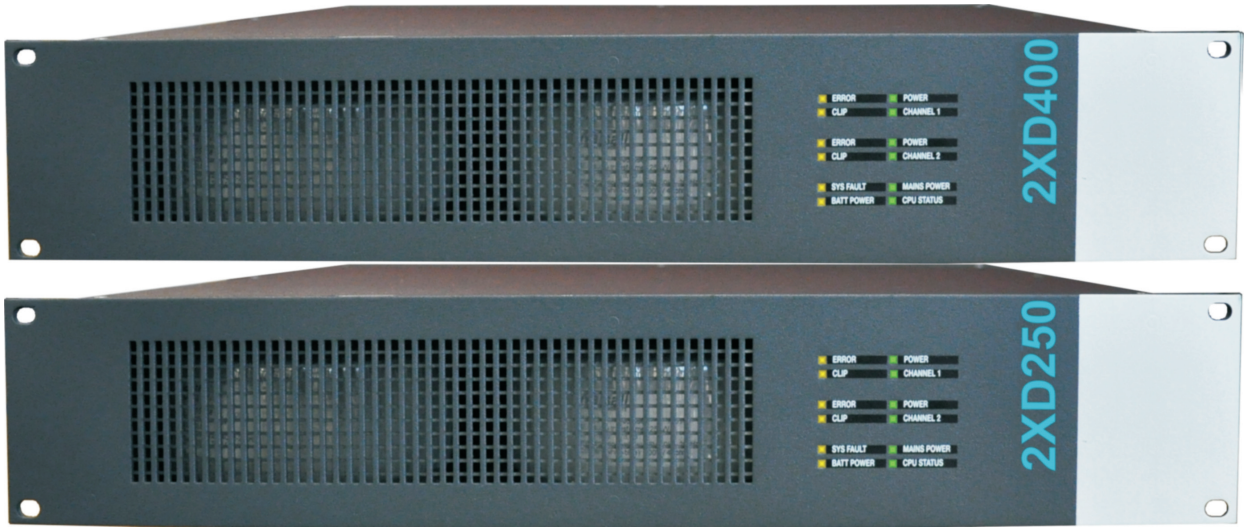
Honeywell

Power up and Troubleshooting guide

Power Amplifiers

2XD400 (580232) and 2XD250 (580231)



Contents

Preface

This is the first issue of the Power up and troubleshooting guide for the Power Amplifiers 2XD400 (580232) and 2XD250 (580231).The guide covers information on preliminary checks, powered up, fault finding and part replacement procedures.

Associated Documents

☐ 4188-976 issue 2 part 1
Power Amplifier - Data Sheet.

Conventions

This is a note to highlight important text that is normally hidden in the main text.

This is either a caution to prevent damage to the equipment or a warning to inform of dangerous conditions that may result in injury or death.

Abbreviations

LED	light-emitting Diode
PA	Public Address
PCB	Printed Circuit Board
PSU	Power Supply
VA	Voice Alarm

Amplifier Power up and troubleshooting process

Here is an overview of checks and tests necessary before and after power up.

Ensure the installation is to site specific requirements and to the relevant standards.

↓

Ensure all parts within the Amplifier unit are securely fitted.

↓

Ensure all the internal cables are connected to their intended sockets.

↓

Ensure that the **transformer cables** are connected to their respective sockets.

↓

Ensure cables of **external circuits** are connected to their designated connectors on the rear panel and where appropriate connector plugs supplied are used for external wiring.

↓

Ensure switches on the rear panel are correctly configured.

↓

Battery polarity must be observed when connecting batteries to the Power Amplifier. **Incorrect connection of batteries to Power Amplifier will result in damage to the system equipment.**

Switch ON the mains power to the Amplifier and then after 30 seconds switch ON the battery power.

↓

Check the software version if required and carry out initial tests.

↓

Resolve any **fault indications** given and ensure the Amplifier is giving a Normal indications.

↓

Carry out tests on the system to project requirements.

Initial checks

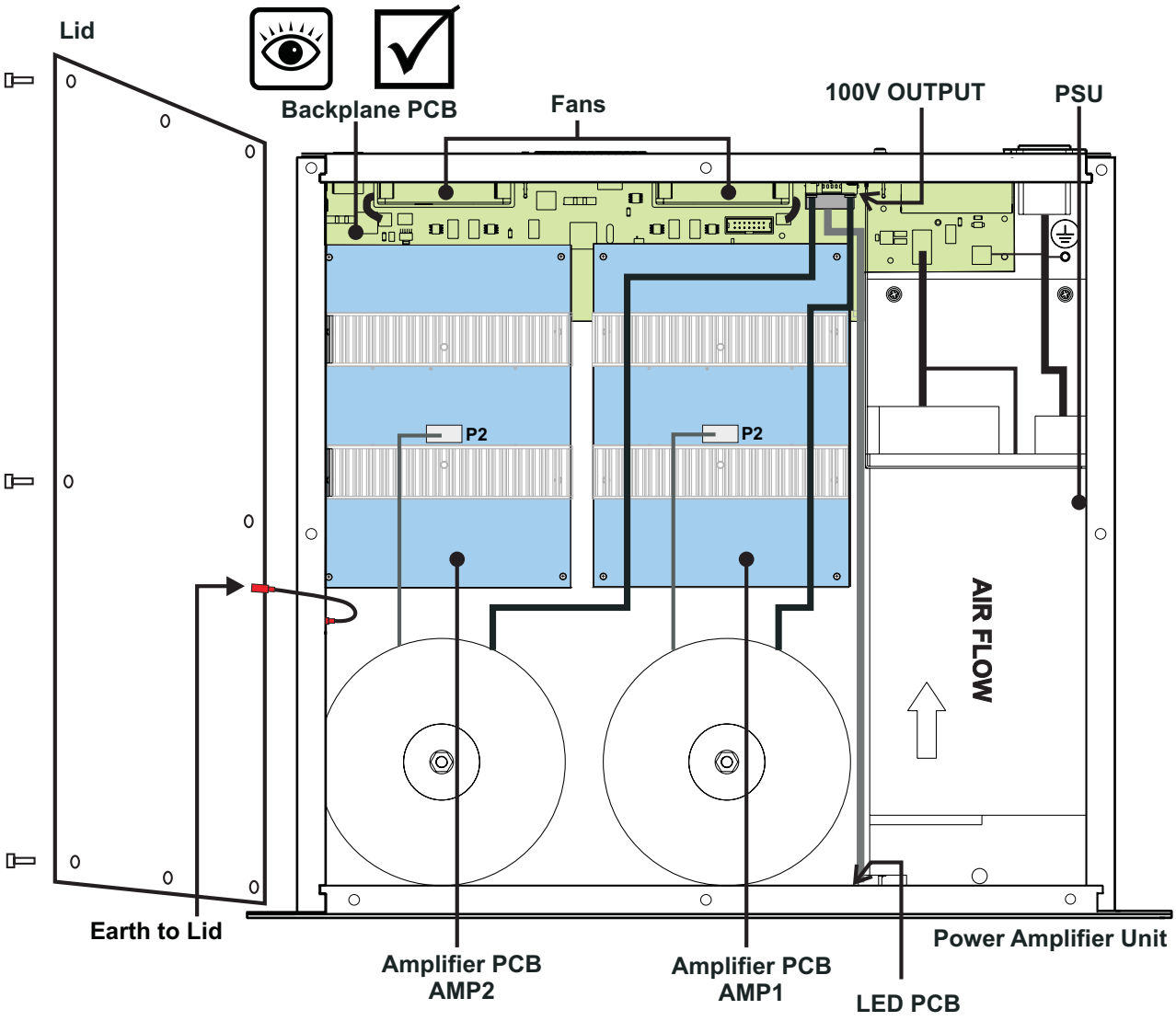
At this stage ensure the mains and battery power to the *Amplifier Unit* are switched OFF.

☐ Remove the 8 - fixing screws that secure the lid.
Lift the lid to the left and disconnect the earth lead from the spade connector on the lid.
Store the lid and fixing screws for refitting later.

☐ Ensure the external cables are routed correctly and connected to the rear panel of the Amplifier Unit.

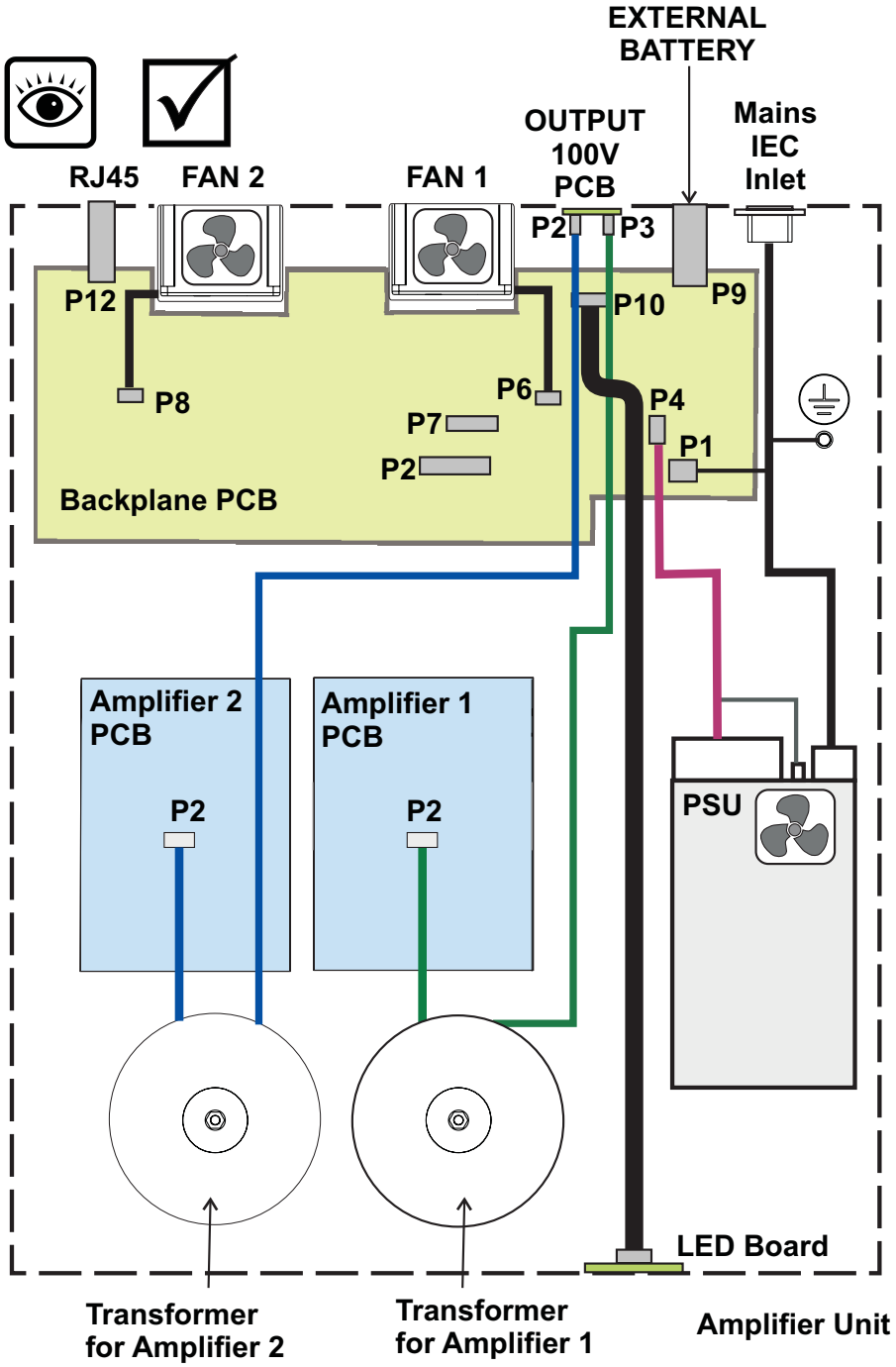
☐ Check the parts such as PCB assemblies, PSU, Fans and transformers within the enclosure are securely fitted.

☐ Ensure the ventilation holes at the front and rear of the unit have no obstruction to prevent air flow.



Internal wiring checks

☐ Check the condition of internal cables.
☐ Ensure the internal cables are securely fitted to their respective sockets.

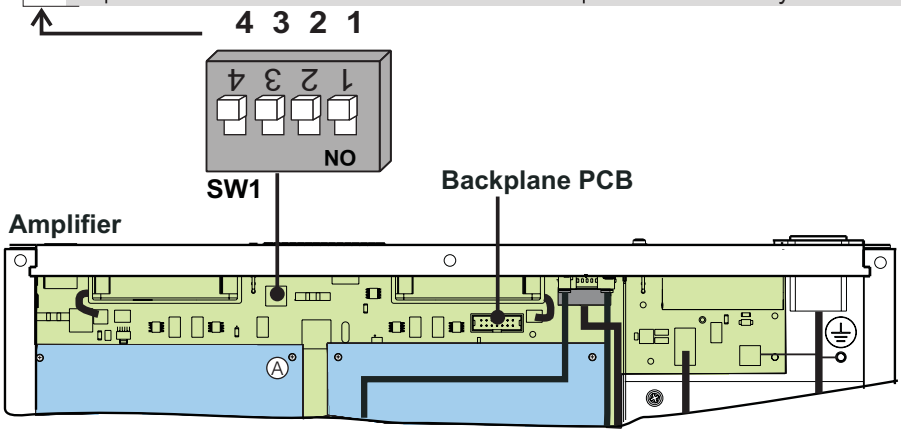


These output transformer wires MUST BE connected to the 'OUTPUT 100V' PCB in the manner illustrated.

Switch SW1

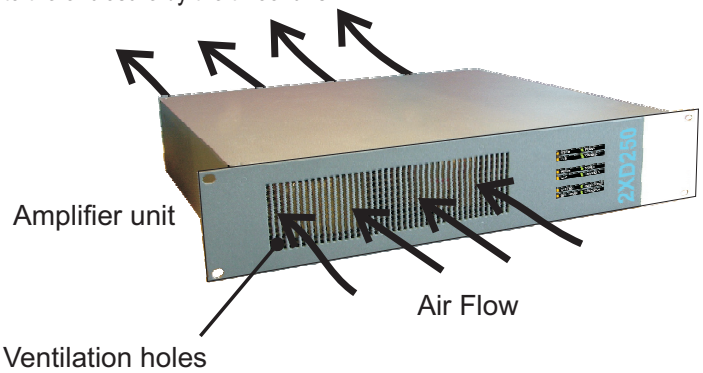
☐ Check each switch on the DIL Switch pack SW1 is set for required Amplifier operation.

	OFF (factory setting)	ON	
1	Channels 1 and 2 LEDs to indicate when audio signal is above -20dB	Channels 1 & 2 LEDs to indicate when audio signal is above -6dB	
2	System Fault to self clear after 2 minutes	System Fault reported as a latched indication	
3	Fully monitored standby battery supply	Standby battery supply monitoring is disabled for mains only powered system	
4	1 amplifier connected on the CAN bus	When 2 amplifers are connected on the CAN bus, then on ONE amplifier only this switch must be set to the ON position, for addressability.	V1.2 feature



Cooling Fans

There are ventilation holes to allow cool air to flow through the front panel and out of the holes on the rear panel of the amplifier enclosure. The air is pulled into the enclosure by the three fans.



There are two fans used to cool the Amplifier compartment, they operate automatically and their speed will vary to maintain a safe temperature inside the amplifier portion of the enclosure, while the PSU fan remains operational at all times for cool running.

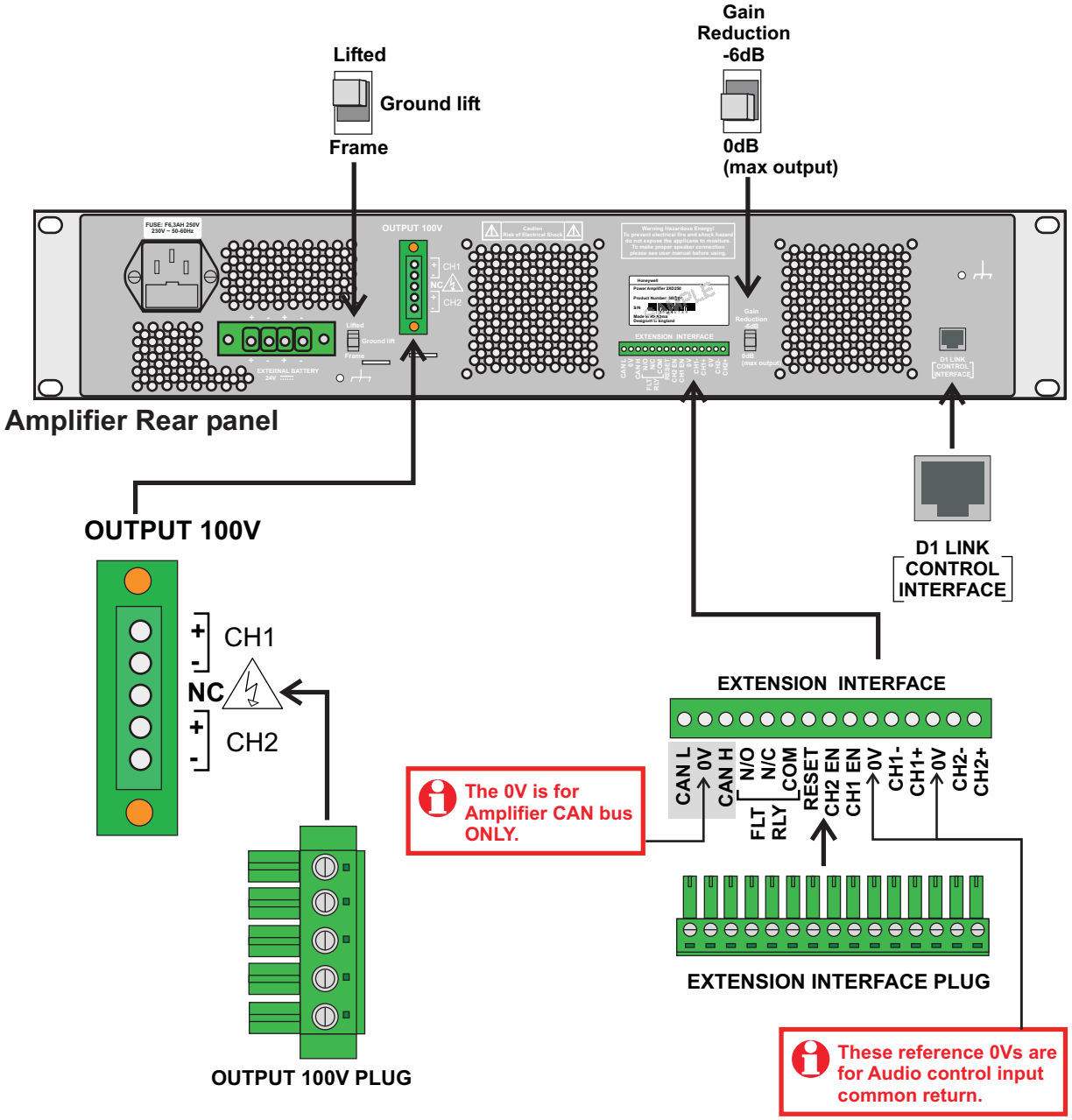
External wiring and switches on the rear panel

☐ Ensure the **external cables** are connected to the respective sockets on the rear panel, where appropriate using the plugs supplied. For connector / pin descriptions see the Data sheet - Power Amplifier.

☐ Set the 'Gain Reduction' switch where appropriate and if required to **'-6dB'** position during commissioning for test purposes. Ensure the switch is set to **'0dB'** (factory default setting) for Normal Operation after commissioning.

☐ The 'Ground Lift' switch is normally left the factory set **'Lifted'** position for most applications to ensure the amplifier performs in the best way to minimise the chance of earth loops causing common-mode noise pickup.

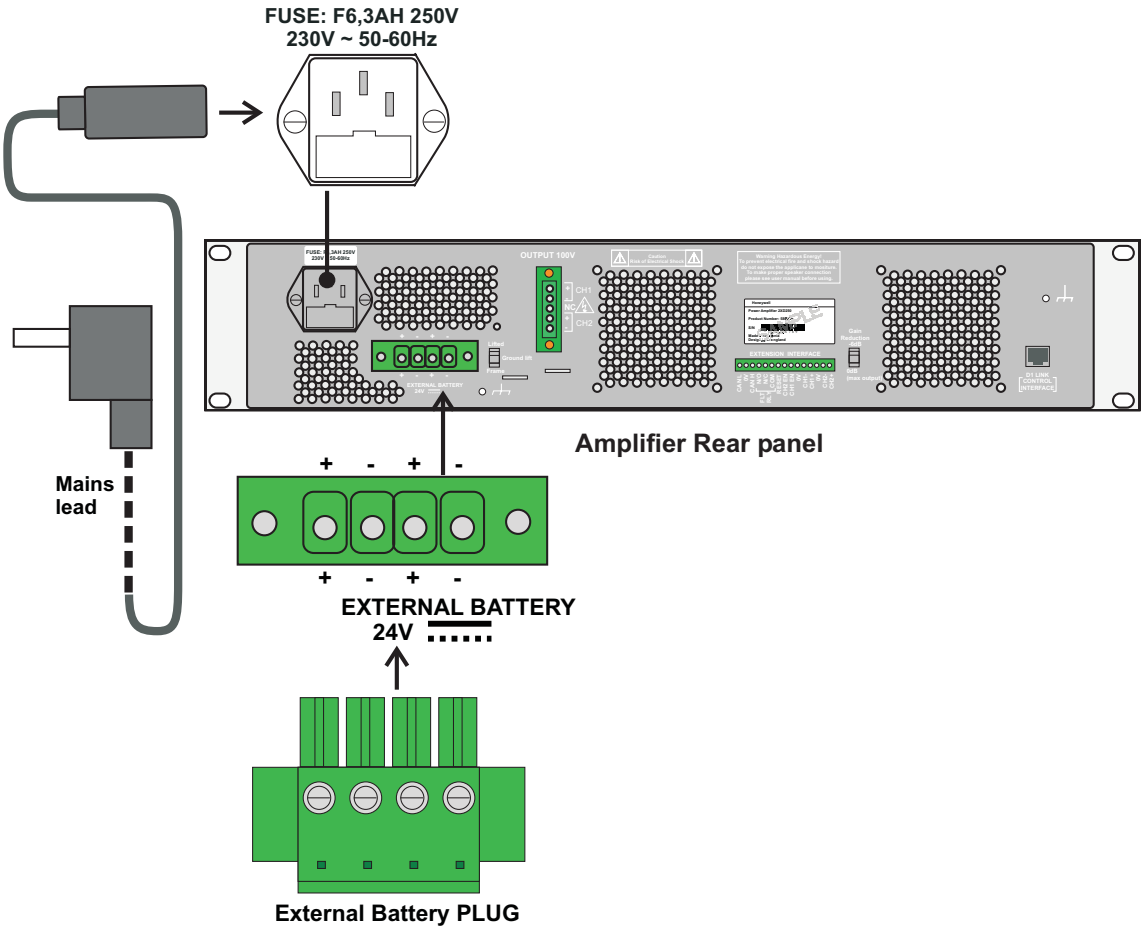
If the Amplifier Unit is to be used in a stand-alone mode, connected to audio sources that have class-II (double insulated) mains power, then the switch may be set to the **'Frame'** position to ensure that the signal input lines are referenced to mains earth at the Amplifier Unit. Note the amplifier enclosure remains safely bonded to mains earth at all times, irrespective of the switch position.

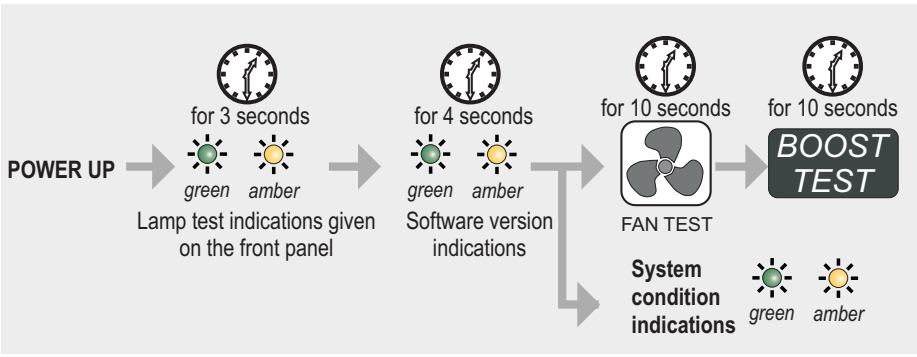


Power-up

Battery polarity must be observed when connecting batteries to the Power Amplifier. Incorrect connection of batteries to Power Amplifier will result in damage to the system equipment.

Always switch ON the Mains supply and allow at least 30 seconds before switching ON the External Battery supply to the amplifier unit. During power up the software version of the Amplifier Unit is indicated, see section on Software Version.



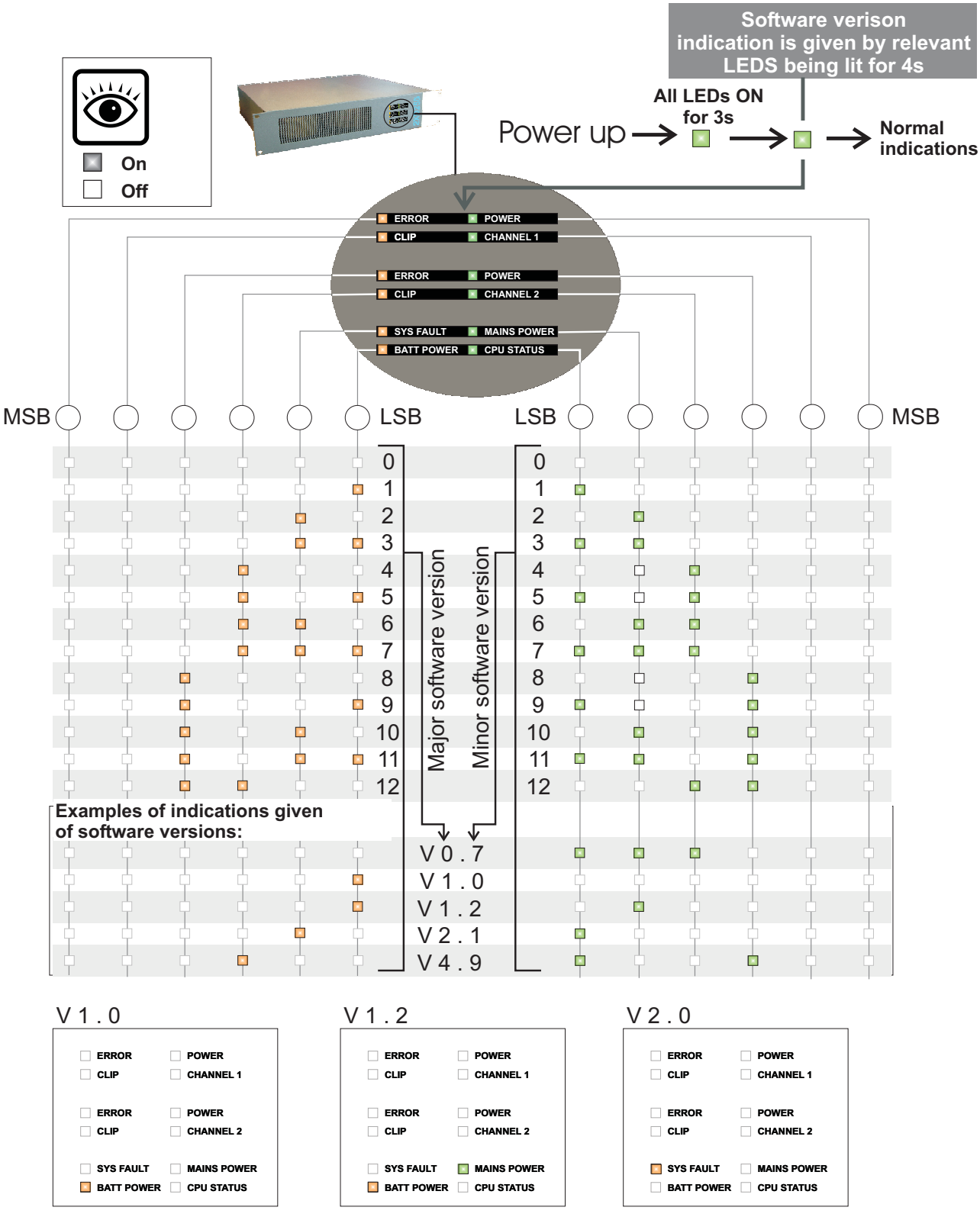


Hazardous voltage remains after operation of a protection fuse. Also, take appropriate action to guard against the risk of equipment having exposed live mains supply.

Software version

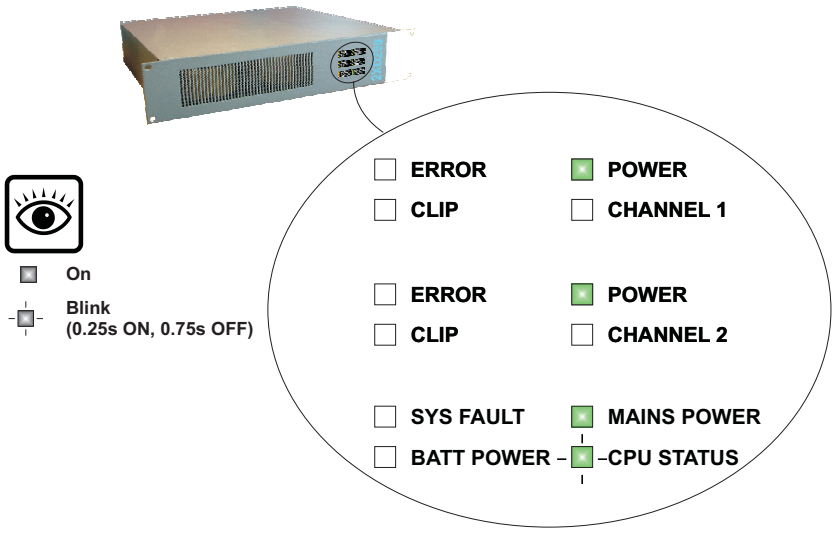
The Amplifier Unit software version is indicated for 4 seconds shortly after amplifier power up. If you need to know the software version then make a note of the LED indications given and determine the software version number using the chart below.

The 'major' and 'minor' software version numbers are indicated by the Yellow and Green LEDs respectively, in a binary format. The number range is from 0 to 63 (6 bits). The LEDs associated with the most significant bit (MSB) and the least significant bit (LSB) are shown below.



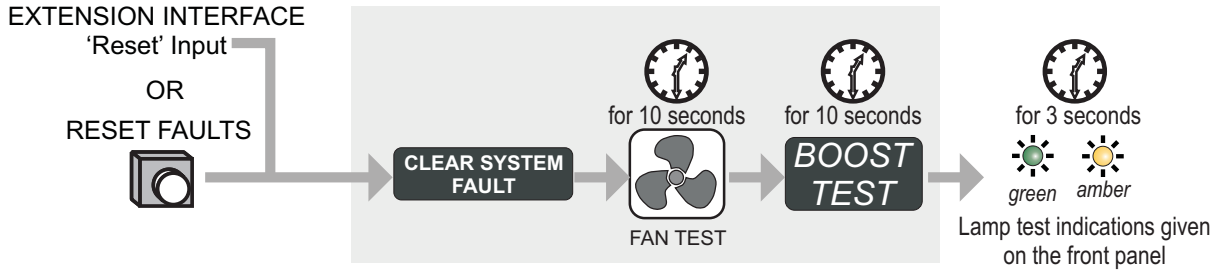
Normal indications

The indications shown below are those given once the *Amplifier Unit* has fully powered up and the unit is in a quiescent condition and is fault free:



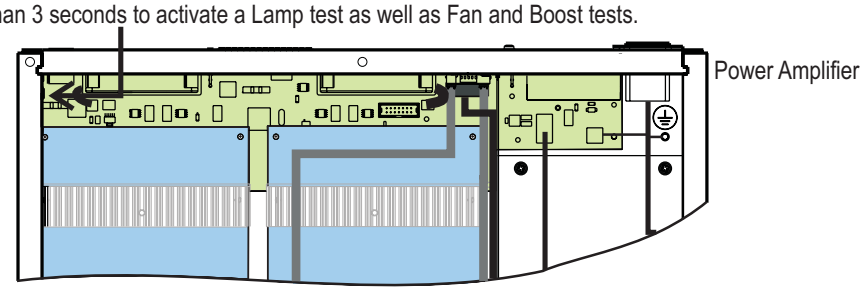
'Reset Faults' tests

It is possible to perform tests ON the Fans, Amplifier Boost stage and the LEDs on the front panel by activating the RESET FAULTS button on the 'Backplane PCB'. The same test is applied on the Fan and Amplifier Boost stage by an active signal on the RESET pin of the Extension interface, see page 8.



Single press on the RESET FAULTS button

Press and hold the RESET FAULTS button down for more than 3 seconds to activate a Lamp test as well as Fan and Boost tests.

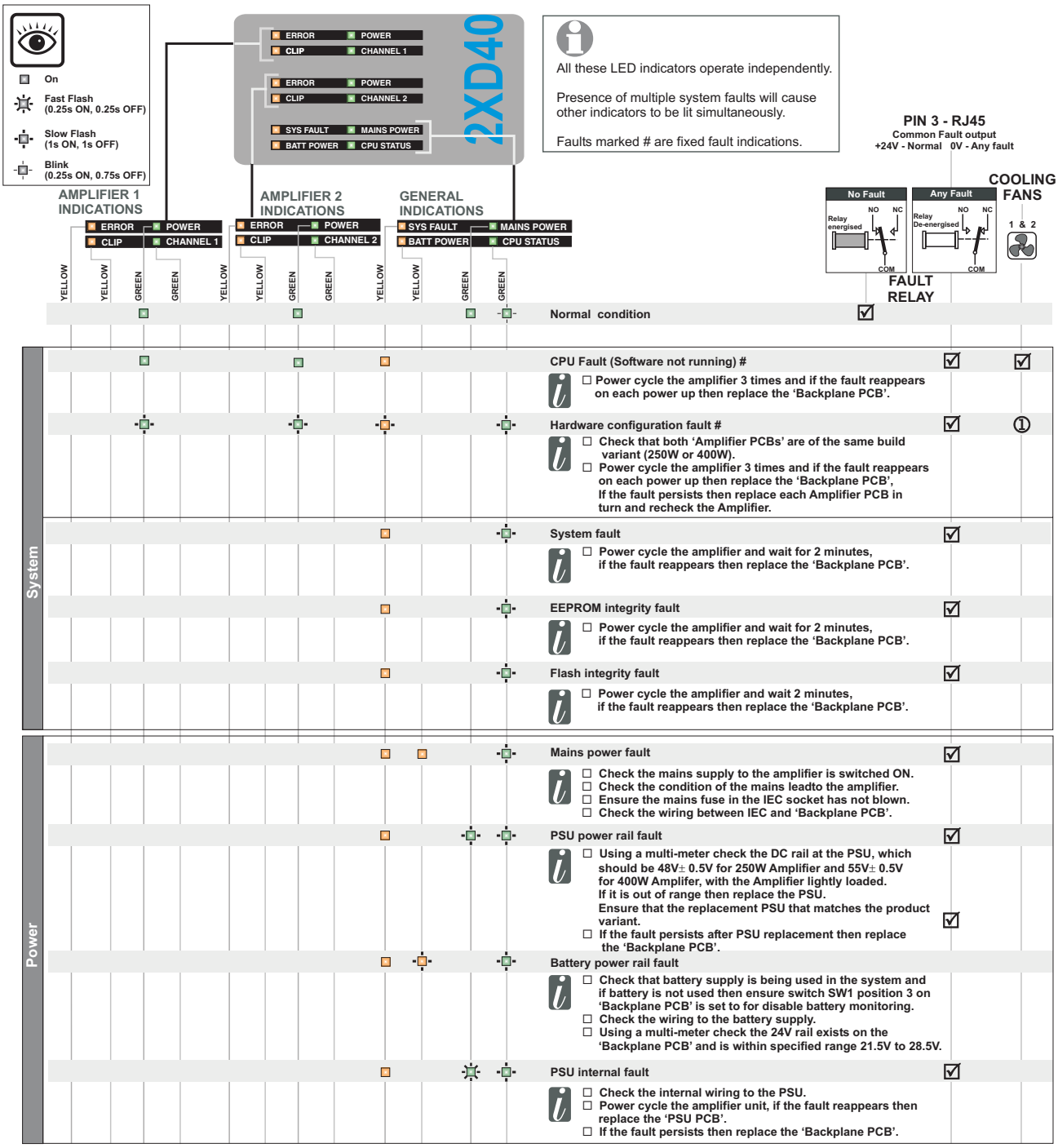


Fault finding and possible actions

Use the chart below to determine what the amplifier LED indications mean and possible action necessary to remove faults.

The information next to this symbol provide actions that can be taken by a trained engineer to rectify the fault.

System and Power fault indications

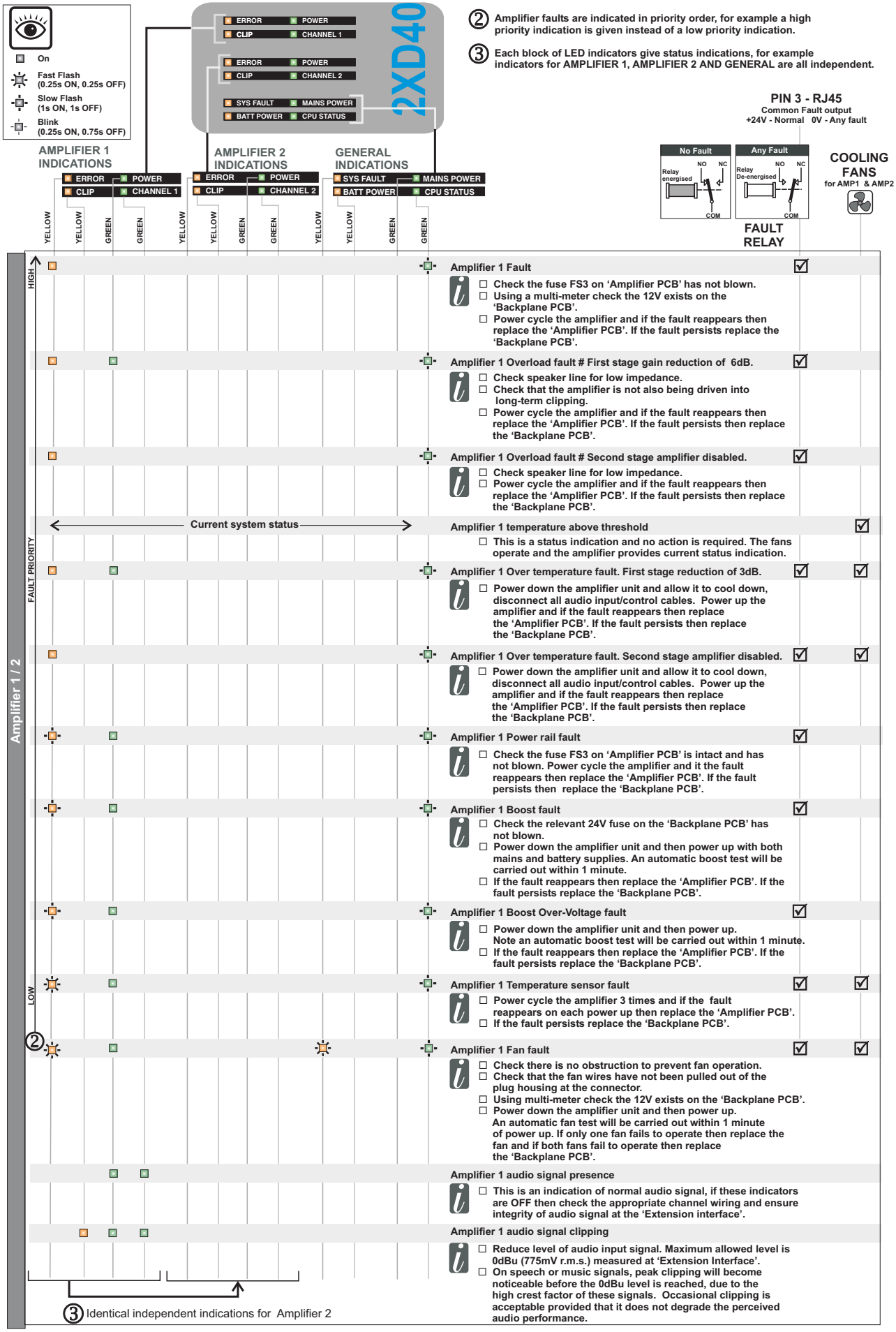


① When 'hardware configuration fault' is detected, both amplifiers are shut down and all monitoring is disabled.

② Amplifier faults are indicated in priority order, for example a high priority indication is given instead of a low priority indication.

③ Each block of LED indicators give status indications, for example indicators for AMPLIFIER 1, AMPLIFIER 2 AND GENERAL are all independent.

Once overload protection is triggered, it is re-evaluated every 2 seconds where the amplifier will automatically resume normal operation if the overloading condition no longer exists.


On
Fast Flash (0.25s ON, 0.25s OFF)
Slow Flash (1s ON, 1s OFF)
Blink (0.25s ON, 0.75s OFF)
2XD40
ERROR
POWER
CLIP
CHANNEL 1
CHANNEL 2
SYS FAULT
MAINS POWER
BATT POWER
CPU STATUS
AMPLIFIER 1 INDICATIONS
AMPLIFIER 2 INDICATIONS
GENERAL INDICATIONS
YELLOW
GREEN
② Amplifier faults are indicated in priority order, for example a high priority indication is given instead of a low priority indication.
③ Each block of LED indicators give status indications, for example indicators for AMPLIFIER 1, AMPLIFIER 2 AND GENERAL are all independent.
PIN 3 - RJ45
Common Fault output
+24V - Normal 0V - Any fault
No Fault
Any Fault
Relay energised
Relay De-energised
NO
NC
COM
FAULT RELAY
COOLING FANS
for AMP1 & AMP2
Amplifier 1 / 2
HIGH
FAULT PRIORITY
LOW
Current system status
Amplifier 1 Fault
☐ Check the fuse FS3 on 'Amplifier PCB' has not blown.
☐ Using a multi-meter check the 12V exists on the 'Backplane PCB'.
☐ Power cycle the amplifier and if the fault reappears then replace the 'Amplifier PCB'. If the fault persists replace the 'Backplane PCB'.
Amplifier 1 Overload fault # First stage gain reduction of 6dB.
☐ Check speaker line for low impedance.
☐ Check that the amplifier is not also being driven into long-term clipping.
☐ Power cycle the amplifier and if the fault reappears then replace the 'Amplifier PCB'. If the fault persists then replace the 'Backplane PCB'.
Amplifier 1 Overload fault # Second stage amplifier disabled.
☐ Check speaker line for low impedance.
☐ Power cycle the amplifier and if the fault reappears then replace the 'Amplifier PCB'. If the fault persists then replace the 'Backplane PCB'.
Amplifier 1 temperature above threshold
☐ This is a status indication and no action is required. The fans operate and the amplifier provides current status indication.
Amplifier 1 Over temperature fault. First stage reduction of 3dB.
☐ Power down the amplifier unit and allow it to cool down, disconnect all audio input/control cables. Power up the amplifier and if the fault reappears then replace the 'Amplifier PCB'. If the fault persists then replace the 'Backplane PCB'.
Amplifier 1 Over temperature fault. Second stage amplifier disabled.
☐ Power down the amplifier unit and allow it to cool down, disconnect all audio input/control cables. Power up the amplifier and if the fault reappears then replace the 'Amplifier PCB'. If the fault persists then replace the 'Backplane PCB'.
Amplifier 1 Power rail fault
☐ Check the fuse FS3 on 'Amplifier PCB' is intact and has not blown. Power cycle the amplifier and it the fault reappears then replace the 'Amplifier PCB'. If the fault persists then replace the 'Backplane PCB'.
Amplifier 1 Boost fault
☐ Check the relevant 24V fuse on the 'Backplane PCB' has not blown.
☐ Power down the amplifier unit and then power up with both mains and battery supplies. An automatic boost test will be carried out within 1 minute.
☐ If the fault reappears then replace the 'Amplifier PCB'. If the fault persists replace the 'Backplane PCB'.
Amplifier 1 Boost Over-Voltage fault
☐ Power down the amplifier unit and then power up. Note an automatic boost test will be carried out within 1 minute.
☐ If the fault reappears then replace the 'Amplifier PCB'. If the fault persists replace the 'Backplane PCB'.
Amplifier 1 Temperature sensor fault
☐ Power cycle the amplifier 3 times and if the fault reappears on each power up then replace the 'Amplifier PCB'.
☐ If the fault persists replace the 'Backplane PCB'.
② Amplifier 1 Fan fault
☐ Check there is no obstruction to prevent fan operation.
☐ Check that the fan wires have not been pulled out of the plug housing at the connector.
☐ Using multi-meter check the 12V exists on the 'Backplane PCB'.
☐ Power down the amplifier unit and then power up. An automatic fan test will be carried out within 1 minute of power up. If only one fan fails to operate then replace the fan and if both fans fail to operate then replace the 'Backplane PCB'.
Amplifier 1 audio signal presence
☐ This is an indication of normal audio signal, if these indicators are OFF then check the appropriate channel wiring and ensure integrity of audio signal at the 'Extension interface'.
Amplifier 1 audio signal clipping
☐ Reduce level of audio input signal. Maximum allowed level is 0dBu (775mV r.m.s.) measured at 'Extension Interface'.
☐ On speech or music signals, peak clipping will become noticeable before the 0dBu level is reached, due to the high crest factor of these signals. Occasional clipping is acceptable provided that it does not degrade the perceived audio performance.
③ Identical independent indications for Amplifier 2

How to' Power Cycle'

During fault finding some indications require the Amplifier to be power cycled, to do this you will need to:

a) Disconnect the battery supply to the Amplifier Unit.

b) Switch OFF the Mains supply to the Amplifier Unit.

c) After a short duration switch ON the Mains Supply to the Amplifier Unit.

d) Wait for 30 seconds and reconnect the battery supply to the Amplifier Unit.

How to measure reference 12V and 24V

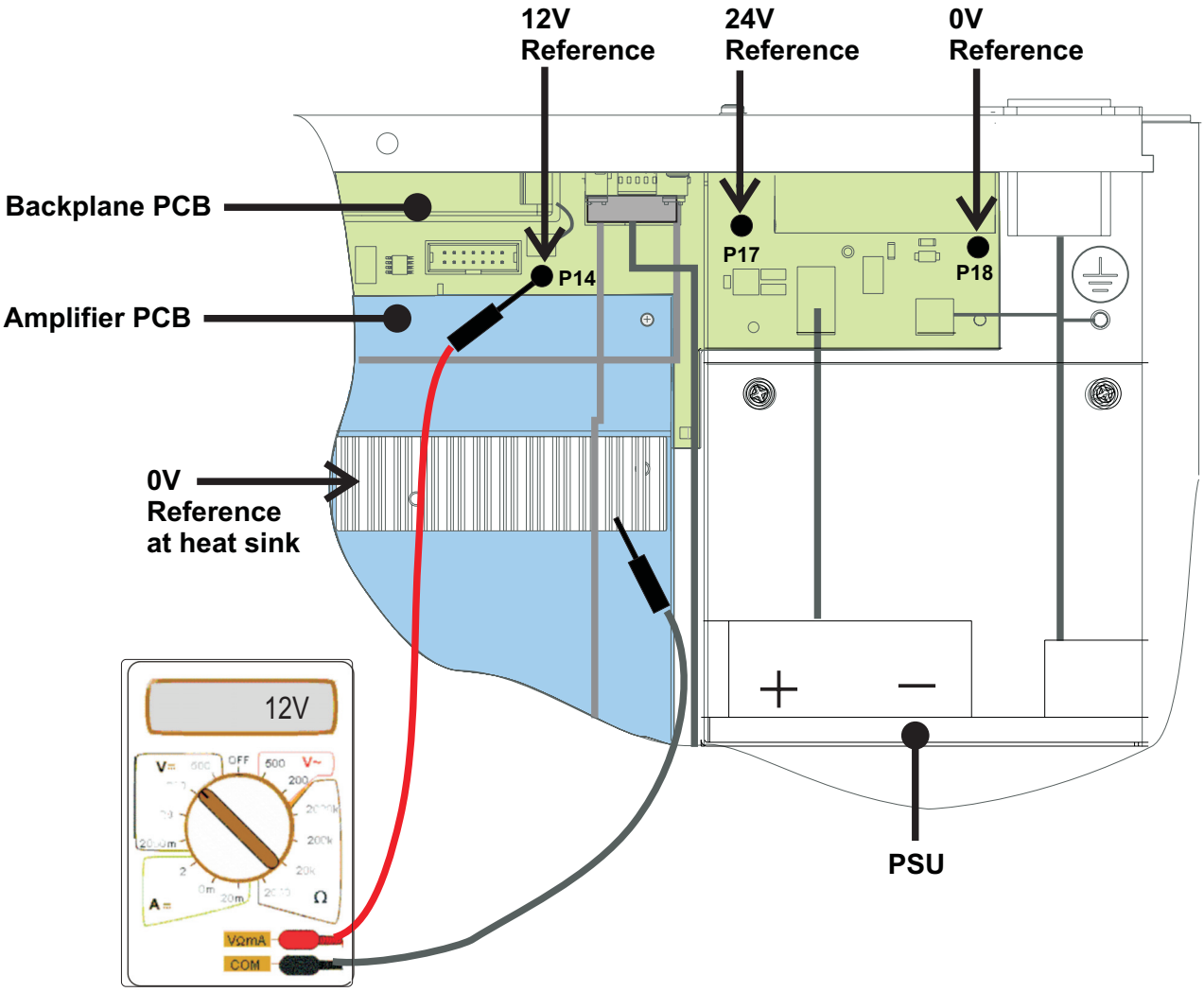
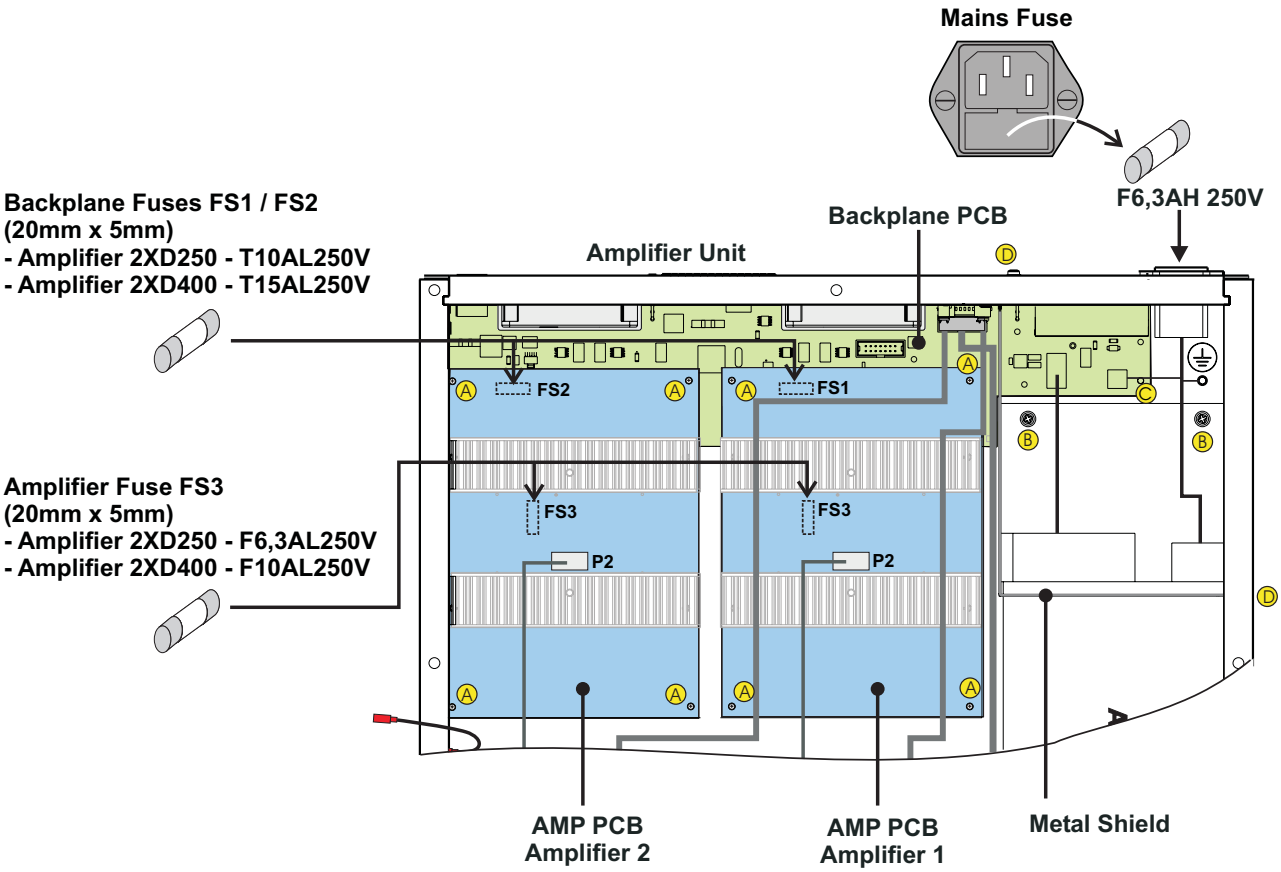


Illustration to assist with part replacement

The following illustration show the location of fuses and fixing points which are referred to in the procedures for replacing parts.



How to replace a fuse on the 'AMP PCB'

See 'Illustration to assist with part replacement' above and for 'Internal wiring' see page 6.

Always power down the mains and then the battery supply to the amplifier unit before removal of any part from within the assembly.

a) Remove the 8 - fixing screws that secure the lid. Lift the lid by opening it to the left and then disconnect the earth lead at the spade connector on the lid.

b) Disconnect the cable at connector P2 on the 'AMP PCB'.

c) Remove the respective 4 - fixing screws (A) that secure the 'AMP PCB' and carefully unplug and remove 'AMP PCB'.

d) Replace the fuse FS3 located on the component side of an 'AMP PCB'.

e) Refit the 'AMP PCB'.

f) Reconnect cable to P2 on 'AMP PCB'.

g) Refit the earth cable to lid and secure the lid with screws.

h) Finally follow the Amplifier Unit 'Power up procedures'.

How to replace fuses on the 'Backplane PCB'

See 'Illustration to assist with part replacement' on page 15 and for 'Internal wiring' see page 6.

Always power down the mains and then the battery supply to the amplifier unit before removal of any part from within the assembly.

a) Remove the 8 - fixing screws that secure the lid. Lift the lid by opening it to the left and then disconnect the earth lead at the spade connector on the lid.

b) Disconnect the cables at connectors P2 on 'AMP PCBs'.

c) Remove the 4 - fixing screws (A) that secure each 'AMP PCBs' and carefully unplug and remove 'AMP PCBs' from 'Backplane PCB'.

d) Check and replace the appropriate fuses FS1/FS2 located on the 'Backplane PCB'.

e) Refit the 'AMP PCBs'.

f) Reconnect cables to connectors P2 on 'AMP PCBs'.

g) Refit the earth cable to lid and secure the lid with screws.

h) Finally follow the Amplifier Unit power up procedures, see page 9.

How to replace an 'Amplifier PCB'

See 'Illustration to assist with part replacement' on page 15 and for 'Internal wiring' see page 6.

Always power down the mains and then the battery supply to the amplifier unit before removal of any part from within the assembly.

a) Remove the 8 - fixing screws that secure the lid. Lift the lid by opening it to the left and then disconnect the earth lead at the spade connector on the lid.

b) Disconnect the cable at connector P2 on the appropriate 'AMP PCB'.

c) Remove the 4 - fixing screws (A) that secure the 'AMP PCB' and carefully unplug and remove 'AMP PCB'.

d) Refit the 'AMP PCB'.

e) Reconnect the cable to P2 on 'AMP PCB'.

f) Refit the earth cable to lid and secure the lid with screws.

g) Finally follow the Amplifier Unit Power up procedures, see page 9.

How to replace the 'Backplane PCB'

See 'Illustration to assist with part replacement' on page 15 and for 'Internal wiring' see page 6.

Always power down the mains and then the battery supply to the amplifier unit before removal of any part from within the assembly.

a) Disconnect all external cables from the rear panel of the amplifier unit. Note the 'OUTPUT 100V', 'EXTENSION INTERFACE' and 'EXTERNAL BATTERY' wires are connected to plugs that can be unplugged from the rear panel.

b) Remove the 8 - fixing screws that secure the amplifier lid. Lift the lid by opening it to the left and then disconnect the earth lead at the spade connector on the lid.

c) Disconnect the cables at connector P2 on each 'AMP PCBs'.

d) Remove the 4 - fixing screws (A) that secure each 'AMP PCB' and carefully unplug and remove 'AMP PCBs'.

e) Remove the 'Metal Shield' located on the rear right from the amplifier unit, it is secured by 2 - screws (D) (one at the rear and another on the right side of the enclosure).

f) Unplug the LED board ribbon cable from the socket P10 on the 'Backplane PCB'.

g) Unplug each fan cable from the sockets P8 and P6 on the 'Backplane PCB'.

Do not pull by the wires when unplugging the fan cable, unplug the fan cable by pulling on the plug portion of the cable assembly.

h) Unplug the DC output cable from P4 on the 'Backplane PCB'.

i) Unplug the Mains monitoring cable from P1 on the 'Backplane PCB'.

j) Unscrew and remove 4 - nylon PCB support pillars at upper (A) locations, which are used to secure the 'Backplane PCB'. Also remove the earth continuity/fixing screw (C) located at the bottom left of the 'Backplane PCB'. Carefully remove the 'Backplane PCB' from the enclosure.

k) Fit the replacement 'Backplane PCB' into the enclosure, ensuring it rests in-between the card guide slots on the left side of the metal enclosure. Refit the 4-Nylon PCB support pillars and ensure the earth continuity/fixing screw is securely fitted at location marked (C) .

l) Reconnect cables to sockets P1, P4, P8, P6 and P10 on the 'Backplane PCB'.

m) Refit the 'Metal Shield' using the two screws.

n) Plug in the 'AMP PCBs' and secure them with screws and fit the respective cables to socket P2 on 'AMP PCBs'.

o) Reconnect all external cables to the rear of the amplifier unit.

p) Refit the earth cable to lid and secure the lid with the 8-fixing screws.

q) Finally follow the Amplifier Unit Power up procedures, see page 9.

How to replace the PSU module

See 'Illustration to assist with part replacement' on page 15 and for 'Internal wiring' see page 6.

Always power down the mains and the battery supply to the amplifier unit before removal of any part from within the assembly.

a) Disconnect the mains cable from the rear of the amplifier unit.

b) Remove the 8 - fixing screws that secure the lid. Lift the lid by opening it to the left and then disconnect the earth lead at the spade connector on the lid.

c) Remove the 'Metal Shield' located on the rear right from the amplifier assembly, it is secured by 2 - screws (D) (one at the rear and another on the side of the enclosure).

d) Remove the 3 fixing screws (B) that secure the PSU/chassis assembly.

e) Lift out and hold the PSU/chassis assembly while disconnecting the Mains and Power cables, you will need to remove the protective cover fitted over the terminals to access the screws. Also unplug the monitoring cable from the socket on PSU.

f) Remove the PSU from the Chassis and fit the replacement PSU onto the chassis.

g) Refit the cables to PSU and replace the protective cover.

h) Fit the PSU chassis assembly into the enclosure.

i) Refit the metal shield and secure it using the two fixing screws.

j) Reconnect the earth cable to the lid and secure the lid using the 8 fixing screws.

k) Reconnect the Mains cable to the IEC socket on the rear panel.

l) Finally follow the Amplifier Unit Power up procedures, see page 9.

How to replace a Fan

See 'Illustration to assist with part replacement' on page 15 and for 'Internal wiring' see page 6.

Always power down the mains and then the battery supply to the amplifier unit before removal of any part from within the assembly.

a) Follow procedures 'How to replace the 'Backplane PCB' from **a)** to **j)**

b) Unplug the respective Fan cable from socket P8 or P6 located on the 'Backplane PCB'.

c) Pull out the fan assembly from enclosure just enough to allow individual rubber tails to be taken out.

d) When refitting a fan ensure each of the four rubber tails are guided through the corresponding pair of fixing holes.

e) Reconnect the fan cable.

f) Follow procedures 'How to replace the 'Backplane PCB' from **k)** to **q)**.

System Test

Test the system to ensure the Voice Alarm, PA, and Background music are operating correctly and at the required volume.

Notes

These amplifier products comply with: EN 60065:2002/A1:2006 Audio, video and similar electronic apparatus - Safety requirements.

WEEE Directive:
At the end of their useful life, the packaging, product and batteries should be disposed of via a suitable recycling centre.
Do not dispose of with your normal household waste.
Do not burn.

At the end of their useful life, the packaging, product and batteries should be disposed of via a suitable recycling centre and in accordance with national or local legislation.

Honeywell	Novar GmbH a Honeywell Company Dieselstr. 2 D - 41469 Neuss, Germany	Honeywell Life Safety Austria GmbH Lemböckgasse 49 A - 1230 Wien, Austria	Honeywell Life Safety AS Lierstranda Industriområde Postboks 3514 3007 Drammen Norway
	Tel.: +49 (0) 2137 170 (Verwaltung) Tel.: +49 (0) 2137 17 600 (Kundenbetreuungscenter) Fax.: +49 (0) 2137 17 286 E - Mail: info@esser-systems.de	Tel.: +43 (0) 1 600 60 30 Fax: +43 (0) 1 600 60 30 - 900 E – Mail: hls-austria@honeywell.com	Tlf.: +47 32 24 48 00 Faks: +47 32 24 48 01 E-post: fire.safety@honeywell.com
	www.esser-systems.de	www.hls-austria.com	www.eltek-fs.com