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CONTENTS

Calrec	Customer Support		ł	
Health	and Safety	6	;	
1	Introduction	-	,	
۱. د	Important acfety information		,	
Ζ.				
3.	Brio assemblies		5	
	a) Brio main assemblies		,	
	 b) Bho panel sub-assemblies and their locations. c) Brig internal sub-assemblies and their locations 	1	0	
4	C) Dio internal sub-assemblies and their locations		ו רו	
4. 5		· · · · · · · · · · · · · · · · · · ·	3	
5.	How are Brio sub-assembles removed and replaced ?		5	
	a) Removing the upper fader assembly	(106290) (MI 16297)	10	
	c) Removing the fader control cards	(MOO207)		
	 d) Removing the user interface / touchscreen display. 	(MI 6293)	20	
	e) Removing the monitor control card	(MN6245)	.0 21	
	f) Removing the internal IO cards	(JI6241)	22	
	g) Removing the headphone / talkback mic card	(PT6252)	<u>2</u> 4	
	h) Removing the XLR interface cards	(SN6243)	25	
	i) Removing the BNC / GPIO interface cards	(SN6242)2	26	
	j) Removing the expansion IO backplane	(HN6248)2	27	
	 Removing the main processing engine 	(UN6244)2	29	
	 Removing the Hydra2 options card 	(US6249)	32	
	m) Removing the power distribution card	(ZN6247)	33	
	n) Removing the power supply units	(ZN6292)	34	
6.	Replacing a fader		36	
7.	Fader calibration		37	
8.	Replacing rotary encoders			
9.	Replacing a mini-display	4	1	
10.	. Replacing the cooling fan			
11.	Installing a Hydra2 options card (US6249)			
12.	Internal wiring diagram			
13	llseful nart numbers			



CALREC CUSTOMER SUPPORT

Should you require any technical assistance with your Calrec product please contact your regional Calrec distributor. Customers within the UK or Ireland should contact Calrec directly.

For a complete list of worldwide distributors by region, go to www.calrec.com or contact us for more information.

Our UK customer support team works closely with our global distributor network to provide the highest level of after sales support. Your distributor should be your first point of contact and will often be able to provide an instant solution, be it technical advice, spares or a site visit by an engineer.

Product Warranty

A full list of our conditions and warranties relating to goods services is contained in Calrec's standard terms and conditions. A copy of this is available on request.

Repairs

If you need to return goods to Calrec for whatever reason, please contact your regional distributor or Calrec customer support beforehand for guidance, as well as to log the details of the problem and receive a reference number.

Telephone: (9:00am-5.30pm)	+44 (0) 1422 842159
Email - Technical:	support@calrec.com
Email - General:	enquiries@calrec.com
Postal Address:	Calrec Audio Ltd. Nutclough Mill, Hebden Bridge, West Yorkshire, HX7 8EZ, UK
Fax:	+44 (0) 1422 842159
Website:	www.calrec.com

For customers outside the UK and Ireland, shipping via the distributor saves customers from dealing with exportation paperwork. If there is a need to send direct to Calrec, contact us beforehand to log the incoming repair and for assistance with exportation documents.

Standard of Service

Ensuring the highest standards is a priority, if you have any comments on the level of service, product quality or documentation offered to you by Calrec, please contact the Calrec Customer Support team in the UK who will endeavour to address your issues. Calrec welcomes all customer feedback.

For feedback specific to this document, please contact enquiries@calrec.com.

Whenever you contact Calrec Customer Support please have the following information to hand: • Name.

- Company.
- Email Address.
- Email Address.
 Full details of angle
- Full details of enquiry (e.g. fault report).
- Serial number of faulty hardware (if applicable).

Once this information has been provided, a service ticket will be created to log your enquiry. The service ticket reference number will be given via email.

Serial Numbers

All units produced by Calrec are given a serial number and are booked into a central record system at the time of manufacture. These records are updated whenever a piece of hardware is dispatched to or received from a customer.

When contacting Calrec Customer Support with a hardware inquiry it is important that the correct Calrec serial number is provided to enable the customer support team to provide a high level of service. Brio 36 serial numbers can be found on the label on the rear of the chassis as shown below.

After Sales Modifications

Please be aware that any modifications other than those made or approved by Calrec Audio Limited or their agents, may invalidate the console's warranty. This includes changes to cabling provided by Calrec and variations to the recommended installation as detailed in Calrec documentation.

Modifications to this equipment by any party other than Calrec Audio Limited may invalidate EMC and safety features designed into the equipment. Calrec Audio Limited cannot be liable for any legal proceedings or problems that may arise relating to such modifications.

If in doubt, please contact Calrec Audio Limited for guidance prior to commencing any modification work.

Example of label on rear of chassis showing serial number

BRID36		
	by UNENEU	MARNING: THIS APPARATUS MUST BE EARTHED DO NOT RESTRICT VENTILATION HOLES
MODEL:	36 fader	ENSURE ALL COVERS & SCREWS ARE FITTED MAX. AMBIENT OPERATING TEMPERATURE 40°C
SERIAL NO:	154388	Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistoraaisaan. Apparaten hai tiikoplee jordet stikkontakt. Apparaten skall anslutas till jordat uttag.
DATE OF MANUFACTURE:	JUN 2016	This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept interference recieved, including interference that may cause undesired operation.
INPUT RATING (MAX):	100-240V AC ~ 1.55-0.92A RMS 50/60Hz	Made in UK by CALREC AUDIO Ltd. Nutclough Mill, Hebden Bridge, West Yorkshire, HX7 8EZ Email: support@calrec.com Tel: +44(0)1422 842 159 www.calrec.com

Installation

In many installations the AC power connectors will not be readily accessible, effectively making the equipment permanently connected. The installation should be carried out in accordance with all applicable installation rules and regulations.

Service Personnel

The AC power disconnect devices are the 2 x IEC (IEC60320-1 C13/C14) couplers located at the rear of each unit.

WARNING: The apparatus has a dual power system. It is essential that BOTH AC power IEC couplers are disconnected to prevent exposure to hazardous voltage within the unit.

Third Party Equipment

Integrating third party equipment into a Calrec system may compromise the product's ability to comply with the radiated emission limits set in the EMC (Electro Magnetic Compatibility) standard EN55022.

Calrec Audio Limited cannot be responsible for any non-conformities due to use of third party equipment. If in doubt, please contact Calrec Audio Limited for guidance prior to integrating any third party equipment.

ESD (Static) Handling Procedures

In its completed form, this equipment has been designed to have a high level of immunity to static discharges. However, when handling individual boards and modules, many highly static sensitive parts are exposed. In order to protect these devices from damage and to protect your warranty, please observe static handling procedures, for example, use an appropriately grounded anti-static wrist band. All modules and cards should be returned to Calrec Audio Limited in anti-static wrapping. Calrec Audio Limited can supply anti-static wrapping upon request.

This applies particularly to digital products due to the types of devices and very small geometries used in their fabrication, analogue parts can, however, still be affected.

RoHS Legislation

In order to comply with European RoHS (Reduction of Hazardous Substances) legislation, Calrec PCB and cable assemblies are produced with lead-free (tin/copper/silver) solder instead of tin/lead solder.

In the unlikely event of a customer having to carry out any re-soldering on any Apollo, Artemis, Summa, Brio36 or Hydra2 hardware, it is imperative that lead-free solder is used; contaminating lead-free solder with leaded solder is likely to have an adverse effect on the long-term reliability of the product. Circuit boards assembled with lead-free solder can be identified (in accordance with IPC/JEDEC standards) by a small oval logo (see below) on the top-side of the circuit board near the PCB reference number (8xx-xxx). The same logo is used on the connector hoods of soldered cable assemblies.

If in doubt, please check with a Calrec customer support engineer before carrying out any form of re-soldering.

🔘 C A L R E C

ISO 9001 and RAB Registered

Calrec Audio Ltd has been issued the ISO9001: 2008 standard by the Governing Board of ISOQAR.

The award, for both UKAS and RAB registration (see below), is the most comprehensive of the ISO9000 international standards. Granted in recognition of excellence across design, development, manufacture and aftersales support, the certification follows a rigorous and thorough review of Calrec's internal and external communication and business procedures.

UKAS and ANAB Registration



Lead Free



Lead Free Stickers



HEALTH AND SAFETY

Important Safety Instructions:

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Do not block any ventilation openings.
- Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
- Protect the power cord from being walked on or pinched particularly at the plugs, convenience receptacles, and the point where they exit from the apparatus.
- Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operator normally, or has been dropped.
- Warning: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
- Not intended for outdoor use.
- This equipment must be EARTHED.
- Before starting any servicing operation, equipment must be isolated from the AC power supply. The disconnect devices are the 2 x IEC connectors (IEC 60320-1 C13/C14 couplers).
- Do not allow ventilation slots to be blocked.
- Do not leave the equipment powered up with the dust cover fitted.

Cleaning

For cleaning the front panels of the equipment we recommend using a soft anti-static cloth, lightly dampened with water if required.

Explanation of Warning Symbols

Triangular warning symbols contain a black symbol on a yellow background, surrounded by a black border.

The lightning flash with arrow head symbol within an equilateral triangle, as shown on this page, is intended to alert the user to the presence of dangerous voltages and energy levels within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock or injury.

The exclamation mark within an equilateral triangle, as shown on this page, is intended to prompt the user to refer to important operating or maintenance instructions in the documentation supplied with the product.

Earthing

This is a Class I product. An Earth connection MUST be provided in each AC power cord.

The Earth Bolt connection at the rear of the console is provided for those users who wish to have a separate ground/earth connection using Earth cable at least 6 mm2 in cross section (10 AWG), this connection is optional and is NOT a requirement to comply with safety standard.

Lithium Battery Replacement

Caution: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type. Batteries must not be exposed to excessive heat such as sunshine, fire or the like

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1. This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Dangerous Voltages



Other Symbols in Use For apparatus intended to be used at altitude not exceeding 2000m, a warning label containing the following symbol shown below shall fixed to the equipment at readily visible place.

Altitude Warning Symbol



Lifting and Carrying Brio 36

Brio 36 has two lifting handles on the rear of the unit. These should be used when lifting the unit into place. Note: this unit weighs approximately 30kG and requires at least 2 persons to lift or carry the unit.

Levelling or Fixing Brio 36 on a surface for table mount.

Brio 36 has four adjustable feet on its base which can be used to level the console on a surface. Alternatively these can be removed and four M6 screws fitted to fix the console in place. Note the screws should not screw in further than 20mm into the body of the unit.

1. INTRODUCTION

This technical manual is intended to provide detailed instructions explaining how Brio console subassemblies and some basic components can be replaced. It is assumed that the Brio is located on a table top, as opposed to being integrated into studio furniture. If the Brio is integrated into studio furniture, you may first need to remove it so that the rear interface panel of the Brio can be accessed.

The procedures described in this manual detail the removal of items. Unless otherwise stated, the reassembly process is simply the removal process in reverse.

All sub-assemblies can be replaced, with just some basic tools:

- 2mm hex driver
- M3 Pozi screw driver
- M4 Pozi screw driver
- 5.5mm nut runner / spinner / socket
- Wire cutters, for cable ties
- Replacement cable ties (330-137)

2. IMPORTANT INFORMATION

- The Brio console must always be disconnected from the mains power before removing or disconnecting ANY cables, cards or components.
- The processes detailed in this technical manual should only be undertaken by a qualified technician.
- ESD (Electro Static Discharge) precautions must be undertaken when handling any of the Brio's printed circuit boards. Failure to do so, may cause damage and could invalidate the warranty.
- Calrec consoles are manufactured using lead free components and lead free solder. Any soldering work carried out on the Brio, must use a lead free soldering work station.
- Before undertaking a procedure, please read through the whole procedure to ensure that you fully understand and are happy to complete all the required steps. Please be aware that Calrec, and your local distributor, can carry out repairs on your behalf, and provide replacement sub-assemblies.
- Avoid touching the image surface of TFT displays.
- For guidance on optional expansion IO cards or external IO boxes, please refer to the Brio and Hydra2 installation manuals, available at www.calrec.com/downloads.



3. BRIO ASSEMBLIES

The Brio 36 console (SL6351) is constructed from a number of parts categorised as follows:

- Level 1: Main Assembles
- Level 2: Sub-Assemblies
- Level 3: Component parts

In terms of servicing and repair, this allows us to address potential problems in different ways depending on the complexity of repair and the level of skill or confidence of the service or repairs engineer.

For example, a faulty Level 3 component can be replaced directly, or by replacing the Level 2 Sub-Assembly on which the component fits.

It is more cost effective to replace an individual damaged fader or mini-TFT display than it would be to replace the sub-assembly on which it sits. Conversely, it may not be possible to determine the specific component at fault, in which case replacing the complete sub-assembly is a quicker, catch all solution to ensure that the issue is eliminated.

All assemblies and components units have a Calrec stock number in order to be easily identified:

- All assemblies (main and sub) have a stock number in the format AA1111 (two letters, four numbers).
- All component parts have a stock number in the format 111-111 (three numbers three numbers).

Most (but not all) assemblies will have a 6 digit serial number. If present, this will be found on a white sticker that also contains a barcode. Component parts are not serialised.

Some assemblies will contain an additional suffix in the format **-1** (a dash, 1 or more numbers) indicating a revision number (eg: **UN6244-2**). Unless otherwise stated all internal connections and instructions detailed below remain consistent regardless of revision number.

For a complete list of part numbers, please see section 11, "Useful part numbers".

3a. BRIO MAIN ASSEMBLIES

The Brio 36 surface is made up of the following two main assemblies:

- **IU6290** Lower surface assembly. This assembly contains 24 fader strips, split into two sub-sections of 12 fader strips.
- **MU6287** Upper surface assembly. This assembly contains 12 fader strips, a large TFT touch display interface, monitoring controls, the console reset button and a USB socket.



3b. BRIO PANEL SUB-ASSEMBLIES AND THEIR LOCATIONS

The Brio 36 surface's main assemblies are individually made up of the following sub-assemblies:

- CY6246 12 way fader control card. The Brio contains three of these units, one fixed to the underside of the upper surface assembly (MU6287) and two fixed to the underside of the lower surface assembly (IU6290).
- MU6293 User interface and touchscreen display. This is fixed to the underside of the upper surface assembly (MU6287).
- MN6245 Monitor control card. This is fixed to the underside of the upper surface assembly (MU6287).



Figure 2

3c. BRIO INTERNAL SUB-ASSEMBLIES AND THEIR LOCATIONS

The following sub-assemblies are located beneath the upper surface assembly and are fixed to the rear or base of the Brio 36's chassis:

- JI6241 Internal IO card. There are two of this card type fitted in a Brio console, located beneath faders 25-32.
- PT6252 Headphone and talkback mic card. This card is fitted to the lower of the two JI6241 cards.
- **SN6243** XLR interface card. There are two of this card type fitted in a Brio console, each fixed to the rear of the chassis, located beneath faders 25-32.
- **SN6242** BNC and GPIO interface card. There are two of this card type fitted in a Brio console, each fixed to the rear of the chassis, located beneath faders 25-32.
- **HN6248** Expansion IO backplane. This allows for the addition of up to three optional Modular IO expansion cards. This card is fixed to the centre rear of the chassis.
- **UN6244** Main processing engine. This provides the main processors for control and display. This card is fixed to both the rear and base of the chassis, located beneath the touch display and monitor section.
- ZN6292 Power supply unit. Two PSUs are fitted in each Brio in order to provide power redundancy. These are located to the far right hand side of the chassis, beneath the touch display and monitor section.
- ZN6247 Power distribution card. This card manages the load sharing between the two PSUs (ZN6292) and provides 12v power to other internal sub-assemblies. It also derives the +48v required for phantom power. This card is fixed to the base of the chassis, beneath faders 25-32.





Figure 4

Figure 4 above shows the same Brio with the upper JI6241 (Fixed Internal IO) card removed.

The lower internal IO card (JI6241), with the Headphone and talkback mic card (PT6252) fitted can now be seen, along with the second XLR and BNC / GPIO interface cards (SN6243 and SN6242 respectively).

4. BACKING UP USER DATA

Before undertaking any scheduled maintenance of the Brio console it is recommended that all user data contained on the console is backed up. This ensures that all data is safe and can be successfully restored in the event of unforeseen circumstances.

A backup includes every bit of information that is unique to a particular console including:

- Shows and memories
- General settings (including operating levels)
- Hydra2 configuration (system ID)
- Required IO (and port labels)
- LAN settings and control protocols
- GPIO and fixed patches
- Connect a laptop or PC to one of the Brio's two Ethernet ports located on the rear of the console. These are indicated by the red box in figure 5
- Configure a static IP address for the chosen Ethernet port via the "System Settings -> LAN Configuration" page, shown in figures 6 and 7.
 - N.B. Configuring the IP Address and Subnet Mask of the Ethernet ports requires admin privileges. The default admin login is:

User Name = calrec Password = calrec

- Configure the laptop or PC's LAN adapter with a unique IP address in the same range as that of the Brio's Ethernet port.
- On the laptop or PC, open the Google Chrome web browser (other web browsers are not currently supported).
- 5) Access the Brio Atomic Updater by entering the address of the relevant Brio Ethernet port, followed by :8090, as shown in figure 8.

For example, if the Brio's Ethernet port is set to 100.100.100.101, enter the address: 100.100.100.101:8090



Figure 5

Active Show	96kshow Cares -ett2107 (K6 kHz)	USB Date Proset USB Date Proset USB Date Proset OFF-AIR Paragr Source Deepfing Is CK
ф ⁶ ₀ General	Ethernet 1	Ethernet 2
Senergy Saver	Adapter Settings	Adapter Settings
-]- Synchronisation	IP Address 100.100.101 Edit	IP Address 192.168.1.2 Edit
Hydra2 Configuration	Subnet Mask 255.255.0 Gateway Not Set	Subnet Mask 255.255.0.0 Gateway Not Set
Required I/O Boxes		
-+ ● GP1	+ Add a New Static Boute	+ Addi a New Static Route
●→ GPO		
Jana Software		
LAN Configuration		
Po Control Protocols		
Global User Buttons		
👰 † Mic Open Systems		
On Air Protection Configuration		

Figure 6



Figure 7



Figure 8



- 6) On the left hand side of the browser page, select the "Backup User Data" tab, indicated by the red square in figure 9.
- In the main area, click on the "Backup" button, then navigate to the location in which you would like to save your user data.

You may provide a specific filename for the backup file or simply keep the default name (the default name includes the system ID, software version and a time stamp).

		9	Save As	
		🛞 🕑 = 🕇 🎍 « I	MCS_Backups > Bris 1,0 v G Search I	Jvie 1,0
	System ID - Brid 36	Organize - New fol	der	E •
Backup User Data	Version - 1.0.2	Desktop ^	Name D	ate modified Type
		Downloads	Colner, Backup, 192-1, vSumma 7-0, 2016 1- Re Colner, Backup, 192-2, v1-0-0, 2016-10-5, 01	4/10/2016 Hold2 CEK F 5/10/2016 09:33 CEK F
	Last User Data Backup -	Dictures		
Restore User Data	Calmer Backup 192.1 v1.0.2 2015.11.23 1702 rt	Videos		
-	General and the constant of the second of the second	Data (D:)	x	-
		Fiename Cab	wc_Backup_192-1_v1-0-2_2016-11-23_1702.cbk	
	21	Save as type: CBK	File ("cbk)	
Upload Software		Hide Tablers	5	w Cancel
	Backup User Data			
	User data will be copied and downloaded to your o	levice by your browse	r on clicking backup.	
	Please check your browser's default download loc	ation, or download set	ttings if you cannot locate your backup	
	Radius			
	скаскир			

Figure 9

It is recommended that a backup of the system's user data is taken after any major system changes (ie: addition of new IO; change to port label structure, etc) as this provides a restore point including shows, memories and H2O database information.

Backups can also be sent to Calrec support to assist with the reporting and investigation of potential issues.

5. HOW ARE BRIO SUB-ASSEMBLIES REMOVED AND REPLACED?

To access any of the mixer's sub-assemblies, with the exception of any optional Modular expansion cards, the lower surface assembly (IU6290) must first be removed.

5a. REMOVING THE LOWER SURFACE ASSEMBLY (IU6290)

1) Remove the twelve M3x12 black countersunk hex screws (350-553), using a 2mm hex driver.

The locations of these screws are highlighted by the red boxes in figure 10.

- Remove the two M4x16 pan head screws (350-047) from below the front trim, indicated by the yellow box in figure 10.
- 3) Lift the lower surface assembly by the area marked with the yellow box in figure 10. The panel will tilt upwards as shown by the blue arrow in figure 11.
- 4) Pull up the prop (700-435) as shown by the green arrow in figure 6 in order to hold the lower surface assembly in the upward position. The prop is indicated by green arrow in figure 12.
- 5) Disconnect the three cables from each of the two fader control cards (CY6246).

There are two RJ45 (Ethernet) connectors per fader control card. These are labelled A and B on the PCB.

The green cable connects to the port labelled A; the beige cable connects to the port labelled B.

Additionally there is a Yellow and Black power cable connected to the port labelled P on each fader control card.

6) Once all six cables have been disconnected, the prop can be lowered and the whole lower surface assembly can be removed by gently lifting the full assembly forwards.

Take care to locate the removed lower surface assembly in a safe place to avoid damage.



Figure 10



Figure 11



5b. REMOVING THE UPPER SURFACE ASSEMBLY (MU6287)

- **NOTE** Before removing the upper surface assembly, it is necessary to first remove the lower surface assembly (**IU6290**). Please refer to <u>section 5a</u> for full details.
- Remove the twelve M3x12 black countersunk hex screws (350-553), using a 2mm hex driver. The locations of these screws are highlighted by the red boxes in figure 13.
- Remove two M4x16 pan head screws (350-047) from the silver bar at the front of the upper surface assembly (these are only visible once the lower surface assembly has been removed, green arrows).

Their locations are indicated by the yellow box in figure 13.

- 3) Remove the silver bar (725-999124).
- 4) The panel can now be tilted up from the front (2) and the prop positioned (3), to hold the upper surface assembly in the open positon, as shown in figure 14.
- 5) Disconnect the three cables from the fader control card (CY6246) as shown in figure 15.

There are two RJ45 (Ethernet) connectors, labelled A and B on the PCB. The green cable connects to the port labelled A; the beige cable connects to the port labelled B.

Additionally there is a Yellow and Black power cable connected to the fader control card on the port labelled P.

 Disconnect the three cables from the monitor control card (MN6245) as shown in figure 16.

There are two RJ45 (Ethernet) connectors, labelled A and B on the PCB. The green cable connects to the port labelled A; the beige cable connects to the port labelled B.

Additionally there is a Yellow and Black power cable connected to the monitor control card on the port labelled P.



Figure 14





 There are two cables connecting the user interface touch display (MU6293) to the main processing engine (UN6244). These are indicated by the red boxes in figures 17 (connected) and 18 (disconnected).

Disconnect these two cables from the main processing engine ports labelled T1 and T2.

To do this, simply pull the cable loom with an even grip about the top of the open loom. It is not necessary to try prise the connector off of the socket.

Note that the T1 connector has two cables to the same connector. Please pull evenly, gripping both cables together (see figure 19).

 There is a cable connecting the USB port on the monitor control card (MN6245) to the main processing engine (UN6244). This is indicated by the yellow box in figures 17 and 18.

Disconnect this cable from the appropriate port on the main processing engine port. This can be either of the ports labelled U1 or U2.

The other cable connected to U1 or U2 is from the USB port mounted on the Brio's front trim and does not need to be removed at this point. It does not matter if these two cables are connected to the opposite ports as each has the same functionality.

9) The upper surface assembly can now be removed.

To remove the upper surface assembly, tilt it up further than the prop position so that the three extruding locking tabs can be released from the slots at the top of the Brio chassis, as shown in figure 20.

Please take care to locate the removed panel carefully, to avoid damage.



Figure 17

Figure 18



Figure 19



Figure 20

5c. REMOVING THE FADER CONTROL CARDS (CY6246)

- **NOTE** To remove a fader control card (CY6242), you must first remove the surface assembly (IU6290 or MU6287), on which it is mounted. To do this, please refer to sections <u>5a</u> and <u>5b</u>.
- Remove the rotary knobs (341-118), from the twelve rotary encoders on the fader control card (CY6242) to be removed.

The knobs are removed by simply pulling them upwards, as shown in figure 21.

 Remove the fader knobs (704-094), from the twelve faders on the fader control card (CY6242) to be removed.

Again, the fader knobs are removed by simply pulling them upwards.

3) Ensure that the removed surface assembly is positioned with the underside facing upwards, with the PCBs visible.

Ideally, place the assembly on a soft material and avoid movement of the panel in order to avoid causing damage.

- Disconnect the cables between the twelve faders (430-444) and the fader control card (CY6242) that is to be removed, as shown in figure 22.
- 5) There are sixteen M3x6 pan head screws (350-541) that secure the fader control card (CY6242) to the surface assembly.

These screws are located in three rows, as highlighted by the yellow boxes in figure 23.

Remove them using an M3 pozi screwdriver.

6) The fader control card (CY6242) can now be gently lifted and separated from the surface assembly. Once removed, flip the card face up as shown in figure 24

Take care, as the two keymats (704-091), two light blockers (704-093) and twelve mini TFT displays (200-309) can easily become unseated from the fader control card.



Figure 21



Figure 22



Figure 23



Figure 24

- If also replacing a fader, please now refer to section 6, "<u>Replacing a fader</u>".
- If replacing a rotary encoder, please now refer to section 8, "<u>Replacing rotary encoders</u>".
- If replacing a mini TFT display, please now refer to section 9, "<u>Replacing a mini-display</u>".
- If replacing the entire fader control card (CY6242) PCB, next remove the two black light blockers (figure 25) that sit on top of the two keymats (figure 26).

These simply lift upwards over the S1 and S2 buttons.

 Before removing the keymats, it is necessary to first disconnect all twelve mini TFT displays (figure 27).

Failure to do this, will cause damage to the mini TFT display's ribbons, and possibly the connector sockets on the fader control card (CY6242) itself, meaning that they cannot be reused.

When disconnecting the mini TFT displays, please refer to section 8, "<u>Replacing a mini-display</u>", steps 2 and 3.

12) When re-fitting a fader control card (CY6242), take great care to ensure that all mini TFT displays are well seated and all buttons on the keymat pass cleanly through the button holes on the surface assembly.

When disconnecting the mini TFT displays, please refer to section 8, "<u>Replacing a mini-display</u>", steps 4 and 5.

It is recommended that the fader control card is initially held in place with just a couple of loose screws while all buttons are inspected to ensure none are caught against the metalwork

Finally hand tighten all sixteen screws and continue by following the above steps in reverse.







Figure 26



Figure 27



5d. REMOVING THE USER INTERFACE / TOUCHSCREEN DISPLAY (MU6293)

- **NOTE** To remove the user interface / touchscreen display (MU6293), you must first remove the both the lower and upper surface assemblies (IU6290 or MU6287). To do this, please refer to sections <u>5a</u> and <u>5b</u>.
- The rear of the user interface / touchscreen display (MU6293) has four M3x6 pozi screws (350-672), highlighted in red in figure 29.

Remove these screws with an M3 pozi screwdriver.

 The three cables that connect to the rear of the TFT display lead to the main processing engine card (UN6244) T1 and T2 ports.

These were disconnected in section <u>5b</u>, step 7, so do not need to be removed from the rear of the user interface / touchscreen display (MU6293).

- The user interface / touchscreen display (MU6293) can now be lifted from the upper surface assembly
- Rather than replacing the complete user interface / touchscreen display (MU6293) sub-assembly, it may be possible to only replace the TFT touchscreen (201-019)

In this instance, it will be necessary to cut the three cable ties (highlighted by red boxes in figure 30) and detach the stick on cable tie mounts (330-198) in order to disconnect and transfer the three cables to the replacement display.

It is important to fit new cable ties (330-137) to the replacement display (and new cable tie mounts if required).



Figure 29



Figure 30

5e. REMOVING THE MONITOR CONTROL CARD (MN6245)

- **NOTE** To remove the monitor control card (MN6245), you must first remove both the lower and upper surface assemblies (IU6290 or MU6287). To do this, please refer to sections <u>5a</u> and <u>5b</u>.
- 1) Remove the rotary knobs from the ten rotary encoders on the monitor control card (MN6245)

The knobs are removed by simply pulling them upwards, as shown in figure 31.

 Ensure that the upper surface assembly (MU6287) is positioned with the underside facing upwards, with the PCBs visible.

Ideally, place the assembly on a soft material and avoid movement of the panel in order to avoid causing damage.

3) There are ten M3x6 pan head screws (350-541) that secure the monitor control card (MN6245) to the upper surface assembly.

These screws are located in three rows, as highlighted by the red boxes in figure 32.

Remove them using an M3 pozi screwdriver.

4) The monitor control card (MN6245) can now be gently lifted and separated from the upper surface assembly.

Once removed, flip the card face up as in figure 33.

Take care, as the keymat (704-092, fig 34) and light blockers (748-095 and 748-096, fig 35) can easily become unseated from the monitor control card.

- 5) If replacing a rotary encoder, please now refer to section 8, "<u>Replacing rotary encoders</u>".
- 6) When re-fitting the monitor control card (MN6245), take great care to ensure that all buttons on the keymat pass cleanly through the button holes on the upper surface assembly.

It is recommended that the monitor control card is initially held in place with just a couple of loose screws while all buttons are inspected to ensure none are caught against the metalwork



Figure 31



Figure 32



Figure 33



Figure 34



Figure 35

5f. REMOVING THE INTERNAL IO CARDS (JI6241)

- **NOTE** To remove either of the two internal IO cards (JI6241), you must first remove the lower surface assembly (IU6290). To do this, please refer to section <u>5a</u>. It is not necessary to remove the upper surface assembly (MU6287), however it is necessary to carry out section <u>5b</u>, steps 1 through 4 in order to lift the upper surface assembly onto its prop.
- In order to access the lower of the two internal IO cards (JI6241), it is necessary to first remove the upper internal IO card.
- Disconnect the blue RJ45 (Ethernet) cable from the internal IO card port labelled F, highlighted red in figure 36.

If the lower internal IO card (JI6241) is also to be removed, it is recommended that the RJ45 cables are labelled with a permanent marker in order to ensure that they are reconnected to the appropriate card later. Incorrect connections will affect operation.

- Disconnect the power cable from the internal IO card port labelled Q, highlighted yellow in figure 36.
- 4) Remove the four M3x6 pan heads screws (350-541), which are highlighted by the red boxes in figure 37.
- The upper internal IO card (JI6241) can now be removed by gently pulling it forward. This will disconnect it from the connectors on the rear interface cards (SN6242 and SN6243), highlighted by yellow boxes in figure 37.
- 6) To remove the lower internal IO card, repeat steps 2 to 5.

Note that the lower of the two internal IO cards (JI6241) also has a headphone and talkback mic amp sub-card (PT6252) fitted. The position of this sub-card is highlighted in red in figure 38.

The procedure for removing this sub-card is described in the following section, 5g.



Figure 36



Figure 37



Figure 38

 When re-fitting internal IO cards, it is important that the headphone and talkback mic amp subcard (PT6252) is fitted to the lower internal IO card (JI6241).

If the headphone and talkback mic amp sub-card is accidentally fitted to the upper internal IO card, it is possible for the upper surface assembly to catch on the sub-card.

 When re-connecting the blue RJ45 (Ethernet) cables to the internal IO card ports labelled F, it is important that the upper card is connected to the F1 port on the main processing engine card (UN6244), highlighted red in figure 39.

Similarly, the lower card must be connected to the F2 port on the main processing engine card (UN6244), highlighted yellow in figure 39.

Failure to observe this will result in the first half of all input and output ports being reversed with the second half.

The power cables are interchangeable.

 If installing a replacement internal IO card (JI6241), upon the next power cycle of the console, the Brio will interrogate the IO card to ensure that the card's software and firmware matches that of the console.

In the case of a version mismatch, the Brio will automatically reprogram the newly installed internal IO card to the compatible version. In such instance, the Brio UI will display the blue System Reprogramming icon on the Notification Bar.

Clicking on this will display the current progress, as shown in figure 40.



Figure 39



Figure 40



5g. REMOVING THE HEADPHONE & TALKABCK MIC AMP CARD (PT6252)

NOTE To remove the headphone and talkback mic amp card (**PT6252**), you must first remove the lower surface assembly (**IU6290**). To do this, please refer to section <u>5a</u>. It is not necessary to remove the upper surface assembly (**MU6287**), however it is necessary to carry out section <u>5b</u>, steps 1 through 4 in order to lift the upper surface assembly onto its prop.

It is possible to remove the HP/TB sub-card from the lower internal IO card (JI6241) without first removing the upper internal IO card, but this is NOT recommended. Please refer to section 5f in order to remove the upper IO card.

1) Disconnect the two cables from the headphone and talkback mic amp card (PT6252).

These cables can be seen in figure 41.

The upper cable (highlighted red) is the headphone output to the headphone jack socket mounted on the lower front of the chassis

The lower cable (highlighted yellow) is the talkback mic connection to the monitor control card (MN6245).

 The headphone and talkback mic amp card (PT6252) can be gently lifted from the lower internal IO card (JI6241). See figure 42.

NOTE – Take great care when removing the HP/TB card (**PT6252**). The sub-card's connecting pins can bend easily. Gently remove it in a single upwards movement, to avoid bending any of the pins.

 When re-fitting the HP/TB card (PT6252), it is important that it is connected to the lower internal IO card (JI6241).

If the HP/TB card is accidentally fitted to the upper internal IO card, it is possible for the upper surface assembly to catch on the sub-card.



Figure 41



Figure 42

5h) REMOVING THE XLR INTERFACE CARDS (SN6243)

NOTE To remove an XLR interface card (SN6243), you must first remove the lower surface assembly (IU6290). To do this, please refer to section 5a. It is not necessary to remove the upper surface assembly (MU6287), however it is necessary to carry out section 5b, steps 1 through 4 in order to lift the upper surface assembly onto its prop.

It is necessary to remove at least the upper internal IO card (JI6241), if not also the lower internal IO card first. Please refer to section 5f to remove the internal IO cards.

- 1) Remove any external connections (XLRs) from the rear of the console.
- Once the relevant internal IO card (JI6241) has been removed, the black self-tapping screws (350-673) should be removed using an M3 pozi screw driver.

The red boxes in figure 43 indicate the twenty fixing screw for the upper interface card, and the blue boxes the lower interface card.

3) With all the screws removed, the XLR interface card (SN6243) can now be removed.



Figure 43

5i. REMOVING THE BNC / GPIO INTERFACE CARDS (SN6242)

NOTE To remove a BNC / GPIO interface card (SN6242), you must first remove the lower surface assembly (IU6290). To do this, please refer to section <u>5a</u>. It is not necessary to remove the upper surface assembly (MU6287), however it is necessary to carry out section <u>5b</u>, steps 1 through 4 in order to lift the upper surface assembly onto its prop.

It is necessary to remove at least the upper internal IO card (JI6241), if not also the lower internal IO card first. Please refer to section <u>5f</u> to remove the internal IO cards.

- 1) Remove any external connections (BNC and Dtype connectors) from the rear of the console.
- Once the relevant internal IO card (JI6241) has been removed, the four M3x6 pan head screws (350-541) on the inside of the chassis can be removed with an M3 pozi screw driver.

These screws are highlighted red in figure 44.

Note that it is NOT necessary to remove the Dtype connector 'jack posts' from the rear of the console, as they are attached to the BNC / GPIO interface card (SN6242) itself and not the Brio's chassis.

3) With all the screws removed, the BNC / GPIO interface card (SN6242) can now be removed.



Figure 44

5j. REMOVING THE EXPANSION IO BACKPLANE (HN6248)

- **NOTE** To remove the expansion IO backplane (**HN6248**), you must first remove the lower surface assembly (**IU6290**). To do this, please refer to section <u>5a</u>. It is not necessary to remove the upper surface assembly (**MU6287**), however it is necessary to carry out section <u>5b</u>, steps 1 through 4 in order to lift the upper surface assembly onto its prop.
- It is necessary to remove any IO expansion cards, from the rear expansion slots before proceeding.

Make a note of any expansion IO cards including the card type and its slot position (ie: position C, D or E).

It is important that these cards are later returned to the same expansion slots otherwise the IO configuration of the console will change.

2) To remove an expansion IO card, unscrew the captive screws on the card, then grasp the screws and pull to release the card.

These captive screws are shown in figure 45.

It is NOT necessary to remove any blanking panels (NN5866).

It should be possible to remove the expansion IO cards without a screwdriver. However if the screws are too tight, a flat bladed screw driver will be required.

When re-fitting expansion IO cards, a screwdriver is NOT recommended.

 Disconnect the three blue RJ45 (Ethernet) cables from the C1, C2 and C3 ports on the expansion IO backplane, highlighted red in figure 46.

It is highly recommended that the RJ45 cables are labelled in order to ensure that they are reconnected to the appropriate port. Incorrect connections will affect operation.

4) Disconnect the power cable from the port labelled Q, highlighted yellow in figure 46.



Figure 45



Figure 46



5) The six M3x6 pan head screws (350-541) can be removed with an M3 pozi screw driver.

These screws are highlighted red in figure 47.

- 6) The expansion IO backplane (HN6248) can now be removed.
- When re-connecting cables to the expansion IO backplane (HN6248), it is important that the RJ45 (Ethernet) cables are re-connected in the correct order, otherwise expansion IO will not appear in the correct slots.

The port labelled C1 must be connected to the C1 port on the main processing engine card (UN6244), highlighted red in figure 48.

The port labelled C2 must be connected to the C2 port on the main processing engine card (UN6244), highlighted yellow in figure 48.

The port labelled C3 must be connected to the C3 port on the main processing engine card (UN6244), highlighted green in figure 48.



Figure 47



Figure 48

5k. REMOVING THE MAIN PROCESSING ENGINE CARD (UN6244)

IMPORTANT The main processing engine card (**UN6244**) contains all the system configuration files that are unique to a particular Brio console, plus all user data (including show files).

It is recommended that all user data is backed up from the console before proceeding. Please see <u>Section 4 "Backing up user data"</u> for more details.

If replacing the main processing engine card, it will be necessary to restore this user data to the new card.

- **NOTE** To remove the main processing engine (**UN6244**), you must first remove the lower surface assembly (**IU6290**). To do this, please refer to section <u>5a</u>. It is not necessary to remove the upper surface assembly (**MU6287**), however it is necessary to carry out section <u>5b</u>, steps 1 through 4 in order to lift the upper surface assembly onto its prop.
- Disconnect any Sync inputs, Hydra2 connections (including any SFPs), DVI connectors or RJ45 (Ethernet) connections that may be connected to the rear of the console before continuing (fig 49).
- 2) Remove all internal connections to the main processing engine (UN6244). These include:
 - 4x green RJ45 (Ethernet) cables; disconnect from ports A1-A4 These cables carry data to and from the monitor control card (MN6245) and three fader control cards (CY6246)
 - 4x beige RJ45 (Ethernet) cables; disconnect from ports B1-B4 These cables carry data to and from the monitor control card (MN6245) and three fader control cards (CY6246)
 - 5x blue RJ45 (Ethernet) cables; disconnect from ports F1-F2 and C1-C3 These cables carry data to and from each of the internal IO cards (JI6241) and to each of the three expansion slots on the expansion IO backplane (HN6248)
 - 2x USB cables; disconnect from ports U1 and U2 These carry USB power and data to the two USB ports; one located on the monitor control card (MN6245); the other on the lower front of the chassis
 - 2x user interface / touchscreen display; disconnect from ports T1 and T2 These carry power and data to and from the user interface touch display (MU6293)



Figure 49



Figure 50

- 2x power cables; disconnect from ports K and PE These carry power from, plus power status monitoring to and from the power monitoring and distribution card (ZN6247)
- 1x fan power cable; disconnect from port N1 This provides power to and monitors the status of the chassis cooling fan (330-865)

It is highly recommended that the RJ45 cables are labelled in order to ensure that they are reconnected to the appropriate port. Incorrect connections will affect operation.

 Remove the two M3x6 pan head screws (350-541) that fix the front of the main processing engine (UN6244) to the base of the chassis, using an M3 pozi screwdriver.

These screws are indicated by the red boxes, at the front of the card in figure 51.

 Loosen, but do NOT remove the two M4 nuts (360-124) that secure the main processing engine card to the rear of the chassis, using a nut runner / spinner / socket.

The two nuts are indicated by the yellow boxes, at the rear of the card in figure 51.

5) The five M2x10.9 pozi screws (350-652) indicated by the blue boxes on figure 51 should NOT be removed as these secure the PCB to the complete processing engine, which includes the metalwork.

Likewise, it is NOT necessary to remove any fixings from the rear of the main processing engine card (figure 52) as the metalwork, to which these connectors are attached, will be removed with the circuit board as part of the complete main processing engine card (UN6244).

6) The main processing engine card (UN6244) can now be removed by lifting it slightly to allow the rear holes to pass over the loosened M4 nuts on the rear of the chassis.



Figure 51



Figure 52



 If a Hydra2 option card (US6249) is fitted to the Brio, it should be removed from the main processing engine card (UN6244) and transferred to the replacement engine card.

The Hydra2 option card (**US6249**) is shown in figure 53 and interfaces with the main processing engine card (**UN6244**) via a standard DIMM-2 socket, labelled H2M. See section <u>51</u> for more details.

8) When re-fitting a main processing engine card (UN6244), be sure not to catch any cables under the board and make sure that the board is flush with the rear of the console once slotted over the loosened M4 nuts

It is important that all RJ45 (Ethernet) cables are re-connected back to the same ports, otherwise console operation will be affected.

As a reminder, a diagram showing the necessary panel connections is displayed on the internal of the chassis in the lower section.

As shown in figure 54, the monitor section is considered to be panel 1, followed by the remaining fader sections in incremental number order.

 If installing a replacement main processing engine card (UN6244), it should be noted that the software for the whole console is contained on this card.

Upon the next power cycle of the console, the current software version should be verified from the "System Settings -> Software" page (figure 55) and a software upgrade carried out if necessary.

 Additionally the main processing engine card (UN6244) contains all user data associated with the console. Following the replacement of the main processing engine card, user data should be restored using the Brio Atomic Updater (figure 56).

The backup procedure is detailed in <u>Section 4</u> <u>"Backing up user data"</u>.

The restore procedure is identical for steps 1 to 6, then in step 7, click on the "Restore" button, then navigate to the location of your saved user data.



Figure 53



Figure 54



Figure 55



Figure 56

5I. REMOVING THE HYDRA2 OPTIONS CARD (US6249)

NOTE Not all Brio consoles have a Hydra2 options card (**US6249**) fitted. This will depend upon the original console purchase.

When a Hydra2 options card is present, if it becomes necessary to replace the main processing engine card (UN6244), it will also be necessary to remove the Hydra2 options card from the old / faulty main processing engine card and transfer it to the replacement main processing engine card.

- **NOTE** To remove the Hydra2 options card (**US6249**), you must first remove the lower surface assembly (**IU6290**). To do this, please refer to section <u>5a</u>. It is not necessary to remove the upper surface assembly (**MU6287**), however it is necessary to carry out section <u>5b</u>, steps 1 through 4 in order to lift the upper surface assembly onto its prop.
- The Hydra2 options card (US6249) is located towards the top of the main processing engine card (UN6244), indicated by the red box to the right of the GUI processor in figure 57.

The Hydra2 option card (**US6249**) interfaces with the main processing engine card (**UN6244**) via a standard DIMM-2 socket, labelled H2M and is held in place by a pair of metal retaining clips.

2) To remove the Hydra2 option card (US6249), see figure 58:

Gently full back the two retaining clips (1).

Once released, the card will naturally rise up to an angle of approx. 25 degrees (2).

The card can then be extracted by gently pulling away from the connector (3).

3) To re-fit the Hydra2 option card (US6249), see figure 58:

Gently mate the card into the connector at an angle of approx. 25 degrees (4).

Push gently until the card feels firm against the connector (5). You should not see the gold pins protruding from the connector. This is likely if trying to connect at a steeper angle.

Rotate (push) the card flat (6) and the locks (7) should click into place.



Figure 57



Figure 58

5m. REMOVING THE POWER DISTRIBUTION CARD (ZN6247)

- **NOTE** To remove the power monitoring and distribution card (**ZN6247**), you must first remove the lower surface assembly (**IU6290**). To do this, please refer to section <u>5a</u>. It is not necessary to remove the upper surface assembly (**MU6287**), however it is necessary to carry out section <u>5b</u>, steps 1 through 4 in order to lift the upper surface assembly onto its prop.
- Remove all internal connections to the power monitoring and distribution card (ZN6247). These include:
 - 4x yellow/black 2-pin molex cables; disconnect from the ports labelled P These cables provide 12v power to each of the three fader control cards (CY6246) and the monitor control card (MN6245)
 - 3x yellow/black/red/black 4-pin molex cables; disconnect from the ports labelled Q These cables provide 12v power, plus separate 48v phantom power to each of the internal IO cards (JI6241) and the expansion IO backplane (HN6248)
 - 2x yellow/black 12-pin molex cables; disconnect from the ports labelled Upper and Lower

These cables provide the individual 12v supplies from the two power supply units (ZN6292)

- 1x yellow/black 2-pin molex cable; disconnect from the port labelled PE This cable provides 12v power to the main processing engine card (UN6244)
- 1x ribbon cable; disconnect from the port labelled K This cable carries status and power monitoring data to and from the main processing engine card (UN6244)

These cables can be seen in figure 59.

2) Remove the six M3x6 pan head screws (350-541) with an M3 pozi screw driver.

The screws are highlighted yellow in figure 59

 When re-connecting the cables to the power monitoring and distribution card (ZN6247), any Q and P ports can connect to any panel, however, the upper and lower ports must go to the upper and lower power supply units (ZN6292), respectively.



Figure 59

5n. REMOVING THE POWER SUPPLY UNITS (ZN6292)

- NOTE To remove a PSU (ZN6292), you must first remove the lower surface assembly (IU6290). To do this, please refer to section <u>5a</u>. It is not necessary to remove the upper surface assembly (MU6287), however it is necessary to carry out section <u>5b</u>, steps 1 through 4 in order to lift the upper surface assembly onto its prop.
- Never attempt to touch the internal power supplies without first removing both mains input cables (IEC) from the rear of the console.
- There are two identical power supply units mounted one on top of the other. In order to remove the lower power supply, it is necessary to first remove the upper power supply (steps 3 to 9).
- 3) In order to access the upper power supply, first remove the cover plate.

Loosen, but do NOT remove the two M4 nuts (360-010) on the rear of the chassis using a nut runner / spinner.

These nuts are highlighted red in figure 60.

 Remove the two M3x6 pan head screws (350-541) from the top of the cover plate with an M3 pozi screw driver.

These screws are highlighted yellow in figure 60.

- 5) The cover plate (723-452) can now be removed by gently lifting over the loosened nuts, then sliding forward.
- 6) Disconnect the two molex cables from the upper power supply unit (ZN6292).

These cables pass the 12v power to the power monitoring and distribution card (ZN6247). The yellow cable is positive (+), the black cable is negative (-)

 Loosen, but do NOT remove the two M4 nuts on the rear of the chassis using a nutter runner / spinner.

These nuts are highlighted red in figure 61.



Figure 60





8) Remove the two M3x6 pan head screws from the upper power supply unit with an M3 pozi screw driver.

These screws are highlighted yellow in figure 61.

- 9) The upper power supply unit (ZN6292) as a whole (including the containing cage) can now be removed by gently lifting over the loosened M4 nuts, then sliding forward.
- 10) If removing the lower power supply, continue with steps 11 to 14.
- 11) Disconnect the two molex cables from the lower power supply unit (ZN6292).
- 12) Loosen, but do NOT remove the two M4 nuts on the rear of the chassis using a nutter runner / spinner.

These nuts are highlighted red in figure 62.

13) Remove the two M3x6 pan head screws from the lower power supply unit with an M3 pozi screw driver.

These screws are highlighted yellow in figure 63.

- 14) The upper power supply unit (**ZN6292**) as a whole (including the containing cage) can now be removed by gently lifting over the loosened M4 nuts, then sliding forward.
- 15) It is not necessary to separate the power supply circuit board (250-111) from the metal bracket (636-236). If you are fitting a replacement power supply unit, the new unit will be supplied with the bracket already attached.
- 16) When re-fitting either power supply unit, it is vital that the yellow cables (positive) are connected to the left sockets, with the black cables (negative) connected to the right sockets, as shown in figure 63.



Figure 62



Figure 63

6. REPLACING A FADER

NOTE To replace a fader (Calrec part # 430-444) on the lower surface assembly (faders 1 to 24), it is not necessary to remove the lower fader assembly (**IU6290**), however it is necessary to carry out section <u>5a</u>, steps 1 through 4 in order to lift the lower surface assembly onto its prop.

To replace a fader (430-444) on the upper fader assembly (faders 25 to 36), you must first remove the lower surface assembly (IU6290). To do this, please refer to section <u>5a</u>. It is not necessary to remove the upper surface assembly (IU6287), however it is necessary to carry out section <u>5b</u>, steps 1 through 4 in order to lift the upper surface assembly onto its prop.

 Each fader has a connector that connects to the adjacent socket on one of the three fader control cards (CY6242) on the underside of the assembly.

Unplug the connector for the fader to be removed, as shown in figure 64.

- 2) Remove the fader knob (704-094) from the fader to be replaced by lifting gently upwards.
- Remove the two M3x6 countersunk screws (350-611) from directly above and below the fader that is to be removed with an M3 pozi screw driver.

These screws are highlighted red in figure 65.

Take care when removing the second screw, as the fader will be released then be free to drop into the mixer frame.

- If trying to diagnose a possible fault with a fader, it is possible to disconnect the two faders and cross their connections to see if the fault follows the physical fader.
- 5) When re-fitting a fader, be sure that the fader moves cleanly and the metal contact does not catch the metalwork on either side of the fader track.
- After replacing a fader, the fader calibration procedure must be carried out. This is detailed in <u>section 7</u>, below.



Figure 64



Figure 65



7. FADER CALIBRATION

 Fader Calibration controls are accessed via the Brio console's diagnostic mode. This is accessible only from a full power cycle (not a surface or GUI reset).

As such, if the console is currently powered, first power off the console by switching off the mains supply or removing both IEC cables from the rear of the console.

 Apply power to the console, then press and hold down the G1, G2 and G3 Global User Buttons in the Access Display Area bellow the user interface / touchscreen display (MU6293).

These buttons are highlighted red in figure 66.

Keep these buttons held until the touch screen display shows the text "Boot press keys read: 273". These keys can now be released. The console is now in diagnostic mode.

3) The mini-TFT displays above the first bank of faders will now display several options.

Select "Fader Tools" by pressing the S1 button on the third fader channel (red in figure 67)

4) The mini-TFT displays will now update.

Select "Calibrate" by pressing the S1 button on the first fader channel (yellow in figure 67).

All faders will now move to the 0dB line-up position. Visually inspect the position of the faders relative to the 0dB line-up position.

Note that if recalibrating a single fader, it is necessary to re-calibrate all 36 faders. Any newly fitted faders must be calibrated before use.

5) The mini-TFT displays will update again.

Select "Calibrate" by pressing the S2 button on the first fader channel (green in figure 67). This will begin the calibration procedure.



Figure 66



Figure 67

 Move all the faders to the negative infinity / off (-∞dB) position.

Note that this is not the lowest possible position, but the lowest marking on the fader scale.

7) Once complete, press S2 on the first fader (green in figure 67), to move to the next step.

Each fader's mini-TFT display should display "OK" in green text to confirm that the low position is configured and acceptable. If any faders do not display OK, they should be recalibrated before continuing. Faders that will not calibrate could be faulty and should be replaced.

- 8) Move all faders to the line-up position (0dB).
- 9) Once complete, press S2 on the first fader (green in figure 67), to move to the next step.

Each fader's mini-TFT display should display "OK" in green text to confirm that the line-up position is configured and acceptable. If any faders do not display OK, they should be recalibrated before continuing. Faders that will not calibrate could be faulty and should be replaced.

10) Move all faders to the +10dB position.

Note that this is not the highest possible position, but the highest marking on the fader scale.

11) Once complete, press S2 on the first fader(green in figure 67), to move to complete the calibration procedure.

Each fader's mini-TFT display should display "complete" in green text to confirm that the +10dB position is configured and acceptable, and the calibration procedure is now complete.

 To exit diagnostic mode and return to normal operation, simply press the recessed reset button located on the monitor control card (MN6245) between the PFL level control knob and the USB socket.

This button is highlighted blue in figure 66.

8. REPLACING A ROTARY ENCODER

- **NOTE** To replace a rotary encoder (230-795, with switch; or 230-796, without switch) it is necessary to remove the appropriate fader control card (CY6242) or monitor control card (MN6245) by following the instructions in section <u>5c</u> or <u>5e</u> respectively.
- 1) De-solder the seven joints shown in figure 68.

The five smaller joints are the conductive pins that pass data between the rotary encoder and the PCB.

The two larger joints support the body of the rotary encoder and are mounting points only.

- 2) As a precaution against damaging the PCB, use wire cutters to carefully cut the five conductive pins from the rotary encoder, on the component side as shown in figure 69.
- De-soldier the two large pins, then remove the faulty rotary encoder. Be careful of the sharp edges of the five cut conductive pins that are still soldiered to the PCB.
- With the rotary encoder removed, the five conducting pins can be de-soldered individually. Once all pins have been removed, hold the PCB up to the light, to verify that all seven holes are completely clear.
- 5) The replacement rotary encoder can now be fitted.

Please make sure the correct type of replacement part is fitted. There are two types of rotary encoder used in the Brio console.

One has a built in push switch (230-795) and is used for all rotary encoders with the exception of the "Main Monitor" and "PFL" controls on the monitor control card (MN6245). These two controls do not feature a push switch (230-796).

 Ensure that the orientation of the rotary encoder is correct; the body of the device is flat to the PCB; and all pins are visible on the solder side.



Figure 68



Figure 69

- Before soldering any of the five conductive pins, first solder one of the two large joints in order to secure the device in place.
- 8) Again, ensure that the body of the device is flat to the PCB and all pins are visible on the solder side.

At this point it is possible to again de-soldier the large joint if the position of the rotary encoder needs to be adjusted.

- 9) Once happy that the mounting of the rotary encoder is correct, proceed to solder the 5 conductive pins, then the remaining large joint.
- The fader control card (CY6242) or monitor control card (MN6245) can now be refit into the console by following the instructions in section <u>5c</u> or <u>5e</u> respectively.

9. REPLACING A MINI TFT DISPLAY

- **NOTE** To replace a mini TFT display (200-309) it is necessary to remove the appropriate fader control card (CY6242) by following the instructions in section <u>5c</u>.
- The mini TFT displays are relatively fragile, so care should be taken when handling. Be careful not to apply pressure to the cable or the screen. If the display is accidentally touched, finger prints can be removed with an anti-static cloth.
- The mini TDT displays are seated on keymats (704-091). Behind each display is a slot that allows the flat cable of the TFT display to pass through both the keymat and the fader control card (CY6242). This cable then connects to a socket mounted on the rear of the fader control card.
- Each connector on the rear of the fader control card (CY6242) has a retainer. To unlock this retainer, it should be gently lifted upwards, away from the PCB. The cable can now be released from the retainer.

The retainer will **not** fully separate from the base of the connector and only needs to be lifted approx. 2mm.

The connector is shown in figure 70.

- 4) With the cable disconnected, carefully remove the display, from its rubber keymat, and gently pull the cable through the slot, as shown in figure 71.
- 5) When fitting the replacement display, ensure that the cable is fully inserted and mounted straight before gently pushing the retainer down into the locked position.
- The mini TFT displays should be seated flat in the black surrounds before reattaching the fader control card (CY6242) to the surface assembly
- The fader control card (CY6242) can now be refit into the console by following the instructions in section <u>5c</u>.



Figure 70



Figure 71

10. REPLACING THE COOLING FAN

- NOTE To replace the cooling fan (330-865), you must first remove the lower surface assembly (IU6290). To do this, please refer to section 5a. It is not necessary to remove the upper surface assembly (MU6287), however it is necessary to carry out section 5b, steps 1 through 4 in order to lift the upper surface assembly onto its prop.
- Disconnect the fan power cable from the main processing engine (UN6244). This connector is labelled N1 and is indicated in red in figure 72.
- There are four No10x1/2" self-tapping screws (350-581) on the rear of the console chassis. These hold in place both the fan (330-865) on the inside of the chassis, and the fan guard (330-875) on the outside of the chassis.

These screws are indicated by the red boxes in figure 73.

3) Remove these four screws using an M4 pozi screw driver.

Take care, when the screws have been removed, as both the fan and fan guard will be free to fall.

- The fan can now be replaced, the fan guard re-fit, with both screwed back into place with the selftapping screws.
- 5) When fitting the replacement fan, ensure it is the correct orientation and polarity. The fan is designed to push hot air out of the rear of the console. Cold air will therefore be drawn into the console from the vents in the side trim.
- 6) Take care not to over tighten the self-tapping screws, when fitting the replacement fan. The screws form a thread in the plastic body of the fan. If the screws are over tightened, the fan will need to be replaced, again.
- 7) Reconnect the fan power cable to the N1 port on the main processing engine (UN6244).

Note that this power cables is a loom of 4 cables: pin 1 = blue; pin 2 = red; pin3 = white; pin 4 = purple



Figure 72



Figure 73

11. INSTALLING A HYDRA2 OPTIONS CARD (US6249)

Brio consoles can be purchased with or without a Hydra2 options card (US6249) fitted. This will depend upon the original customer requirements. The presence of a Hydra2 options card enables the two SFP ports on the rear of the Brio chassis.

Without this card, these SFP ports will be unresponsive, but with this card installed, these ports can be used to connect to either:

- A single IO box;
- A number of IO boxes via a H2Hub (no limit to the number of boxes, but the number of physical ports is limited to 512 inputs and 512 outputs)
- Another (non-Brio) Calrec console (Apollo, Artemis, Summa or Router Core), providing managed access to all IO resources connected to all networked consoles

If not installed as part of the initial console purchase, the Hydra2 options card be retroactively installed by the user a later date.

 The Hydra2 option card (US6249) interfaces with the main processing engine card (UN6244), via a standard DIMM-2 socket, labelled H2M and indicated by the red box in figure 74.

To access the main processing engine card (UN6244), you must first remove the lower surface assembly (IU6290). To do this, please refer to section 5a. It is not necessary to remove the upper surface assembly (MU6287), however it is necessary to carry out section 5b, steps 1 through 4 in order to lift the upper surface assembly onto its prop.

2) To fit the Hydra2 option card (US6249), see figure 75:

Gently mate the card into the connector at an angle of approx. 25 degrees (1).

Push gently until the card feels firm against the connector (2). You should not see the gold pins protruding from the connector. This is likely if trying to connect at a steeper angle.

Rotate (push) the card flat (3) and the locks (4) should click into place.







12. INTERNAL WIRING





13. USEFUL PART NUMBERS

The below table is a list of parts that make up the Brio console. These parts are organised by level.

Depending on the nature of the fault, it may be more logical or simple to replace a sub-assembly rather than an individual component. Conversely, for consoles out of warranty, it may be more cost effective to replace a component rather than a complete sub-assembly.

When ordering or requesting replacement parts, please try to provide the Calrec part numbers of the assembly or component(s) you require.

Level 1 – Main Assemblies

Part number	Description	Serialised?
IU6290	Lower surface assembly	Yes
MU6287	Upper surface assembly	Yes

Level 2 – Sub Assemblies

Part Number	Description	Serialised
CY6246	Fader control card	No
HN6248	Expansion IO backplane	No
JI6241	Internal IO card	Yes
MN6245	Monitor control card	No
MU6293	User interface / touchscreen display	No
PT6252	Headphone / talkback mic card	No
SN6242	BNC / GPIO interface card	No
SN6243	XLR interface card	No
UN6244	Main processing engine	Yes
US6249	Hydra option card	Yes
ZN6247	Power distribution card	No
ZN6292	Power Supply Unit	Yes

Level 3 - Component Parts

Part NumberDescriptionUpper and lower surface assembly components430-444Fader assembly (Bourns 100mm fader)704-094Fader knob200-309TFT mini display (96x96 full colour)

- 230-795 Rotary encoder, with switch
- 230-796 Rotary encoder, without switch
- 341-117 Rotary knob (large)
- 341-118 Rotary knob (small)
- 704-091 Keymat (fader)
- 704-092 Keymat (monitor)
- 704-093Light blocker (fader)
- 704-095 Light blocker (monitor left)
- 704-096 Light blocker (monitor right)
- 748-084Light guide

Internal components

330-865	Cooling fan
330-875	Fan guard
250-111	PSU (12v 350W)
723-452	PSU cover plate
636-236	PSU bracket
330-745	Bios battery 3.0v CR2032 lithium (for UN6244)
700-435	Panel prop
330-877	Rubber foot (for upper 700-435)
390-185	Console foot (also for lower 700-435)
390-187	Rear handle

User interface / touchscreen display

- 201-019 TFT touchscreen assembly
- 731-033 TFT bracket (left)
- 731-034 TFT bracket (right)
- 312-318 LVDS Video & backlight cable
- 312-332 Touch and data cable
- 330-198 Cable tie mount (4mm stick on)
- 330-137 Small black nylon cable tie

Internal cables

- 312-247 Cat5e patch cable 0.5m Beige
- 312-322 Cat5e patch cable 0.5m Green
- 312-321 Cat5e patch cable 0.5m Blue
- 312-213 Cat5e patch cable 1.0m Beige
- 312-219 Cat5e patch cable 1.0m Green
- 312-324 Power cable: 12 way (6 black / 6 yellow)
- 312-325 Power cable: 4 way (2 black / red / yellow)
- 312-326 Power cable: 2 way (black / yellow)
- 312-327 Power cable: 2 way (black / yellow)
- 312-328 Power monitor cable: 10 way (ribbon IDC)
- 420-987 Retaining clip (for 312-328)
- 312-329 Talkback mic cable
- 430-443 Talkback microphone (6mm omni)
- 312-295 Headphone cable
- 312-319 USB A to 5-pin cable (750mm)
- 330-771 Velcro cables wraps
- 330-823 Cable clip push type (for rear PSU restraint)
- 330-837 Cable clip adhesive (for panel cable restraint)

Trim

725-999114	Front trim

- 725-999112Side trim left
- 725-999112 Side trim right
- 725-999124 Centre trim
- 330-872High strength tape 12mm x 33mm (for front trim)

ZN6292 to ZN6247 ZN6247 to JI6241 / HN6248 ZN6247 to CY6246 / MN6245 ZN6247 to UN6244 ZN6247 to UN6244



Interface connectors

420-770	BNC connector
420-965	XLR connector male
420-966	XLR connector female
420-972	D-type connector female 9-pin
	Screws, nuts, washers
350-652	M2x10.9 pozi (for UN6244 PCB to metalwork)
350-138	M2.5x6 pozi pan (for prop fixing)
370-038	M2.5 washer spring lock (for prop fixing)
350-633	M2.5 knurled collar screw
350-009	M3x5 pozi pan
350-541	M3x6 pozi pan head with washers (for PCB to assembly)
350-611	M3x6 pozi CSK M/C (fader fixing screws)
350-672	M3x6 pozi with lockwasher (for touchscreen)
350-553	M3x10 CSK hex black (for panels)
360-024	M3 cage nuts (for 350-553)
370-004	M3 washer plain
370-005	M3 washer internal lock
360-113	M3 nylock nut
350-043	M4x10 pozi pan (for side trims)
350-047	M4x16 pozi pan (for front trim)
360-010	M4 nut
360-124	M4 nylock nut
370-008	M4 lock washer (for earth stud and PSUs)
350-113	M6x12 pozi pan (for handles)
370-011	M6 washer (for sync inputs)
360-012	M6 nut hex
350-673	10mm self-tapping black (for XLRs)
350-581	No10x1/2" self-tapping screw (for fan)
370-049	M12 washer (for headphone socket)
	Miscellaneous

- 726-167 Brio 36 dust cover
- NN5866 Expansion IO blanking plates