUP mode.

Note: The default Crossover Filter Type: Linkwitz-Riley 24dB/Octave can be
changed in the Output Settings.

DCM2000Lx, DCM3800Lx:

Mono2Way: Mono 2-way (Bi-amp)
   Input: **A**
   Crossover: Low/High
   Outputs: **1**:Low(A), **2**:High(A)

DCM2004Lx:

Str2Way: Stereo 2-Way (Two pairs of Bi-amp)
   Inputs: **A** and **B**
   Crossover: Low/High
   Outputs: **1**:Low(A), **2**:High(A)**,** **3**:Low(B), **4**:High(B)

Mono3Way: Mono 3-Way (Tri-amp)
   Input: **A**
   Crossovers: High/Mid, Mid/Low
   Outputs: **1**:Low(A), **2**:Mid(A), **3**:High(A)

Mono4Way: Mono 4-Way (hi / mid / low / sub)
   Input: **A**
   Crossovers: High/Mid, Mid/Low and Low/Sub
   Outputs: **1**:Sub(A), **2**:Low(A), **3**:Mid(A), **4**:High(A)

3WbrgSub: 3-Way Bridge Sub (Tri-amp with amps 1&2 bridged for Sub)
   Input: **A**
   Crossovers: High/Low, Low/Sub
   Outputs: **1/2 BRIDGE**: Sub(A), **3**:Low(A), **4**:High(A)

St2BrSub: Stereo 2 way Bridged Sub (L/R + amps 1&2 bridged for Sub)
   Inputs: **A** and **B**
   Crossovers: High/Sub
   Outputs: **1/2 BRIDGE**: Sub(A+B), **3**:High(A), **4**:High(B)

4.A.2 FLAT CHANNEL

This will set the parameters for an INPUT or OUTPUT channel to the "0" or Flat setting and all crossovers will be set wide open at 20Hz to 20kHz.
(a.) Press **SYSTEM**, **Right (2x)** for "**Flatten Channel**" then **SYSTEM**.
(b.) Use **Up/Down** to select the channel to flatten.
(c.) Press **SYSTEM** to continue and reset to flat (or **EXIT** to cancel) .

4.A.3 COPY CHANNEL

To copy channel settings to another Input or Output, use COPY CHANNEL.
(a.) Press **SYSTEM**, **Right (3x)** for "**Copy Channel**", then **SYSTEM**.
(b.) Use **Up/Down** to select the channel to copy **from**.
(c.) Press **SYSTEM**.
(d.) Use **Up/Down** to select a channel location to be pasted **into**.
(e.) Press **SYSTEM** again to finish or **EXIT** to end.

4.A.4 BRIDGING CHANNELS

CHANNEL BRIDGING combines two amps for more power to a single output. When CHANNEL BRIDGING connect the speaker(s) to the **BRIDGE OUTPUTs** on the DCM**2004**Lx use **OUTPUT 1** (pins **1+**, **2+**) or **OUTPUT 3** (pins **1+**, **2+**).
*Bridged minimum impedance: DCM**2004**Lx = **8 ohms**.
                                       DCM**2000**Lx and DCM**3800**Lx = **4 ohms**.
(a.) Press **SYSTEM**, **Right (4x)** for "**Channel Bridging**" then **SYSTEM**.
(b.) Use **Up/Down** to turn Bridging ON or OFF.
(b.2) On the 4 channel DCM**2004**Lx select which amps to bridge (**1-2**, or **3-4**) with **Left/Right**.
(c.) Press **SYSTEM** again to finish or **EXIT** to end.

4.A.5 SPEAKER PRESET (LOAD from memory)

You can recall speaker presets optimized for specific **CARVIN** loudspeakers and load them to OUTPUT channels.
The presets contain optimized settings for crossover frequencies, EQ, Delay (alignment), and Threshold (Limiter) which are tuned for the specific speaker elements in the speaker cabinet. These presets can also be used as starting points for similar speakers in other systems.
If you have already done a Quick Setup, loading speaker presets will over-write the OUTPUT settings.
(a.) Press **SYSTEM**, **Right (5x)** for "**Preset Speaker**" then **SYSTEM**.
(b.) Use **Up/Down** to choose a preset from the list.
(c.) Press **SYSTEM** to enter.
(d.) Use **Up/Down** to choose a "**SAVE:**" to channel **1** or **2**, (**1** thru **4** on the DCM**2004**Lx).
(e.) Press **SYSTEM** to enter.
(f.) Repeat steps (b.) – (e.) to load remaining outputs (or **EXIT**).
Example: To set up for a CARVIN **TRx115** cabinet:
Choose "**TRx115Lo**" and **Save to Channel** "**1**" (Low freq. Output),
then choose "**TRx115Hi**" and **Save to Channel** "**2**" (Hi freq. Output).
The crossover and other settings will now be set correctly for a **TRx115** cabinet, (Note: set the switch on the speaker's jack plate to **BI-AMP**).

4.A.6 SYSTEM NAME EDIT
(a.) Press **SYSTEM**, **Right (6x)** for "**SysName:**" then **SYSTEM**.
(b.) Use **Left/Right** to select a character.
(c.) Use **Up/Down** to edit the character.
(d.) Press **SYSTEM** or **EXIT** to save.

4.A.7 SAVE SYSTEM
SAVE SYSTEM will save a complete setup into a memory location, including all Input/Output settings. You can save multiple systems and recall (load) them later.
(a.) Press **SYSTEM**, **Right (7x)** for "**Save System**", then **SYSTEM**.
(b.) Use **Up/Down** to select a memory location to overwrite: **SAVE:** "**#**".
(c.) Press **SYSTEM** to save (or **EXIT** to cancel).

4.A.8 LOAD SYSTEM
LOAD SYSTEM will recall a complete setup from a memory location, including all Input and Output settings.
(a.) Press **SYSTEM**, **Right (8x)** for "**Load System**", then **SYSTEM**.
(b.) Use **Up/Down** to select the **LOAD:** "**#**" with **Up/Down**.
(c.) Press **SYSTEM** to load (or **EXIT** to cancel).

4.A.9 RESET SYSTEM TO FLAT
This will set the parameters for ALL INPUTS and OUTPUTS to the "0" or Flat setting and all crossovers will be set wide open 20Hz to 20kHz.
(a.) Press **SYSTEM**, **Right (9x)** for "**Reset to Flat**", then **SYSTEM**.
(b.) Press **UP** to continue and reset to flat (or **EXIT** to cancel).

4.B UTILITY MENU

Press the **UTILITY** button to open the UTILITY menu.
Use the **Left/Right** buttons to move through the menu.
Press **EXIT** to return to the channel screen.

4.B.1 DELAY UNITS
(a.) Press **UTILITY** for "**Pg 1**".
(b.) Use **Up/Down** to display delay times in **Seconds**, **Feet** or **Meters**.
(c.) Press **Right** for Page 2 or **EXIT** to escape.

4.B.2 DELAY TIME BANK
This screen displays how much memory is remaining for use.
The DCM-Lx starts with a total of 120mS of delay memory. As you assign
more delay to channels, the remaining available memory time decreases.
(a.) Press **UTILITY** then **Right** for "**Pg 2**". The available memory will display.
(b.) Press **Right** for Page 3 or **EXIT** to escape.

4.B.3 INPUT SENSITIVITY
The SENSITIVITY setting adjusts the input level required to reach maximum
output when the front panel level controls are set to the maximum "**0**" setting.
(a.) Press **UTILITY** then **Right (2x)** for "**Pg 3**".
(b.) Use **Up/Down** to set the input sensitivity: **0.7**, **1.0**, **1.2**, **1.4**, or **2.0** Vrms.
The factory set default is **1.4Vrms**.
(c.) Press **Right** for Page 4 or **EXIT** to escape.

4.B.4 TURN ON MUTE
(a.) Press **UTILITY** then **Right (3x)** for "**Pg 4**".
(b.) Using **Up/Down:**
Choose **ON** to *mute* all outputs when the DCM-Lx is powered on.
Choose **OFF** to leave outputs active at startup.
(c.) Press **Right** for Page 5 or **EXIT** to escape.
*Note: TURN ON MUTE will be bypassed if SECURITY LOCKOUT is ON.

4.B.5 SECURITY LOCKOUT – PASSWORD
(a.) Press **UTILITY** then **Right (4x)** for "**Pg 5**".
(b.) Use **Up/Down** to change the setting:
Select **ON** to prevent any changes to the DCM-Lx settings. Settings will
still be viewable, but no changes can be made.
Select **OFF** to allow changes to the DCM-Lx settings.
(c.) Enter the 4-digit password using the Channel **(A/1, B/2, C/3, D/4)** buttons.
(d.) Press **Right** for Page 6 or **EXIT** to escape.
*Note: The factory set default password is **1122**.

4.B.6 PASSWORD CHANGE
To change the 4-DIGIT PASSWORD, you must first enter the old password.
(a.) Press **UTILITY** then **Right (5x)** for "**Pg 6**".
(b.) Use the Channel **(A/1, B/2, C/3, D/4)** buttons to enter the **old** password.
(c.) Press **UTILITY**.
(d.) Use the Channel **(A/1, B/2, C/3, D/4)** buttons to enter the **new** password.

The password will be saved on the 4th button press.
(e.) Press **Right** for Page 7 or **EXIT** to escape.
*Note: The factory set default password is **1122**.

4.B.7 UNIT ID

Multiple DCM-Lx's and other CARVIN X-Drive™ products such as the XD360, EQ230 and EQ430 can be controlled with the **Xdrive™** software through USB from a single computer. When doing this, set the UNIT ID for each device to a different number.
(a.) Press **UTILITY** then **Right (6x)** for "**Pg 7**".
(b.) Press **Up/Down** to set the UNIT ID from 1-16.
(c.) Press **Right** for Page 8 or **EXIT** to escape.
Note: The maximum cable length for a USB connection (without an active extension) is 16**.**4ft (5M).

4.B.8 FIRMWARE VERSION

This screen displays the firmware version. Future upgrades and improvements can be uploaded from a computer with USB to the DCM-Lx hardware memory.
(a.) Press **UTILITY** then **Right (7x)** for "**Pg 8**".
(b.) Press **Left** to go back to Page 7 or **EXIT** to escape.

4.C EXIT/MUTE BUTTON

The EXIT/MUTE button is used to exit from the SYSTEM or UTILITY menus, or to toggle between MUTE and CHANNEL control functions.

(a.) Press the **MUTE** button to see "**Press CH to Mute**".
(b.) Press a CHANNEL button, **(A/1, B/2, C/3, D/4)** to choose **ON** or **Mute**.
(c.) Press the **MUTE** button again to switch from MUTE to CHANNEL control.

```
Press CH to Mute
CH1 ON   CH2Mute
```
DCM2000Lx
DCM3800Lx
Mute screen
(ch.2 muted)

```
Press CH to Mute
1ON 2ON 3ON  4Mt
```
DCM2004Lx
Mute screen
(ch.4 muted)

MAIN SCREEN: (Channel control) get to any menu from this screen.

```
System: any_name
CH1 ON   CH2 ON
```

4.D CHANNEL SETTINGS

Pressing a CHANNEL button (**A/1, B/2, C/3, D/4**) will cycle through 3 display modes:
- MAIN SCREEN: displays System name and Mute status.
- INPUT: Displays a Channel letter (**A, B, C,** or **D**) and graphic EQ.
- OUTPUT: Displays a Channel number (**1, 2, 3** or **4**) and parameter(s).

   In OUTPUT mode, use the **Left/Right** buttons to move through screens or to select a parameter to edit.
   Use **Up/Down** to change the value.
   Changes are saved when leaving the screen.
   Pressing a different channel button will allow you to edit the same parameter in the next channel without having to go through screens.
   If you have not changed the OUTPUT screen selection since power ON the first OUTPUT screen will be GAIN.
   When you leave OUTPUT mode, the same OUTPUT screen will appear first when returning to the OUTPUT mode.

4.D.1 (INPUT) GRAPHIC EQ

The Graphic EQ affects the incoming signal from the INPUT A, B, (C or D).
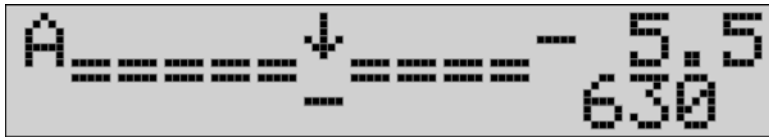
Example: Input A,
-5.5dB @ 630Hz

Example: Input B
+12dB @ 16.0kHz

(a.) Press (**A/1, B/2, C/3** or **D/4**) until the screen above is shown.
(b.) Use **Left** or **Right** to select one of the 30 frequency bands.
(c.) Use **Up/Down** to adjust the level of the selected frequency.
The range is **+/-12.0db**, in **0.5dB** steps.
The arrow indicates the band being adjusted with the horizontal lines showing approximate levels for each band.
A dual line indicates a 0db flat setting.
*Note that the arrow is always in the center for frequencies 80-8k and only moves left or right near the ends of the spectrum.

4.D.2 (OUTPUT) GAIN

The GAIN can be set for each output to balance levels between speakers.

Example: Output 1 named "Mono Low"
Gain set to 0dB

(a.) Press (**A/1, B/2, C/3** or **D/4**) to enter OUTPUT mode (CH, Number).
(b.) Press **Left** or **Right** until the screen above is shown.
(c.) Use **Up/Down** to adjust the **Gain** (volume) of the selected OUTPUT.
The range is **+12.0db** (max.) to **-68.0db** (min.) in **0.5dB** steps.

4.D.3 (OUTPUT) SOURCE
The SOURCE setting will determine which Inputs are routed to which Outputs.

```
CHAN 1    Mono Low
SOURCE:   A
```

(a.) Press (**A/1, B/2, C/3** or **D/4**) to enter OUTPUT mode (CH, Number).
(b.) Press **Left** or **Right** until the screen above is shown.
(c.) Use **Up/Down** to choose **A**, **B**, or **A+B**, (or **C**, **D**, or **C+D** on the **DCM2004Lx**).
You can use the QUICK SETUP feature in the SYSTEM menu to easily set up the outputs as a full system.

4.D.4 (OUTPUT) PHASE

```
CHAN 1    Mono Low
PHASE:    IN
```

(a.) Press (**A/1, B/2, C/3** or **D/4**) to enter OUTPUT mode (CH, Number).
(b.) Press **Left** or **Right** until the screen above is shown.
(c.) Use **Up/Down** to choose **IN** or **OUT** of phase. (0 or 180 degrees).
   This can be used to adjust the phase of individual components in a multi-component system (2-way, 3-way, 4-way systems) or to correct a speaker wired out of phase. Some feedback problems can be solved with PHASE.

4.D.5 (OUTPUT) LOW/HIGH PASS FILTERS: Crossover
The LPF and HPF determine crossover points. Only frequencies below the LPF and above the HPF are sent to the selected OUTPUT.

```
CHANNEL 1      LPF
1.00kHz Linkwz24
```
Example: Output 1 LPF Frequency = 1.00 kHz Type = Linkwitz-Riley, 24dB/oct.

```
CHANNEL 1      HPF
40.0 Hz Linkwz48
```
Example: Output 1 HPF Frequency = 40.0 Hz Type = Linkwitz-Riley, 48dB/oct.

The resulting frequency range of **OUTPUT 1** is 40Hz-1kHz.

(a.) Press (**A/1, B/2, C/3** or **D/4**) to enter OUTPUT mode (CH, Number).
(b.) Press **Left** or **Right** until one of the screens above is shown.
(c.) Use **Left/Right** to choose **LPF Freq.** and **LPF Type** then on the next screen **HPF Freq.** and **HPF Type**
(d.) Use **Up/Down** to change the parameter.
   LPF: Set the Low Pass Filter frequency (Hi Cut) and Filter type.
   HPF: Set the High Pass Filter frequency (Low Cut) and Filter type.
Filter types:
   OFF: no cutoff
   BUTTER 6 : Butterworth 6db/octave slope (1 [st] order)

BUTTER 12 : Butterworth 12db/octave slope (2nd order)
BUTTER 18 : Butterworth 18db/octave slope (3rd order)
BUTTER 24 : Butterworth 24db/octave slope (4th order)
BUTTER 48 : Butterworth 48db/octave slope (8th order)
BESSEL 12, or **24**: Bessel (2nd order) or (4th order)
LINKWZ 12, 24, or **48**: Linkwitz-Riley (2nd order), (4th order), (8th order)

4.D.6 (OUTPUT) LIMITER

The Limiter is used to protect amplifiers and speakers by controlling peaks in the amplifier output which could otherwise cause distortion or clipping.
Thresh: The Threshold level has a range from **0dB** to **-20dB**.
Output levels less than the Threshold setting will not be affected.

```
CHAN 1      Limiter
THRESH:       -3dB
```

Example: Output 1
Threshold = -3dB

(a.) Press (**A/1, B/2, C/3** or **D/4**) to enter OUTPUT mode (CH, Number).
(b.) Press **Left** or **Right** until the screen above is shown.
(c.) Use **Up/Down** to adjust the **Threshold** for the limiter.

4.D.7 (OUTPUT) DELAY

The **Delay** time can be added to an OUTPUT to time-align drivers or to account for distance between other enclosures.

```
CHANNEL 1   Delay
mS:  15    uS:120
```

(a.) Press (**A/1, B/2, C/3** or **D/4**) to enter OUTPUT mode (CH, Number).
(b.) Press **Left** or **Right** until the screen above is shown.
(c.) Use **Left/Right** to select coarse (ex. mS) or fine (ex. uS) increments.
(d.) Use **Up/Down** to adjust the delay time (in Seconds, Feet or Meters).
(change units in the **UTILITY** menu)
The total amount of delay available for the DCM-Lx is 120 milliseconds (120ft./36.5M). Each time a delay is added, it deletes it from the total time available for the system. For example, a Stereo setup may have up to a maximum of 63mS for each of the 2 inputs. (see **4.B.2** for memory available)

- Continued next page with section **4.D.8** PARAMETRIC EQ's -

4.D.8 (OUTPUT) PARAMETRIC EQs (PEQ 1-4)
The four bands of Parametric EQ on each Output are used to EQ the amp channels independently.

```
CH1    PEQ4  0.30BW
-4.0 dB    6.80kHz
```

Example: Output 1,
Parametric EQ #4,
BW=1/3oct.
-4dB @ 6.8kHz

(a.) Press (**A/1, B/2, C/3** or **D/4**) to enter OUTPUT mode (CH, Number).
(b.) Press **Left** or **Right** until a screen like the one above is shown.
(c.) Use **Left** or **Right** to select the BW, GAIN, and FREQUECY for the PEQ.
(d.) Use **Up/Down** to adjust the parameter.
(e.) Press **Left** or **Right** for other PEQ1, PEQ2, PEQ3 or PEQ4 screens.

Bandwidth:
The upper right cursor position sets the **BW** (BandWidth) of the PEQ.
The **BW** is adjustable from a narrow **0.16** octave to a wide **2.00** octaves.
0.16 octave has a narrow slope for picking out specific frequencies.
0.30 octave is about equal to one fader on a normal 30 band EQ, or 1/3 octave.
2.00 octaves has a bandwidth of 6 faders with a broad slope.

Gain:
The lower left cursor position sets the boost or cut from **+12.0dB** to **-12.0dB**.

Frequency:
The lower right cursor position sets the frequency in Hz from **20** to **20k**.

Press **Right** to access the **PEQ2, PEQ3, PEQ4** settings.

PARAMETRIC EQ SETTINGS:
Figure 1 is a +12dB boost, 1kHz filter of varying bandwidths in octaves:
0.16oct.(1), 0.30oct.(2), 0.60oct.(3), 1.00oct.(4) and 2.00oct.(5).

fig.1
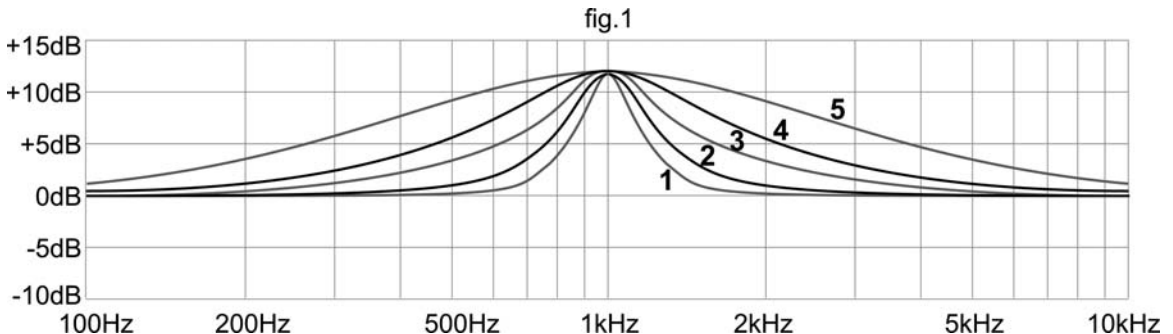
4.D.9 (OUTPUT) CHANNEL NAME

```
CHAN 1
NAME:  any_name
```

      (a.) Press (**A/1, B/2, C/3** or **D/4**) to enter OUTPUT mode (CH, Number).
      (b.) Press **Left** or **Right** until the screen above is shown.
      (c.) Use **Left** or **Right** to select a character to change.
      (d.) Press **Up/Down** to change the character.
      (e.) Use **LEFT**/**RIGHT** to choose the other characters to edit.
Moving the cursor all the way to the Left or Right will exit the screen.

5. COMPUTER SETUP

The DCM-Lx has a USB port allowing use with Carvin's **Xdrive™** software.

5.A SOFTWARE

5.A.1 MINIMUM REQUIREMENTS
Windows: XP or later.
Mac: OS 10.6 or later.

5.A.2 INSTALLATION
Download the software from: www.carvin.com/xdrive

To install the **Xdrive™** software for the DCM-Lx:

1. Unzip the files to a directory on your Hard Drive. There is 1 file:
"Setup.exe"

2. Run the Setup.exe file to install the **Xdrive™** Serial Control software on
your computer.

3. The software will be installed to the **c:\Program Files\Carvin Xdrive**
directory.
It is recommended not to change the install directory.

4. You will be asked if you would like a Desktop shortcut icon created.
It is recommended to do this to allow easy access to the program.

5. The **Xdrive™** software is now ready to use by double-clicking the
Xdrive™ icon on your desktop. When linking to the DCM-Lx hardware, the
device should be connected via the USB cable and powered on before the
software is used.

5.B USB CONNECTION

Turn on the computer and wait to see the desktop.
Turn on the DCM-Lx amp(s).
Connect the USB cable to both the computer and the DCM-Lx.
Run the **Xdrive™** software on the computer.

A picture of the connected Carvin **Xdrive™** compatible device(s) will appear, with device name, firmware version and USB ID number (under the "Online" tab).

Click on the blue button for the device name button (example: "**DCM2004Lx**").
The control window for that device will display on your computer screen.
The front panel of the amp will read "Unit is under Remote Control".
The device is now connected.

*To connect more devices or to connect after the software is running:
Select the "**Online**" tab at the top right of the screen.
Click on the blue "**SCAN**" button at the top right of the screen.

*To create and store settings without devices connected, select the "**Offline**" tab and select a device to configure from the list.

CONTROL WINDOW FOR DCM2004Lx:

6. COMPUTER CONTROL / GRAPHIC INTERFACE
6.A SYSTEM SETTINGS
(top section of screen)

6.A.1 SYSTEM LOAD/SAVE
Complete setups can be saved as a SYSTEM on the computer, and uploaded back in from the computer.
Be sure to save these files in a known location so they can be retrieved later.

6.A.2 SYSTEM NAME
Click in the **"Sys Name"** box to type a new name for the System preset.

6.A.3 SYNC TO SOFTWARE
Click on this button to transfer the computer screen settings to the DCM-Lx.
All changes made on the computer screen will change the DCM-Lx.

6.A.4 SYNC TO HARDWARE
Click on this button to display the settings from the DCM-Lx onto the computer screen. All changes made on the computer screen will change the DCM-Lx.

6.A.5 UPLOAD FIRMWARE
(Updating the DCM-Lx)
Future upgrades and improvements can be uploaded from the computer to the DCM-Lx hardware memory.
To perform a DCM-Lx firmware update:
Download new firmware to your computer from www.carvin.com/xdrive.
Save the file in a known location on your computer.
Click on the "UPLOAD FIRMWARE" button at the top right of the screen.
Navigate to the firmware file you saved on your computer and double click.
The firmware will be uploaded form the computer to the DCM-Lx.
This may take a few minutes.
When complete, the display will read "FIRMWRE UPDATED".

6.B INPUT SETTINGS
(top 1/3 of screen, after SYSTEM)
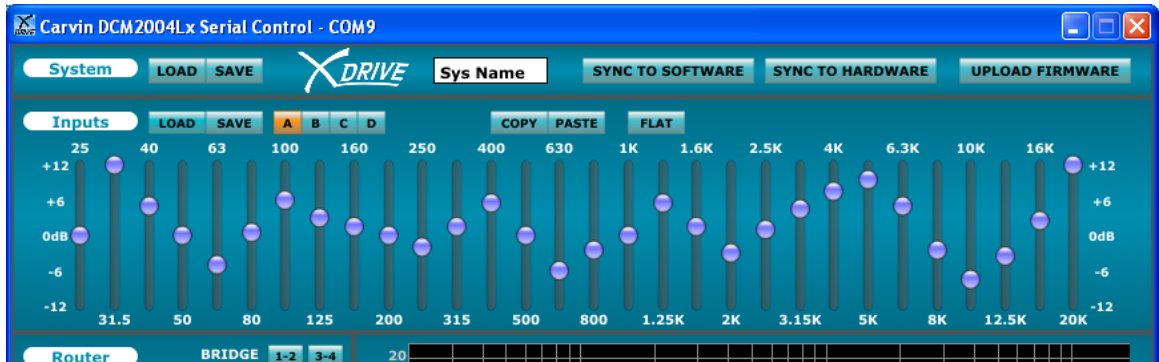
6.B.1 LOAD/SAVE
Load preset input settings or save them to your computer.

6.B.2 INPUT SELECT
A, B, (C, D) buttons select and display Graphic EQ settings for each Input.

6.B.3 COPY/PASTE
Copy output settings from one output to another.

6.B.4 RESET TO FLAT
Set all GEQ frequency bands to flat "0" for the selected Input.

6.B.5 GRAPHIC EQs
Hold and drag the Graphic EQ faders to boost or cut a frequency band.

6.C ROUTER (MATRIX)
(middle left screen)

6.C.1 BRIDGE CHANNELS
BRIDGE **1-2**, (**3-4**) button(s) combine amps 1 & 2 (or 3 & 4) for a single high
power output. Use the appropriate output jacks when bridging amps.
*Note: the minimum impedance for a BRIDGED output is
4 ohms for 2 channel amps, and **8 ohms** for the DCM2004Lx.

6.C.2 OUTPUT MUTES
Click the **MUTE** buttons to mute or un-mute each output.

6.C.3 ROUTING INPUT SOURCES TO OUTPUTS
Click the **A, B, (C, D)** buttons select the signal source(s) for each output.

6.C.4 OUTPUT NAME
Click in the **"Output 1"** (etc.) box to type a new name for each output.

6.D FREQUENCY CHART
(middle right screen)

6.D.1 OUTPUT DISPLAY BUTTONS 1, 2 (3, 4)
Displays the frequency response of each amp output as a different color.

6.D.2 ADJUSTING PEQs FROM THE FREQUENCY CHART
The Parametric EQs can be manipulated directly from the Frequency Chart.
Highlight the curve from the lower OUTPUT section with the blue OUTPUT
select 1, 2, (3, 4) buttons. (see **6.E.2**)
Click and drag a round node to adjust frequency and gain, then release.
Bandwidth (or "Q") is only adjustable in the bottom OUTPUT section, using
the PEQ BW sliders.

6.E OUTPUT SETTINGS
(bottom of screen)

6.E.1 LOAD/SAVE
Load preset output settings or save them to your computer.

6.E.2 OUTPUT CHANNEL SELECT
Buttons **1**,**2 (3,4)** : Select to display the settings for each output.
The output's curve will be highlighted if displayed on the Frequency Chart.

6.E.3 COPY/PASTE
Copy output settings from one output to another.

6.E.4 FLAT
Resets the Output GAIN to 0dB, PEQs flat, and HPF/LPF to 20-20kHz.

6.E.5 PHASE
Flip the phase 180 degrees. IN is normal, OUT is +180 deg.

6.E.6 LIMITER
Set the threshold for the Limiter (0db = min, -20dB = max).

6.E.7 DELAY
Set the delay time for the output. Right click to select units: mS, Ft, or M.

6.E.8 GAIN
Set output level from +12dB(full) to -68dB(off).
Set to 0dB to match the Input Sensitivity setting in UTILITY menu.

6.E.9 PARAMETRIC EQs 1-4
Each amp output has 4 bands of Parametric EQ.
Adjust the vertical sliders for:
GAIN: Boost or cut in dB
FREQ: Frequency in Hz
BW: Bandwidth or "Q" in octaves
The PEQs can also be adjusted in the Frequency Chart. (see **6.D.2**)

6.E.10 HIGH/LOW PASS FILTERS (Crossover)
Set each crossover frequency with the sliders. Select filter type and slope
(dB/oct.) from the list in the white box. Select OFF for no frequency cutoff.

7. MANUAL SETUPS

7.A 2-WAY (Biamp):
    (a.) Press **A/1** to enter OUTPUT mode.
    (b.) Press **Left** or **Right** until the "CHANNEL **1** … **LPF**" screen is displayed.
    (c.) Use **Left/Right** to choose **LPF Freq.**
    (d.) Use **Up/Down** to change the **LPF** to **2.30kHz** for **CH.1**
    (e.) Press **Right**.
    (f.) Press **Up** to change the **LPF Type** (ex.: **Butter12**).
    (g.) Press **B/2** channel 2
    (g.) Press **Right** for the "CHANNEL **2** … **HPF**" screen.
    (h.) Use **Up/Down** to change the **HPF** to **2.30kHz** for **CH.2**
    (i.) Press **Right**.
    (j.) Press **Up** to change the **LPF Type** (ex.: **Butter12**).
    (k.) Press **Left** or **Right** until the SOURCE screen is shown for **CH.2**.
    (l.) Use **Up/Down** to choose **A**. (for **CH.2**)

*Note: With "Quick Setup" in the SYSTEM menu (3.A.1) this setup can be done in only 4 steps.

SPEAKER CONNECTIONS:
    OUTPUT 1: LF, frequencies below 2.30kHz (Signal from INPUT A).
    OUTPUT 2: HF, frequencies above 2.30kHz (Signal from INPUT A).

_____

7.B Parallel Outputs:
    (a.) Press **A/1** to enter OUTPUT mode (CH, Number).
    (b.) Press **Left** or **Right** until the SOURCE screen is shown.
    (c.) Use **Up/Down** to choose **A**. (for **CH.1**)
    (d.) Press **B/2** for OUTPUT 2.
    (e.) Use **Up/Down** to choose **A**. (for **CH.2**)

CONNECTIONS:
    OUTPUT 1: Full range signal from INPUT A.
        OUTPUT 2: Full range signal from INPUT A.

8. LOUDSPEAKER SETTINGS CHART

#	Name	Gain	Phase	LPF Freq	LPF Type	HPF Freq	HPF Type	Limiter Threshold	Delay Large	Delay Small	PEQ1 BW	PEQ1 Freq	PEQ1 Gain	PEQ2 BW	PEQ2 Freq	PEQ2 Gain	PEQ3 BW	PEQ3 Freq	PEQ3 Gain	PEQ4 BW	PEQ4 Freq	PEQ4 Gain
1	TRx3210 Hi	-9.0	IN	20k	Off	1.5k	BUT48	0	0	0	0.30	2.5k	4									
2	TRx3210 Low	0.0	IN	1.5k	BUT48	80	L-R24	0	0	0												
3	Sub w TRx3210	0.0	IN	80	L-R24	31.5	BUT12	0	0	0												
4	TRx3903	0.0	IN	20k	Off	160	L-R48	0	0	0	1.00	12.5k	3									
5	Sub w TRx3903	0.0	IN	160	L-R48	29	BUT18	0	0	0												
6	TRx2115Full	0.0	IN		OFF	29	BUT18	0	0	0	0.30	1.5k	3	0.30	6.8k	2.5	0.60	108	2			
7	TRx2115Lo	0.0	IN		OFF	29	BUT18	0	0	6.16in	0.60	80	3									
8	TRx2115Hi	-6.0	IN		OFF	1.5k	L-R48	0	0	0	0.30	6.8k	4.5	0.60	15k	4						
9	TRx2153Full	0.0	IN		OFF	29	BUT18	0	0	0	0.16	1.35k	3	0.60	215	4	0.60	465	-3	0.16	8k	-1.5
10	TRx2153Lo	0.0	IN	345	L-R48	29	BUT18	0	0	6.16in	0.60	250	3									
11	TRx2153Hi	0.0	IN		OFF	345	L-R48	0	0	0												
12	TRx2215Full	0.0	IN		OFF	29	BUT18	0	0	0	0.60	920	3	0.30	270	4	0.30	465	-3	0.60	10.8k	4
13	TRx2215Lo	0.0	IN		OFF	29	BUT18	0	0	6.16in.	0.60	920	10									
14	TRx2215Hi	-3.0	IN		OFF	1.87k	BUT24	0	0	0	0.30	2.15k	-4	0.60	15k	2						
15	TRx12NFL	0.0	IN	20k	OFF	50	BUT48	0	0	0	1	800	-6	0.6	92	4	0.16	1.6k	8	0.6	6.8k	3
16	TRx12NHi	-8.0	IN	20k	OFF	2.00k	BUT18	0	0	0	1.00	2.90k	-7.0									
17	TRx12NLo	0.0	IN	2.00k	BUT24	50	BUT48	0	0	0	0.60	92	6.0	1.00	430	-6.0	0.30	1.35k	2	0.16	345	3
18	SCx1112Full	0.0	IN		OFF	29	BUT18	0	0	0	0.30	315	3	0.16	5k	-2.5	0.16	7.5k	-3	0.30	1.35k	5
19	SCx1112Lo	0.0	IN	1.87k	BUT18	29	BUT18	0	0	0												
20	SCx1112Hi	-6.0	IN		OFF	1.87k	BUT18	0	0	0	1.00	4k	-6									
21	SCx1115Full	0.0	IN		OFF	29	BUT18	0	0	0	0.30	630	-3	0.30	4.65k	-2.5						
22	SCx1115Lo	0.0	IN	1.73k	BUT18	29	BUT18	0	0	0												
23	SCx1115Hi	-3.0	IN		OFF	1.87k	BUT18	0	0	0	0.60	4k	-7.5									
24	SCx1253Full	0.0	IN		OFF	29	BUT18	0	0	0	1.00	430	6	0.16	250	-6	0.30	12.5k	3			
25	SCx1253Lo	0.0	IN	315	BUT48	29	BUT18	0	0	0	0.30	250	-5									
26	SCx1253Hi	0.0	IN		OFF	250	BUT48	0	0	0	0.60	500	4	0.16	1.08k	4						
27	LS1523Hi	0.0	IN	0	Off	430	BUT18	0	0	0												
28	LS1523Lo	0.0	IN	430	BUT18	50	BUT24	0	0	0												
29	LS1523Sb	0.0	IN	92	BUT24	29	BUT48	0	0	0												
30	LS2153Hi	0.0	IN	0	OFF	50	BUT24	0	0	0	1.50	3.45k	-4.5									
31	LS2153Lo	0.0	IN	540	BUT48	50	BUT24	0	0	0												
32	LS2153Sb	0.0	IN	100	BUT12	29	BUT48	0	0	0												
33	LS1801Sb	0.0	IN	125	BUT24	29	BUT48	0	0	0												
34	TRx115Hi	-5.5	IN	0	OFF	3.15k	BUT18	0	0	0												
35	TRx115Lo	0.0	IN	2.15k	L-R48	40	BUT18	0	0	0	1.00	1.35k	3.0									
36	TRx115Sb	0.0	IN	125	BUT24	29	BUT48	0	0	0												
37	TRx215Hi	-3.0	IN	0	OFF	1.35k	L-R48	0	0	0	2.00	2.70k	-5.5									
38	TRx215Md	0.0	IN	2.00k	BUT24	0	OFF	0	0	0												
39	TRx215Lo	0.0	IN	187	BUT6	0	OFF	0	0	0												
40	TRx215Sb	0.0	IN	108	BUT12	29	BUT48	0	0	0												
41	TRx153Hi	-6.0	IN	0	OFF	3.15k	L-R24	-3	0	0	1.50	8.00k	3.0									
42	TRx153Md	-4.0	IN	3.15k	L-R24	465	L-R24	0	0	0	0.60	2.00k	6.0									
43	TRx153Lo	0.0	IN	465	L-R24	40	BUT18	0	0	0												
44	TRx153Sb	0.0	IN	125	BUT18	29	BUT48	0	0	0												
45	TRx118N	0.0	IN	125	BUT24	29	BUT48	0	0	0												
46	TL2100Hi	0.0	IN	20k	OFF	2.5k	L-R24	0	0	0	0.30	3.45k	-3	1.00	10k	3	0.30	15k	-4			
47	TL2100Lo	-3.0	IN	2.5k	L-R24	63	BUT12	0	0	0	0.30	1.17k	3	1.00	400	-8						

9. SPECIFICATIONS

INPUTS:
XLR IN: 20kΩ balanced, ground lift switch
2ch. amps add 1/4" TRS IN and XLR THRU in parallel
Maximum Input: +10dBu

OUTPUTS:
Output Connectors: 4-pin Twist-Lock (and binding posts on 2ch. models)
Frequency Response: 20Hz-20kHz +/-1.5dB
THD: <0.1% @50%, <0.2%@90%, <1%@ rated power (1kHz, EIA)

OUTPUT POWER:		DCM2000Lx	DCM2004Lx	DCM3800Lx
2 channels:	8 Ω	350w	300w	700w
	4 Ω	550w	500w	1150w
	2 Ω	1000w	-	1800w
Bridged:	8 Ω	1100w	1000w	2300w
	4 Ω	2000w	-	3800w

DIGITAL SIGNAL PROCESSING:
Multi DSP 48kHz/24 bit
30-band Graphic EQ (each input): 20Hz to 20kHz, +/-12dB in 0.5dB steps
Gain: +12dB to -68dB in 0.5dB steps
Source Routing with Amp Bridging
Phase: 0 or -180 degrees (in or out)
High pass and Low pass (Crossover) Filters:
Butterworth: 6, 12, 18, 24, 48 dB/oct.
Bessel: 12, 24 dB/oct.
Linkwitz-Riley: 12, 24, 48 dB/oct.
Limiter: 0dB to -20dB threshold, hard limiting in 1dB steps
Delay: 0-120mS in 21uS steps (0-120ft in 0.28in steps, or 0-40 meters in 7mm steps)
4-band Parametric EQ's (per output): +/- 12dB in 0.5dB steps, 0.16 to 2.0 octaves(Q)
Global System settings:
Input sensitivity: 0.7, 1.0, 1.2, 1.4 or 2.0 Vrms
Turn On Mute: On/Off
Security Lockout with user-definable Password sequence
System Preset memory storage locations: 16
USB: **"**type B" jack, compatible with USB 1.1 or higher,
for internal firmware updates, or remote **Xdrive**™ software control

General:
Dimensions: 19"W x 3.5"H x 11"D (483mm x 90mm x 280mm)
Weight: DCM2000Lx, DCM2004Lx: 10 lbs (4.5 kg)   DCM3800Lx: 15 lbs (6.8 kg);
Power: 100, 120 or 240 VAC models, 50/60Hz standard IEC inlet (V-lock™ compatible)
Internal fuses: SLOW BLOW
DCM2000Lx: 100V or 120V: 15A,   240V: 10A
DCM2004Lx: 100V or 120V: 15A,   240V: 10A
DCM3800Lx: 100V or 120V: 25A,   240V: 15A

WARNING: This product produces high sound pressure levels that could damage hearing.
Use with caution.

10. MENU NAVIGATION CHART

CARVIN DCM-LX XDRIVE OPERATION MENU REFERENCE SHEET
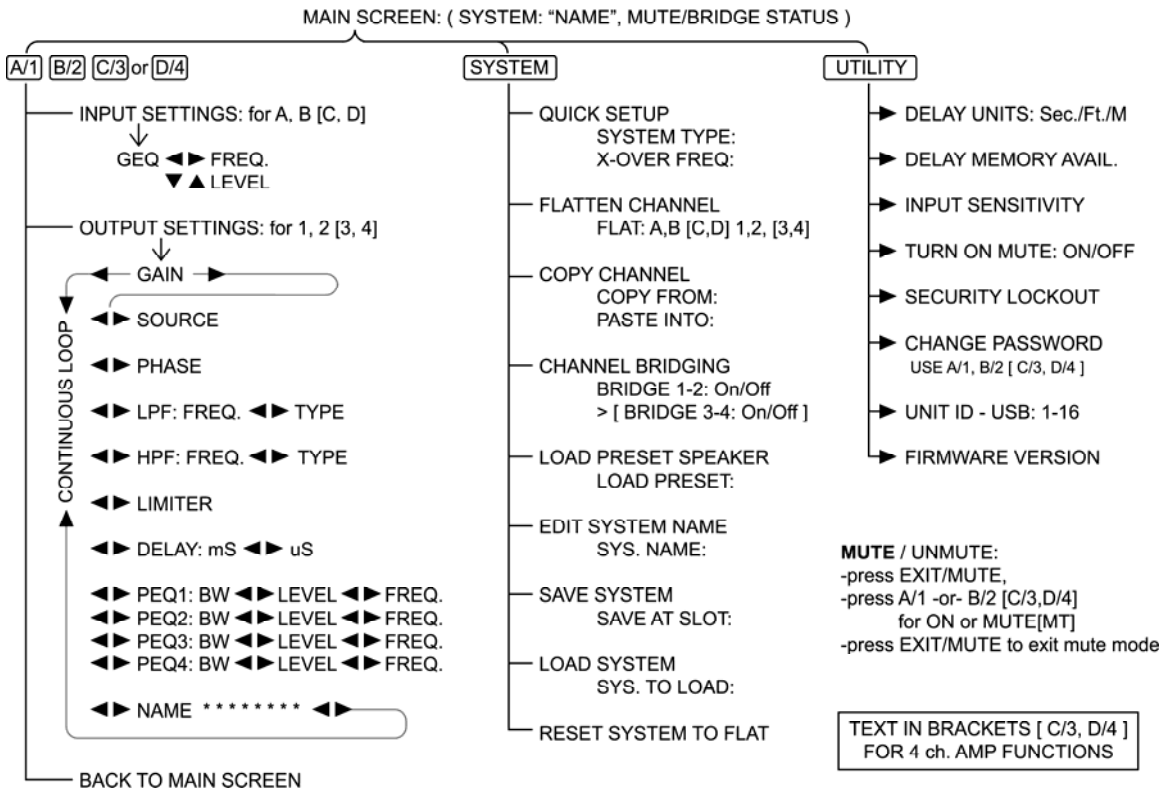
11. BLOCK DIAGRAM

CARVIN DCM-LX XDRIVE SIGNAL ROUTING BLOCK DIAGRAM