

CX-A850 Amplifier

Installation & User Guide v 4.0

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CX-A850 Amplifier

Installation and operation manual

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1 Safety Notes

- Do not expose the unit to water or moisture
- Do not expose the unit to naked flames.
- Do not block or restrict any air vent
- Do not operate the unit in ambient temperatures above 45°C
- Do not touch any part or terminal carrying the hazardous live symbol  while power is supplied to the unit.
- Do not perform any internal adjustments unless you are qualified to do so and fully understand the hazards associated with mains operated equipment.
- The unit has no user serviceable parts. Refer any servicing to qualified service personnel.
- If the moulded plug is cut off the lead for any reason, the discarded plug is a potential hazard and should be disposed of in a responsible manner.

For more detailed information refer to the rear of the manual.

2 General

The CX-A850 is an eight-channel power amplifier with a typical output of 50 watts per channel into a 4Ω load. The unit features extremely low distortion and low noise together with a high slew rate. Full circuit protection is provided and the load is disconnected if the heat sink overheats or any DC is detected at the output. A five-second switch-on delay operates to avoid any switching thumps or other extraneous signals reaching the speaker system. The CX-A850 also has Dynamic Clipping Protection (DCP) that will automatically reduce the signal level when the amplifier is driven into clipping thus limiting any clipping distortion to a low level.

All eight input amplifiers are balanced and have 3-pin plug in screw terminal type input connectors with adjacent level controls, all mounted on the rear panel. Input signal routing switches are provided and allow the unit to operate in many configurations whilst retaining simple input connections.

3 Installation

The CX-A850 is suitable for mounting in a standard 19" equipment rack and occupies two units of rack space. Sufficient ventilation must be provided for the unit. The amplifier draws cool air through the front panel and exhausts through the side panels and care must be taken not to obstruct the airflow otherwise the unit may intermittently turn off due to the built-in thermal protection. The unit is 320mm deep but a depth of 400mm should be allowed to clear the connectors.

4 Input Facilities

All eight inputs are balanced and use 3-pin plug-in screw terminal type connectors (3.5mm pitch). All inputs have a level control adjacent to their respective connector. Rear panel mounted switches provide input routing on channels 2 to 8 allowing a variety of configurations.

In its default configuration, the unit operates as eight independent amplifiers. Four stereo pairs, driven from one stereo source and eight channels driven from one mono source are also possible by suitably configuring the input routing switches. Schematic diagrams of the switching network in various configurations can be found on page 3.

5 Input Routing Diagrams

8 independent mono amplifiers

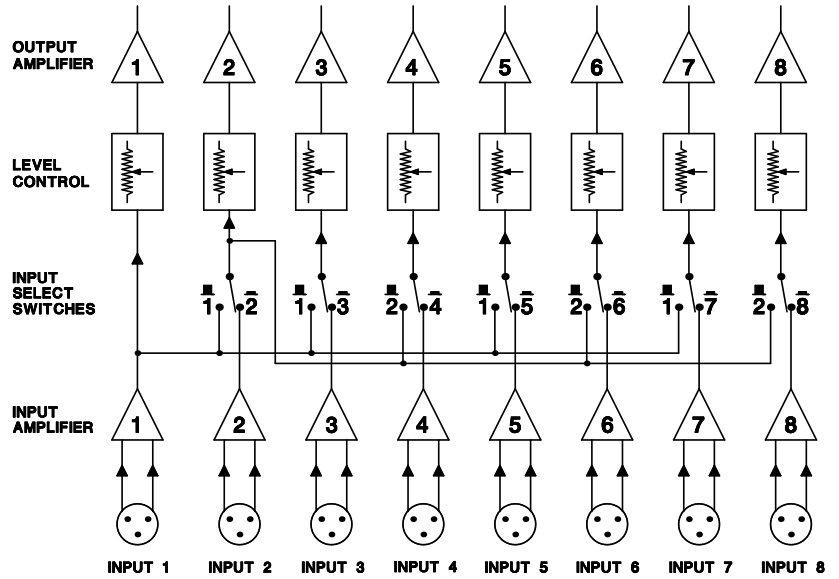


Fig 1

8 mono outputs fed from 1 mono input

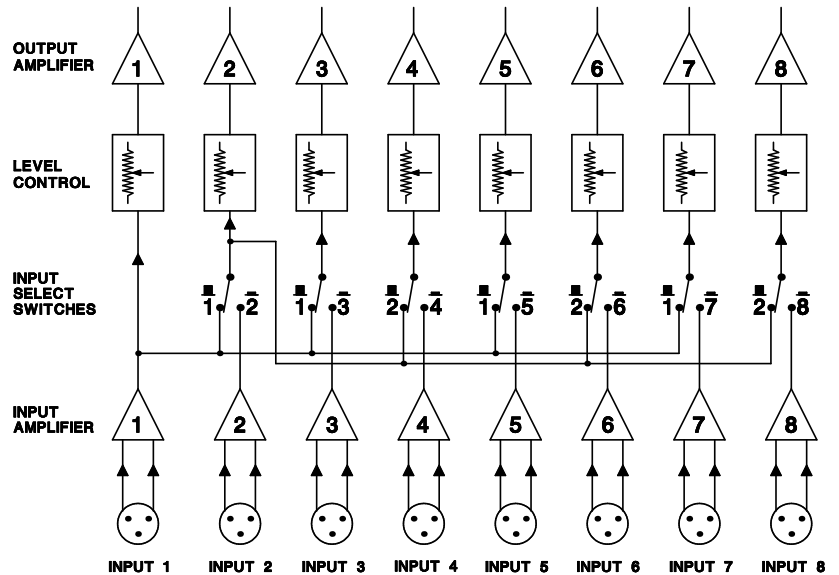


Fig 2

4 stereo amplifier pairs fed from 1 stereo input pair

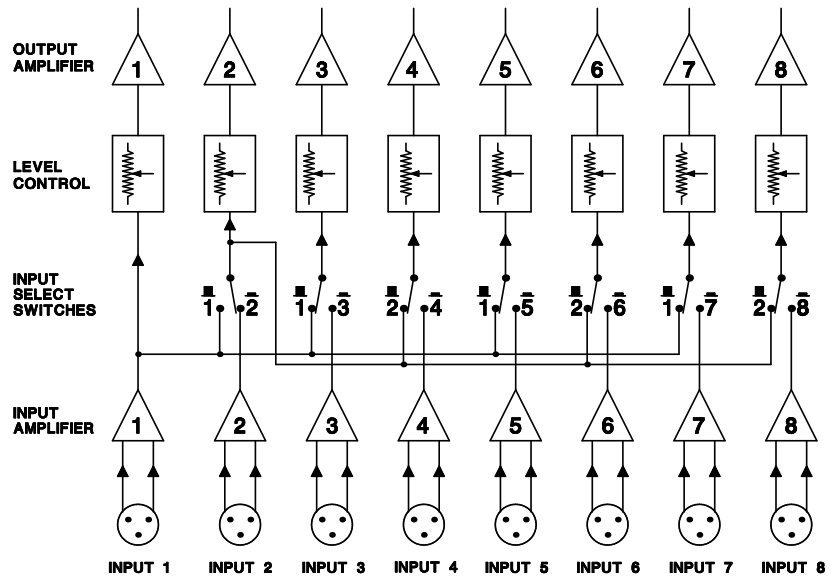


Fig 3

6 Output Details

Eight 2-pole plug-in screw terminal type connectors (5mm pitch) are provided on the rear panel for the eight speaker outputs; these can accommodate flexible leads up to 2.50mm². Do not make any connections to the unit with the power cable attached. It is good practice to distance the output wiring from the input wiring and keep the speaker wires twisted until they are terminated to reduce any cross-talk to a minimum level.

7 100V Line operation

An optional single-channel externally mounted 40W 70V/100V-line transformer module (CXL-40T) is available for the CX-A850. The installer can select 70 or 100V operation by wiring the speaker network to the 70V or 100V output terminals on the CXL-40T. When a CXL-40T is installed to a zone, the 65Hz high pass filter for that zone must be switched on using the appropriate jumper/s. The instructions below detail the procedure you must follow to activate the appropriate filter

- 1) Turn the power off & remove the mains lead.
- 2) Remove the top panel from the unit.
- 3) Turn the relevant 65Hz high pass filter 'on' by moving the relevant jumpers to the 'ON' position (see list below).

J1 = Channel 1	J5 = Channel 5
J2 = Channel 2	J6 = Channel 6
J3 = Channel 3	J7 = Channel 7
J4 = Channel 4	J8 = Channel 8

Jumpers J1-8 are located from left to right on the PCB, 57mm in from the rear panel.

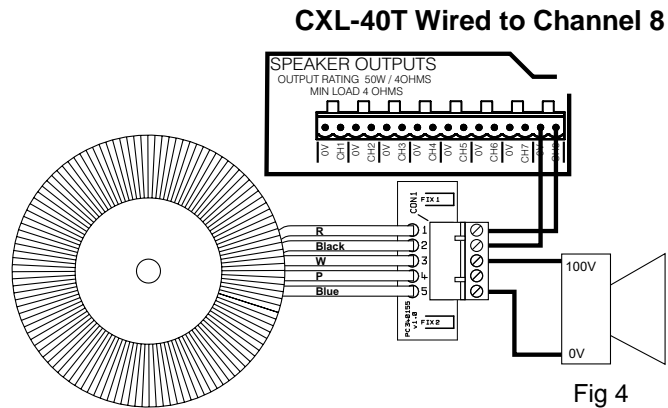
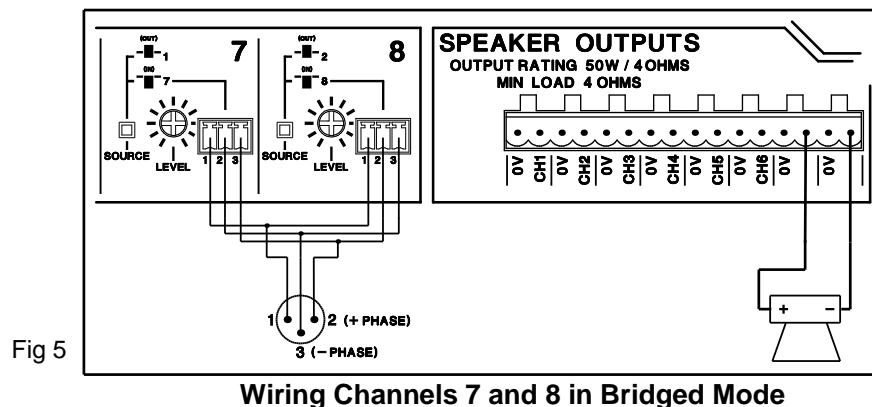
- 4) Replace the top panel.

If a filter is not switched on, operation at high input levels and low frequencies may result in the transformer saturating and the amplifier's VI and clip limiting operating.

A 2U 19" rack panel (CXL-800) is also available which can accommodate up to 8 CXL-40T transformer modules.

8 Bridged Mode Operation

The unit can be operated in Bridged Mode using any two channels (see Fig 5). The two amplifiers that are to be bridged must have the same signal input fed to each of them and be out of phase with each other. The input level controls of the two channels should both to be set to the fully clockwise position.



The output load should then be connected between the two positive (HOT) outputs of the relevant channels (no connection to common). You must ensure that the positive wire is connected to the "first channel" output and the negative wire is connected to the "second channel" output (see fig 5).

9 Status Indicators

The front panel of the CX-A850 has an array of LED's that indicate the status of all eight channels (see Fig 6).

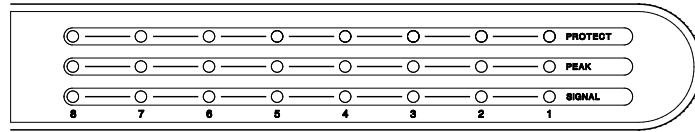


Fig 6

The lower green 'signal' LED illuminates when a signal is detected, the yellow 'peak' LED will illuminate when the amplifier's DCP is operating and the top red 'protect' LED indicates that the protection relay has disconnected the load. Please note that it is normal for all four red LED's to illuminate for approximately five seconds when the unit is switched on, indicating operation of the switch-on delay circuitry. The green 'power' LED at the bottom right of the front panel illuminates when the power is switched on.

10 Power Supply Capacity

The CX-A850 has up to 100mA of available current for use with additional modules. Exceeding this limit will cause temporary power supply failure. Use the table below to verify your proposed system does not exceed this limit.

Module Name	Current Required
BOSE® EQ cards: M8, M32, MA12, 402, 502A, 802, MB4, MB24, 502B, 502BEX	12mA
BOSE® EQ cards: LT3202, LT4402, LT9402, LT9702	17mA
BOSE® EQ card: M16	24mA
VCA-5	9mA

11 VCA Modules

A single channel VCA module 'VCA-5' is available as a plug-in option for each of the eight channels. When a VCA-5 is installed to a channel it allows the channel to be controlled remotely with the optional RL-1 remote plate.

The circuitry uses the industry standard 'Thats 2150A' VCA providing very low distortion and up to 90dB attenuation. The VCA module can be wired to provide muting by using an auxiliary relay connected to a fire alarm control panel. Contact our technical department for further details.

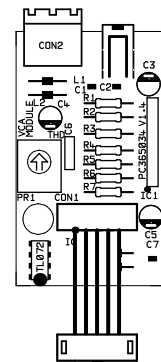


Fig 7

12 VCA Module Installation

1. Turn the power off and remove the mains cable
2. Remove the top panel
3. Select the required PCB mounted VCA connector and remove its jumper (see list below & Fig 8)
 - CON1** = Channel 1 **CON5** = Channel 5
 - CON2** = Channel 2 **CON6** = Channel 6
 - CON3** = Channel 3 **CON7** = Channel 7
 - CON4** = Channel 4 **CON8** = Channel 8
4. Unscrew the relevant blanking plate from the rear of the unit & retain the screw.

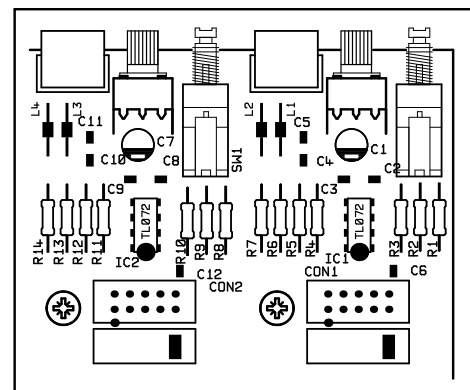


Fig 8

5. Adjacent to the connector there is an M3 fixing screw remove & retain this screw then fit a 35mm M3 hex spacer (supplied) in its place.
6. Push the 10-way VCA plug onto the PCB connector, aligned so the cable enters it from the rear of the chassis (See Fig 9) check there is contact with all 10 pins.
7. Position the VCA modules 3-pin socket through the rear panel cut-out and secure using M3 screws (both removed earlier)
8. Replace the top panel.

Side View of VCA Ribbon Cable

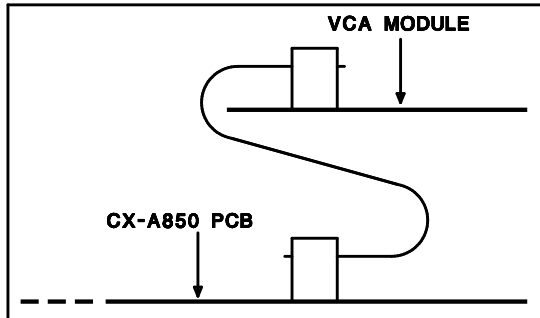


Fig 9

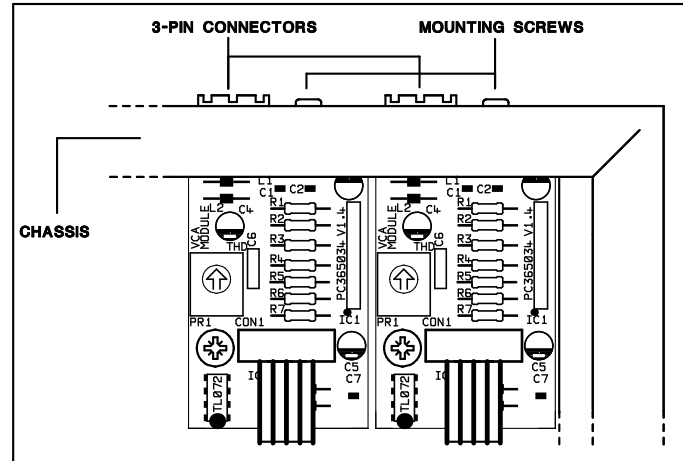


Fig 10

13 Remote Level Plate Connections

The RL-1 is a remote control plate that allows the level of a specific channel to be remotely controlled (in conjunction with the VCA-5). The RL-1 is compatible with UK domestic electrical accessories and can be mounted onto a standard British flush or surface mounted 25mm deep back box.

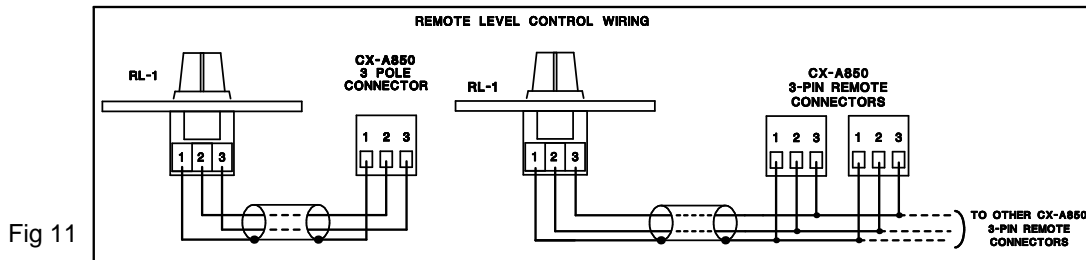


Fig 11

As Fig 11 shows, the RL-1 is to be connected to a CX-A850 remote connector with a two-core cable that has an overall screen. It is possible to connect a single remote control module to control more than one channel simultaneously (Fig 11 right). As more channels are linked the law of the control will be compromised resulting in an uneven control of volume; this has proved to be of little consequence operationally.

14 Speaker Equalisation Modules

Each channel of the CX-A850 can have a speaker equalisation module installed so that its output will be compensated correctly for a wide range of speakers.

Available Equalisation Modules:

- Bose® Speaker models: M8, M16, M32, MA12, 402, 502A, 502B, 502BEX, 802, MB4, MB24, LT3202, LT4402, LT9402, LT9702

15 Equalisation Module Installation

1. Turn the power off and remove the mains lead.
2. Remove the top panel from the unit.
3. Select the required PCB connector (see Fig 12 adjacent) that you wish to install the equalisation module to and remove the jumper from it.

CON12 & J9 = Channel 1
CON13 & J10 = Channel 2
CON14 & J11 = Channel 3
CON15 & J12 = Channel 4
CON16 & J13 = Channel 5
CON17 & J14 = Channel 6
CON18 & J15 = Channel 7
CON19 & J16 = Channel 8

Channel 7&8 PCB Connector Locations

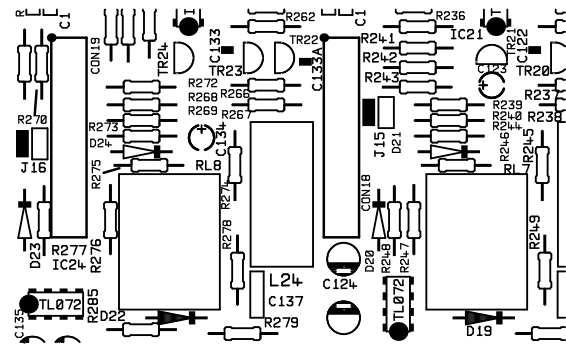


Fig 12

4. Configure the relevant 65Hz filter to 'ON' and connect a CXL-40T 100V line transformer (see section 7)
5. Fit the EQ card to the connector such that the EQ card is perpendicular to the main board
6. Push down on the EQ card until it locates with a click.
7. Replace the top panel.

NOTE: Before installing active modules, check section 10 for details of the power supply on the CX-A850. Each channel of the CX-A850 can have both a VCA-5 module and a speaker EQ card installed at the same time.

16 Field Servicing

The CX-A850 is ruggedly built and uses proven reliable circuitry. It requires no more than the occasional removal of any dust that may have built up inside the unit because of the forced cooling.

17 General Specifications

Inputs	Balanced via 3-pin plug-in screw terminal type connectors
Outputs	2-pin plug-in screw terminal type connectors for flexible cables up to 2.5mm ²
Protection	VI limiting, DC offset, Thermal, Switch-on Delay & Dynamic Clipping Protection
Status Indicators	LED indicators on each channel for Signal, Peak & Protect
Cooling	Force cooled using variable speed DC fan
Dimensions	482.6mm x 88.0mm (2U) x 300.0mm deep (+ connectors)
Weight	8.8kgs

18 Technical Specifications

Number of Channels Driven	Rated Output 4 Ohm load(s)	Rated Output 8 Ohm load(s)
1	62W	36W
2	58W	34W
3	54W	32W
4	50W	30W
5	47W	29W
6	44W	28W
7	41W	27W
8	38W	26W

Bridged Output	100W nominal into 8 Ohm load, minimum load 8 Ohms
Frequency Response	+0dB -0.5dB 10Hz to 20kHz, switchable high pass filter -3dB @65Hz
THD+N	0.007%, typical, @1kHz, 60W into 4 Ohms, one channel driven, measurement BW 22Hz to 80kHz
VCA Module THD+N	<0.03% 1kHz, measurement BW 22Hz to 80kHz
Crosstalk Typical, between adjacent channels	-85dB (relative to 60W) @1kHz with 4 Ohm load
	-82dB (relative to 60W) @10kHz with 4 Ohm load
	-90dB (relative to 30W) @1kHz with 8 Ohm load
	-90dB (relative to 30W) @10kHz with 8 Ohm load
Input Sensitivity	0dBu (775mV)
Input Impedance	10k balanced / 5k unbalanced
Noise	<96dB rms below rated output, unweighted, measurement BW 22Hz to 22kHz
Power Input	230V \pm 5% (115V \pm 5% available)
Fuse rating	230V – T4A H 115V – T8A H
Fuse type	20mm x 5mm class 3T 250V

This product conforms to the following European EMC Standards:

BS EN 55103-1:1997

BS EN 55103-2:1997



This product has been tested for use in commercial and light industrial environments. If the equipment is used in controlled EMC environments, the urban outdoors, heavy industrial environments or close to railways, transmitters, overhead power lines etc. the performance of the unit may be degraded.

The product conforms to the following European electrical safety standard.

BS EN 60065:1998

Safety Considerations and Information

The unit must be earthed. Ensure that the mains power supply provides an effective earth connection using a three-wire termination.

When the mains switch is in the off 'O' position the live and neutral conductors of the mains transformer are disconnected, however some parts of the product will still remain connected to the live and neutral mains conductors

CAUTION – Installation

- Do not expose the unit to water or moisture
- Do not expose the unit to naked flames.
- Do not place liquid filled containers on or around the unit
- Do not block or restrict any air vent
- Do not operate the unit in ambient temperatures above 45°C

CAUTION – Hazardous Live

Do not touch any part or terminal carrying the hazardous live symbol () while power is supplied to the unit.

Terminals to which the hazardous live symbol refers require installation by a qualified person.

CAUTION - Mains Fuse

Replace the mains fuse only with the same type and rating as marked on the rear panel. The fuse body size is 20mm x 5mm.

CAUTION – Servicing

The unit contains no user serviceable parts. Refer servicing to qualified service personnel. Do not perform servicing unless you are qualified to do so.

Disconnect the power cable from the unit before removing the top panel and do not make any internal adjustments with the unit switched on.

Only reassemble the unit using bolts/screws identical to the original parts

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In the interest of continuing improvements Cloud Electronics Limited reserves the right to alter specifications without prior notice.

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