BSC-3 BusCard
INSTALLATION INSTRUCTIONS

OPERATING DESCRIPTION

A conceptual follow-up to the previous two BusCard versions made for PowerLight amplifiers, the BSC-3 BusCard is made for PLX Series and two-channel CX and DCA Series amplifiers for adding optional features, such as internal filtering and input isolation transformers.

The BSC-3 has one 22-pin slot for an embedded ("Mini-Slot") processor card and positions for installing one XF-1 Input Isolation Transformer per channel. Four wire jumpers can be replaced by resistors for reducing the amplifier's gain (and raise its input sensitivity); this is sometimes necessary to make the amplifier compatible with speaker processors that require less than 32 dB of maximum gain.

A pair of switches on the underside of the BusCard are accessible from outside the amplifier, through existing holes in the side panel of the chassis. These switches allow the user to enable and bypass the filtering without having to remove the amp's top cover, as Figure 1 shows.

NOTE: The BSC-3 does not work with the DataPort or Phoenix inputs of CX and DCA Series amplifiers.

Embedded ("Mini-Slot") processors

One processor can be installed on the BSC-3. The following are among those commonly used.

- **Universal Filter (UF-2 or UF-3).** Programmable 4th order Linkwitz-Riley two-channel filter with CD horn boost. The card is configurable for high-pass, low-pass, or bandpass filtering with a wide selection of corner frequencies, making it suitable for use as a crossover, CD horn equalizer, subsonic filter, or other functions. The UF-3 is functionally equivalent to the UF-2 but is more compact to fit in more amplifier models.

- **SPL-1 Stereo Power Limiter.** Two-channel limiter featuring precision RMS converters and VCAs from THAT Corp. The independently programmable threshold settings are scaled in proportion to the amplifier's maximum output levels. Each channel also can be independently programmed for fast, medium, or slow attack/release. The accessory is useful for power-limited speaker protection, making it ideal for rental sound systems.

  The SPL-1 monitors the actual amplifier output signals, requiring the installation of a resistive scaling network and coupling capacitors on the BusCard, as well as wire connections to the amplifier output buses. Because of these complexities, installation of the SPL-1 should be left to QSC factory service or to a qualified technician.

- **SEQ-1 Stereo Shelving Equalizer.** Two-channel equalizer with on-board trimpots to independently control high- and low-frequency boost and cut. Adjustment ranges are ±13 dB at 40 Hz and ±10 dB at 10 kHz.

- **SEQ-2 Stereo Graphic Equalizer.** Two-channel 5-band equalizer with on-board trimpots to control boost and cut at 40 Hz, 160 Hz, 630 Hz, 2.5 kHz, and 10 kHz. Adjustment ranges are ±12 dB.

Input isolation and gain adjustment

The BSC-3 can accommodate two input transformers, and it also allows custom gain adjustment.

- **XF-1 Input Isolation Transformer.** Precision balanced Jensen transformers custom-made for QSC. Ideal for rejection of electromagnetic and electrostatic noise picked up by input audio lines.

- **Input Resistor Slots.** Allows custom gain structure required for some speaker excursion processors.

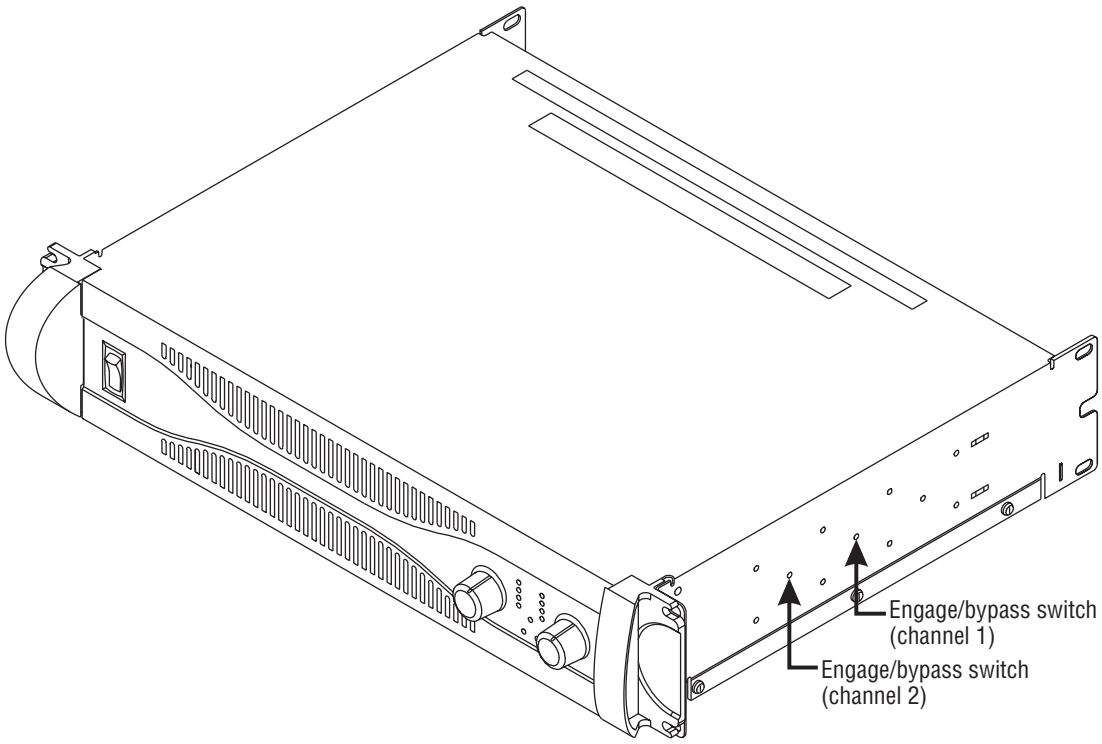


Figure 1. BSC-3 ENABLE/DISABLE ACCESS

BSC-3 Kit Contents:	**Qty.**
1. BSC-3 BusCard	1
2. #4-40 x ¼" PP black screws	5
3. 20-pin IDC plugs	2
4. Power cable	1

Optional parts

Embedded "Mini-Slot" processor kit (sold separately)	1
XF-1 Input Transformer Kit (sold separately)	1 or 2*
Gain alignment resistors (sold separately)	4

Scaling network (depends on amp model; contact QSC Technical Services for info)

*(each kit contains one transformer, a resistor, and a capacitor)

Tools needed for installation:

1. Long-nose pliers
2. Philips screwdriver
3. Small slot screwdriver
4. IDC connector clamp tool
5. Wire cutters
6. Scissors
7. Soldering iron and rosin-core solder
8. Desoldering equipment

CAUTION: To reduce the risk of electric shock, refer servicing to qualified service personnel.
WARNING: To prevent fire or electric shock, do not expose this equipment to rain or moisture.

**Before proceeding with installation,
disconnect the amplifier from AC power.**

BSC-3 BUSCARD PREPARATION

Before installing the BSC-3 in the amplifier, configure it with the accessory functions and features desired. The following steps describe the installation of Input Isolation Transformers, a UF-2 Universal Filter/Crossover, and gain adjustment resistors. See Figure 2 for component and slot locations.

Installing input isolation transformers:

STEP 1.
Unsolder and remove jumpers W301 and W302 (Channel 1) and/or W401 and W402 (Channel 2) from the BSC-3.

STEP 2.
Install the input transformers at T301 (Channel 1) and/or T401 (Channel 2). Make sure each is oriented correctly before soldering it in place.

STEP 3.
Install and solder the resistors and capacitors R301 and C303 (Channel 1) and/or R401 and C403 (Channel 2) into their respective places on the BSC-3. Trim the leads.

Installing an embedded processor card:

To install an SPL-1, contact QSC Technical Services for instructions.

STEP 1.
Program the processor accessory as described in its manual.

STEP 2.
Insert the processor fully into J3 on the BSC-3 card and solder all 22 pins. Be careful to avoid solder bridges. Do not trim the pins.

STEP 3.
Set the engage/bypass switches SW301 and SW401 as desired: **OUT = accessory bypassed**, and **IN = accessory engaged**.

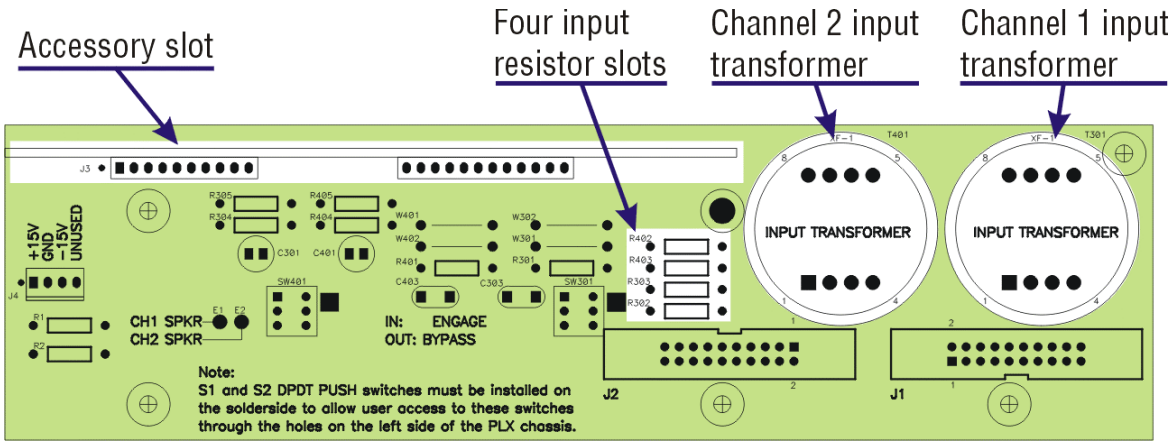


Figure 2

Installing gain adjustment resistors:

From Tables 1 and 2 below, determine the correct resistor values for R302, R303, R402, and R403. To maintain a high immunity to common-mode noise, use only metal film resistors of 1% tolerance or better.

STEP 2.

Unsolder and remove the jumpers at R302, R303, R402, and R403.

STEP 3.

Insert and solder the resistors at R302, R303, R402, and R403. Trim the leads.

TABLES 1 & 2: GAIN ALIGNMENT RESISTOR MATRIX (STEREO MODE):

	Desired gain	
Model	**26 dB**	**32 dB**
PLX1202	5.62 kΩ	0 (no change)
PLX1602	5.62 kΩ	0 (no change)
PLX2402	5.62 kΩ	0 (no change)
PLX3002	5.62 kΩ	0 (no change)
PLX3402	5.62 kΩ	0 (no change)
DCA1222	10.0 kΩ	0 (no change)
DCA1622	10.0 kΩ	0 (no change)
DCA2422	10.0 kΩ	0 (no change)
DCA3022	10.0 kΩ	0 (no change)
DCA3422	10.0 kΩ	0 (no change)

	Factory Input Sensitivity for Full Rated FTC Power @ 8Ω (Vrms)	Desired Input Sensitivity	
Model		**1 Vrms**	**+4 dBu (1.23 Vrms)**
PLX 1202	1.0	0 (no change)	1.29 kΩ
PLX 1602	1.2	N/A	0 (no change)
PLX 2402	1.5	N/A	N/A
PLX 3002	1.7	N/A	N/A
PLX 3402	1.9	N/A	N/A
DCA 1222	1.0	0 (no change)	2.32 kΩ
DCA 1622	1.2	N/A	0 (no change)
DCA 2422	1.5	N/A	N/A
DCA 3022	1.7	N/A	N/A
DCA 3422	1.9	N/A	N/A

INSTALLATION PROCEDURE

This guide is meant to assist qualified technicians with the installation of the BSC-3. This procedure should only be performed by a QSC Authorized Service Center or by QSC Technical Services.

Before proceeding, please make sure the amplifier is not connected to AC power.

STEP 1.

The "top cover" of the amplifier is actually on the bottom of the chassis. Turn the amplifier upside-down and remove the cover.

STEP 2.

Locate the 20-conductor input ribbon cable and three DC power pads as shown in Figure 3.

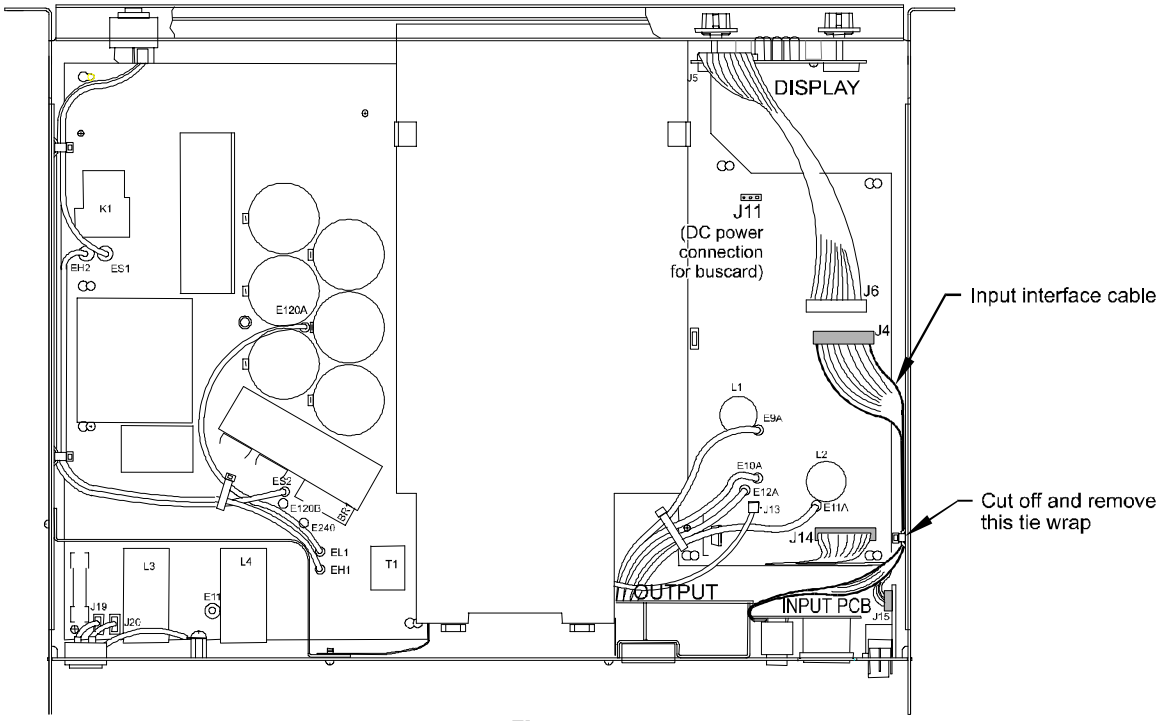


Figure 3

STEP 3.

Using sharp scissors, cut squarely and cleanly across the cable at the point shown in Figure 4 (3.20 inches or 8.1 cm from the end attached to the main PCB). Using the IDC connector clamp tool, install the 20-pin IDC plugs (provided in the BSC-3 kit) at the cut ends of the input cables as shown.

In case the cut or the connector preparation is unsuccessful, contact QSC Technical Services for a free replacement ribbon cable.

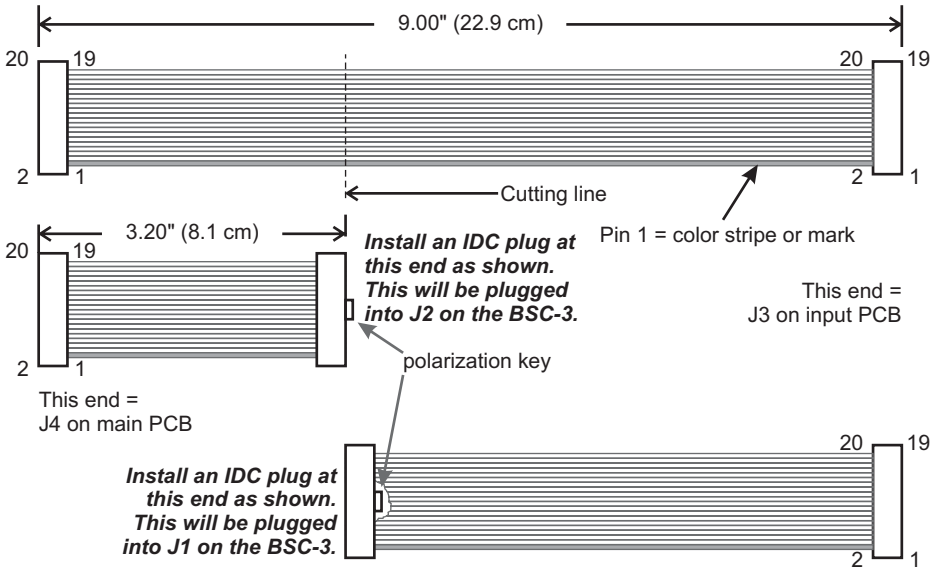


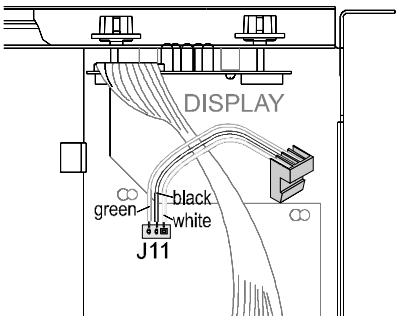
Figure 4

STEP 4.
After you've attached the new IDC connectors to the cut cable ends, insert the new 20-pin plug on the cable from the amplifier's input PCB into J1 on the BSC-3 card. Press J1's locking tabs together so it holds the plug securely.

Insert the plug on the cable from the main printed circuit board into J2 on the BSC-3 card, and lock it in. In the amplifier signal flow, this places the BSC-3 between the amplifier's input PCB and its main PCB.

STEP 5.
Use five #4-40 screws to mount the BSC-3 assembly onto to the inside of the amplifier chassis. There is no mounting hole on the amplifier chassis for the upper right corner standoff (the one next to transformer T301) on the BSC-3, so it does not use a screw.

STEP 6.
If no processor card is installed on the BSC-3, you may skip Step 6 and continue to Step 7.
Remove the solder from the three holes at J11 on the main PCB (see illustration at right). Install and solder the three-conductor DC power cable to J11; be careful to avoid solder bridges. At the other end of the power cable, connect the plug to J4 on the BSC-3 card.



STEP 7.
Reinstall the top cover. The unit is now ready for use.

NOTE: If no processor card is installed, the engage/bypass switches must be always in the "bypass" or *out* position; otherwise, the audio signals will not pass. These switches are accessible from outside the amplifier. See Figure 1.

FOR FURTHER ASSISTANCE, PLEASE CONTACT QSC TECHNICAL SERVICES
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