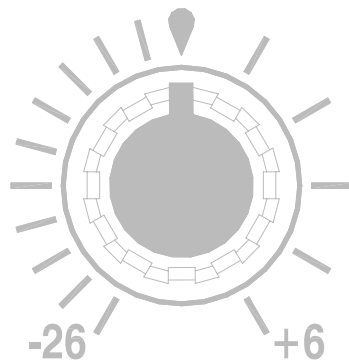


ALLEN & HEATH



 **XONE:32**
P R O F E S S I O N A L D J M I X E R

SERVICE MANUAL

Publication AP4265

Allen & Heath Technical Support

This service manual provides technical information for servicing the **XONE:32**. Whilst we believe the information presented to be reliable we do not assume responsibility for inaccuracies. We also reserve the right to make changes in the interest of further product development.

For further technical support please contact us at Allen & Heath. The contact details are printed below. To help us provide the most efficient service please quote the console serial number in any communication regarding this product. Our Internet site provides further information on our full product range as well as contact details for our distribution network.



This product complies with the European Electromagnetic Compatibility directives 89/336/EEC & 92/31/EEC and the European Low Voltage Directives 73/23/EEC & 93/68/EEC.

This product has been tested to EN55103 Parts 1 & 2 1996 for use in Environments E1, E2, E3, and E4 to demonstrate compliance with the protection requirements in the European EMC directive 89/336/EEC. During some tests the specified performance figures of the product were affected. This is considered permissible and the product has been passed as acceptable for its intended use. Allen & Heath has a strict policy of ensuring all products are tested to the latest safety and EMC standards. Customers requiring more information about EMC and safety issues can contact Allen & Heath.

NOTE: Any changes or modifications to the console not approved by Allen & Heath could void the compliance of the console and therefore the user's authority to operate it.

XONE:32 Service Manual AP4265 Issue 2

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Important Safety Instructions – Read First

- Read instructions:** Retain these safety and operating instructions for future reference. Adhere to all warnings printed here and on the console.
- Power sources:** Connect the console to a mains power only of the type described in this Service Manual and marked on the rear panel. The power source must provide a good ground connection.
- Power cord:** Use the power cord with sealed mains plug appropriate for your local mains supply as provided with the console. If the provided plug does not fit into your outlet consult the Allen & Heath technical support department for assistance. Route the power cord so that it is not likely to be walked on, stretched or pinched by items placed upon or against it.
- Grounding:** Do not defeat the grounding and polarisation means of the power cord plug. Do not remove or tamper with the ground connection in the power cord.
- Ventilation:** Do not obstruct the ventilation slots or position the console where the air flow required for ventilation is impeded. If the console is to be operated in a rack unit or flightcase ensure that it is constructed to allow adequate ventilation.
- Moisture:** To reduce the risk of fire or electric shock do not expose the console to rain or moisture or use it in damp or wet conditions. Do not place containers of liquids on it which might spill into any openings.
- Heat:** Do not locate the console in a place subject to excessive heat or direct sunlight as this could be a fire hazard. Locate the console away from any equipment which produces heat such as power supplies, power amplifiers and heaters.
- Environment:** Protect from excessive dirt, dust, heat and vibration when operating and storing. Avoid tobacco ash, drinks spillage, and smoke, especially that associated with smoke machines.
- Handling:** To prevent damage to the controls and cosmetics avoid placing heavy objects on the control surface, scratching the surface with sharp objects, or rough handling and vibration. Protect the controls from damage during transit. Use adequate packing if you need to ship the unit.
- Servicing:** Switch off the equipment and unplug the power cord immediately if it is exposed to moisture, spilled liquid, objects fallen into the openings, the power cord or plug become damaged, during lightening storms, or if smoke, odour or noise is noticed.
- Installation:** Install the console in accordance with the instructions printed in the User Guide. Do not connect the output of power amplifiers directly to the console. Use audio connectors and plugs only for their intended purpose.



Important Mains Plug Wiring Instructions

The console is supplied with a moulded mains plug fitted to the AC mains power lead. Follow the instructions below if the mains plug has to be replaced.

The wire which is coloured Green/Yellow or Green must be connected to the terminal in the plug which is marked with the letter E or with the Earth symbol.

This appliance must be earthed.

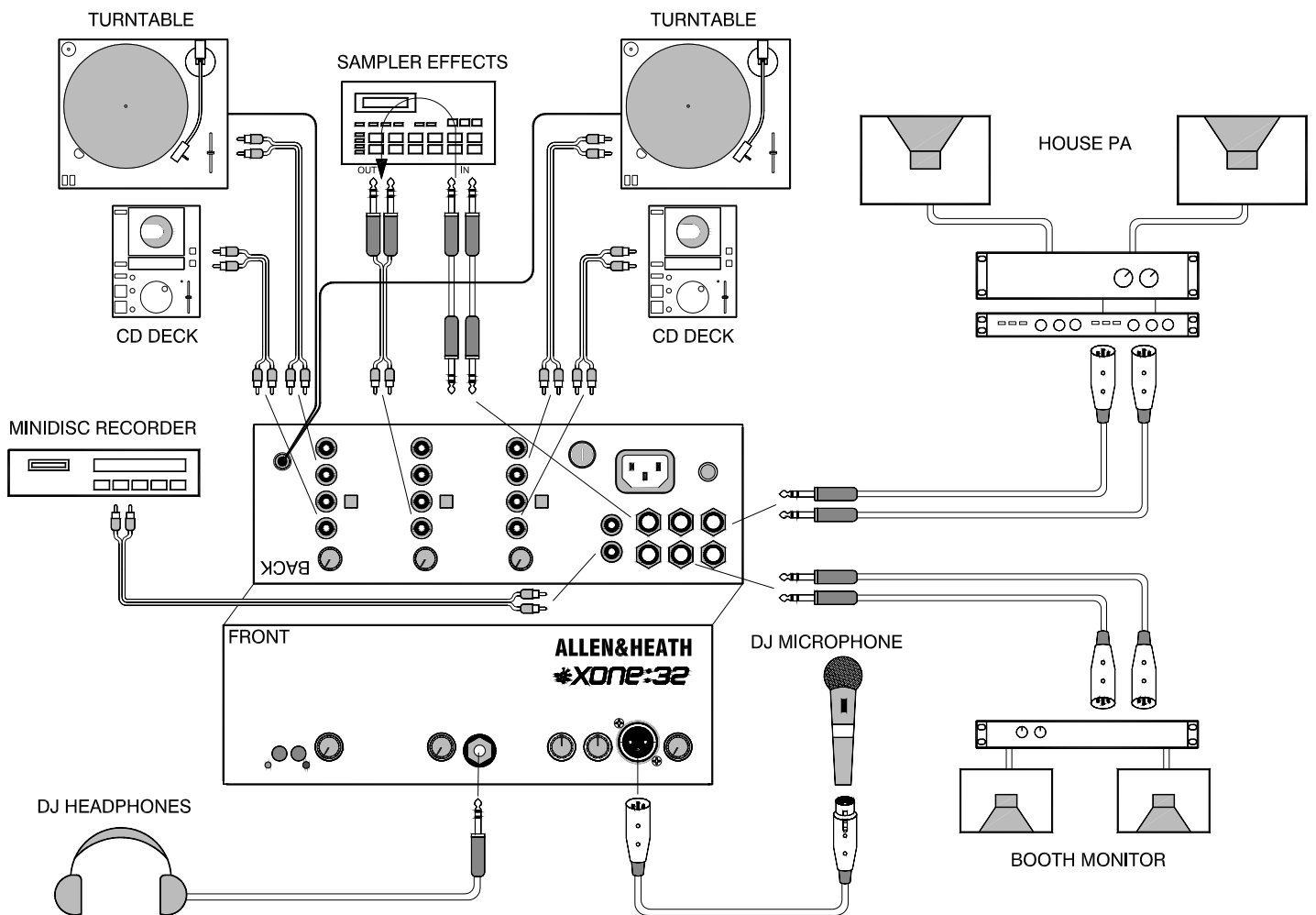
The wire which is coloured Blue or White must be connected to the terminal in the plug which is marked with the letter N.

The wire which is coloured Brown or Black must be connected to the terminal in the plug which is marked with the letter L.

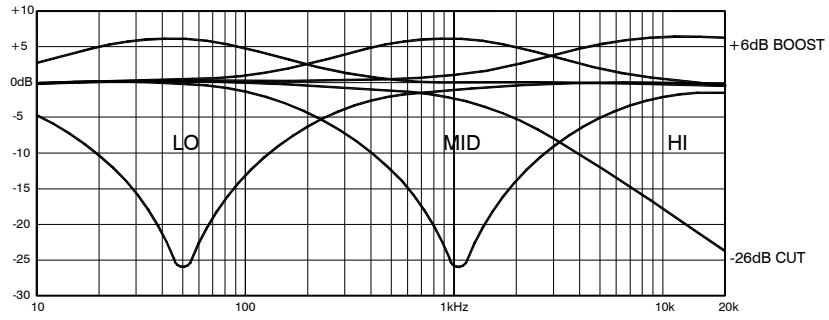
Ensure that these colour codes are followed carefully in the event of the plug being changed.

Key Features

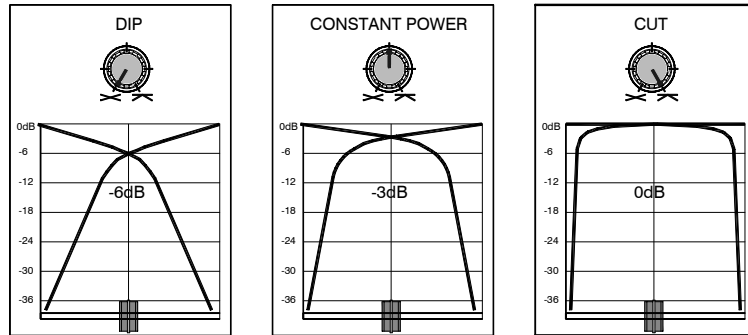
- 3 Stereo channels with switchable line and RIAA phono inputs
- DJ microphone input
- Separate main mix, record, booth and headphones monitor outputs
- Stereo Aux output for effects
- 3 Band +6/-26 asymmetric EQ with extended cut
- Removable VCA CROSSFADER with reverse and variable contour
- Crossfade position dependent TRANSMUTE buttons for transform and punch effects
- Analogue state variable VCF filter effects with filter type, frequency and resonance controls
- LFO filter frequency control with finger tap tempo select
- DRS™ Digital Recall System with 4 user programmable presets for filter effects
- Advanced cue system with interlock and cue/mix fader for performance preview
- Extensive channel and output metering
- Sensible layout of setup and performance controls across three surfaces
- High grade dual rail gold contact crossfader
- Universal internal power supply for any worldwide mains voltage



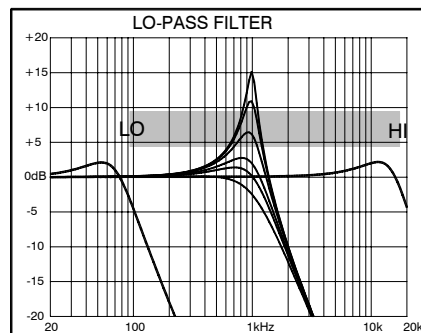
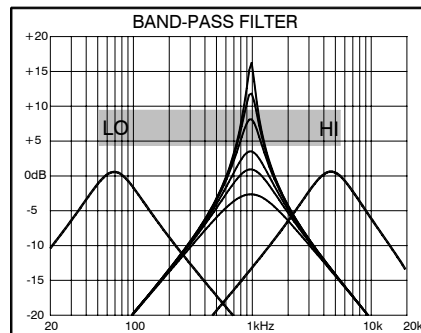
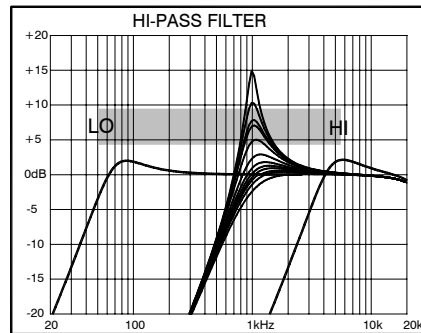
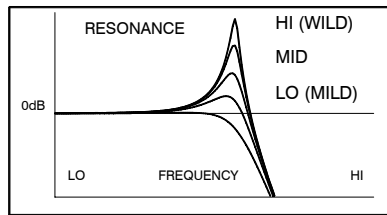
EQ Curves



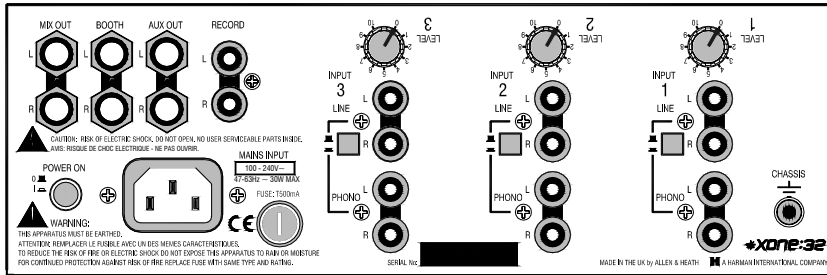
Crossfader Curves



VCF Curves

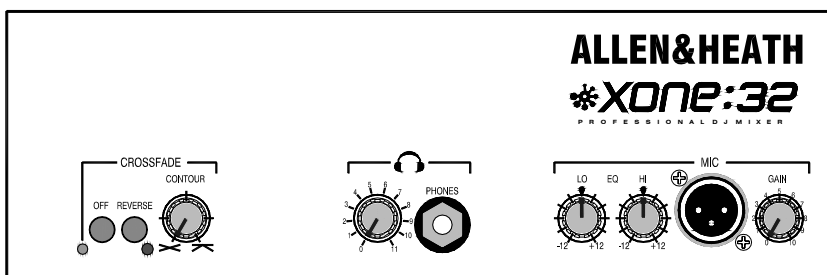
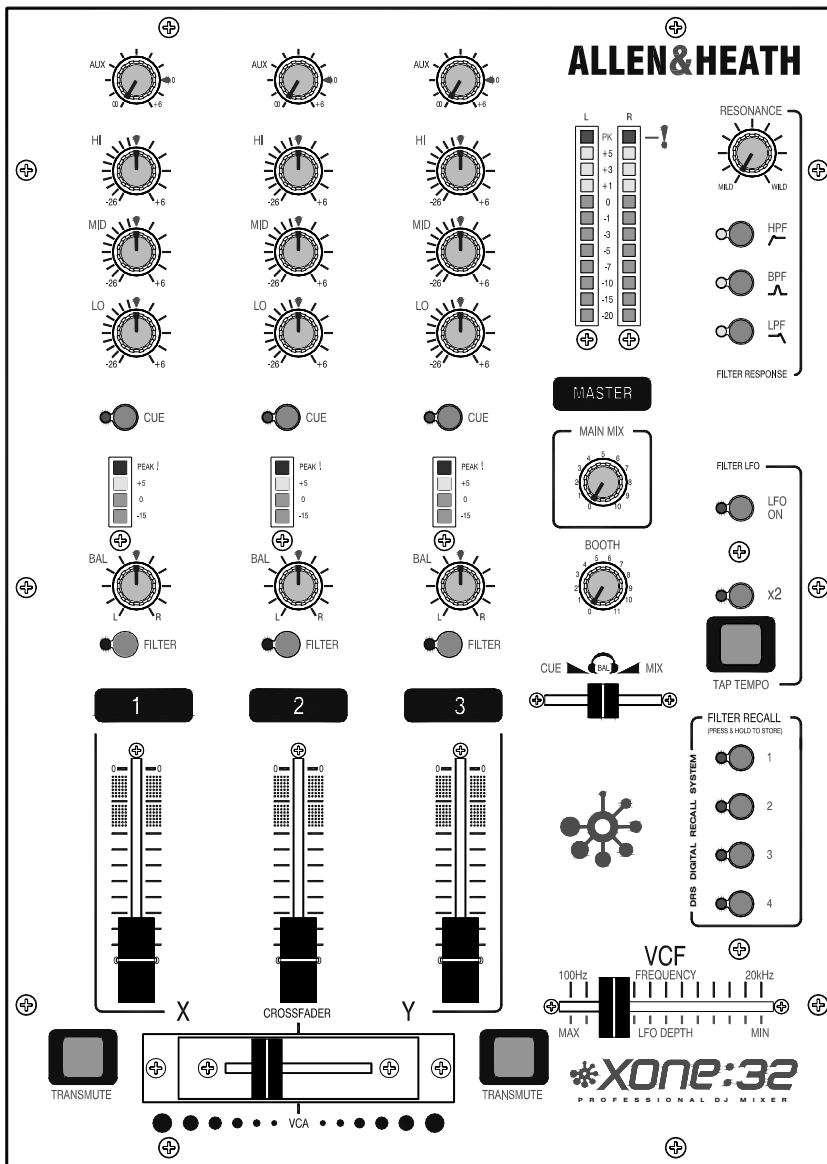


Front and Rear Panel Layouts



Welcome to the XONE:32 professional DJ mixer. This stylish and solidly built 3 channel club format console presents a unique combination of performance tools for the professional DJ. Above all, it features a sound quality second to none. XONE:32 has been designed and constructed using the same rigorous standards we apply to our large format professional consoles used and respected by top engineers and performers throughout the world.

Please refer to the User Guide for the operating instructions and application notes.



Specifications

0dBu = 0.775 Volts rms, +4dBu = 1.23V rms 0dBV = 1 Volt rms, -10dBV = 316mV rms

Max output level	TRS +21dBu into >2k ohm RCA +15dBu into >10k ohm	Music EQ	3-Band +6/-26dB 100Hz, 1kHz, 10kHz
Headroom	Channels +21dB Mix to output +23dB	Mic EQ	2-Band +/-10dB 300Hz, 5kHz HPF 60Hz
Freq response	+0/-1dB 10Hz to 30kHz	Ch fader	60mm stereo
Distortion	< 0.02% THD+N @1kHz +10dBu	Crossfader	45mm stereo VCA Dual rail, gold contacts Replaceable, P&G option
Crosstalk	< 90dB Channel shutoff @1kHz	Filters	Stereo analogue VCF HPF, BPF, LPF types 100Hz to 20kHz sweep
MIC EIN 22-22kHz	-126dB 150 ohm source	LFO	Finger tap tempo entry Depth modulation of VCF x2 Multiplier
Residual noise	TRS -102dBu RCA -92dBu		
Mix noise	TRS -87dB		
Ch meters	Peak reading 4 led -15, 0, +5, +8 (PK)		
Main meters	Peak reading 12 led -20 to +8 (PK)		

Power Supply

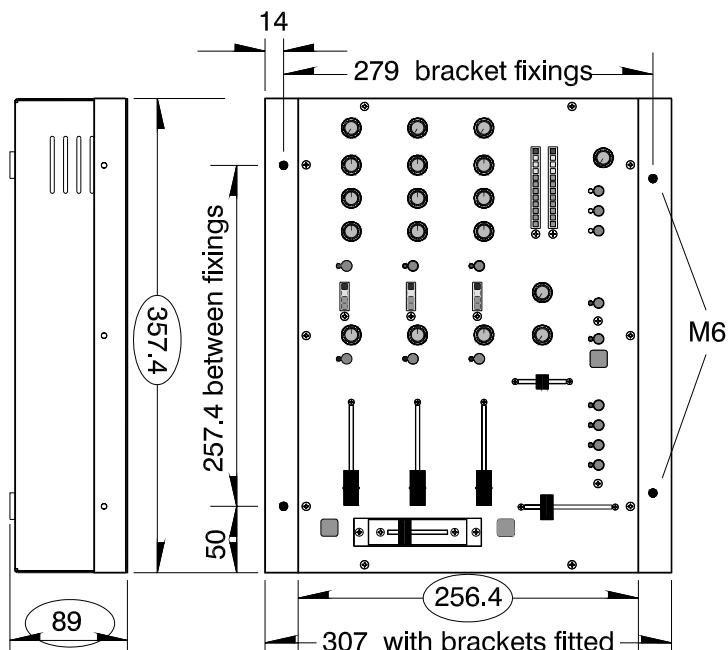
Internal switch mode power unit with auto sensing mains input.

MAINS IN socket	IEC 3 pin
Power lead	Country dependent with moulded mains plug supplied
AC mains	100 to 240V AC @ 50/60Hz
Consumption	30W max
Mains fuse rating	100-240V AC T500mA 20mm

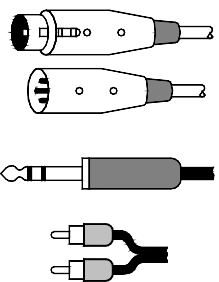
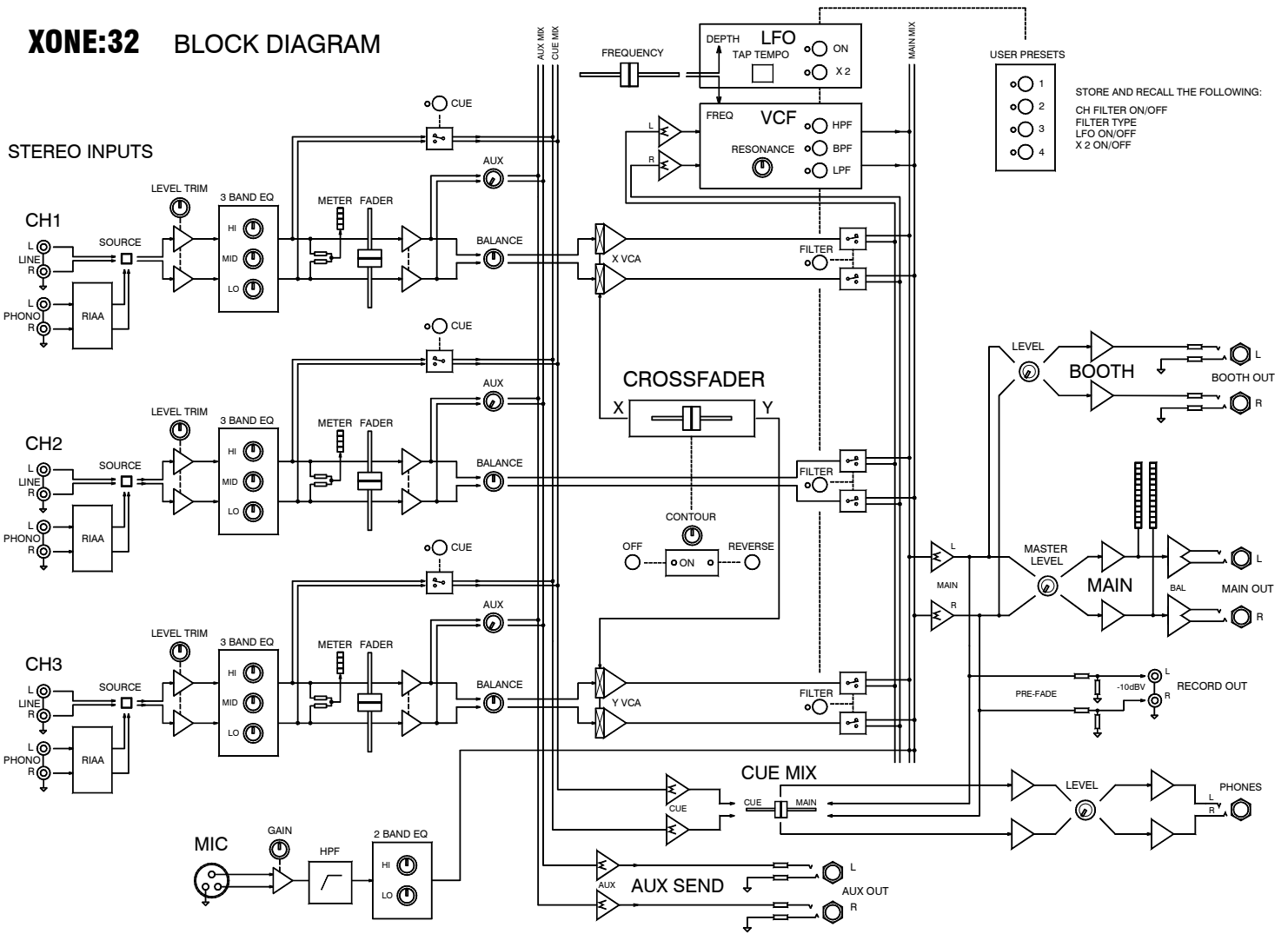
Dimensions and Weights

The console is fitted with rubber feet for desktop operation. An optional screw on rack ear kit is available for rack or plinth mounting. This is fixed in place using M6 screws or bolts. Contact your Allen & Heath agent for further information. The order code for the kit is: **XONE:32-RK**

	Width	Height	Depth	Weight
Desktop	257 mm (10.1")	89 mm (3.5")	358 mm (14.1")	4 kg (9 lbs)
Rack ears fitted	307 mm (12.1")	89 mm (3.5")	358 mm (14.1")	
Packed	475 mm (18.7")	210 mm (8.3")	395 mm (15.6")	5 kg (11 lbs)



XONE:32 BLOCK DIAGRAM



Connector Types

XLR connector : Pin 2 = hot (+) Pin 3 = cold (-) Pin 1 = GND
 TRS input and output connectors : Tip = hot (+) Ring = cold (-) Sleeve = GND
 RCA PHONO pin connectors

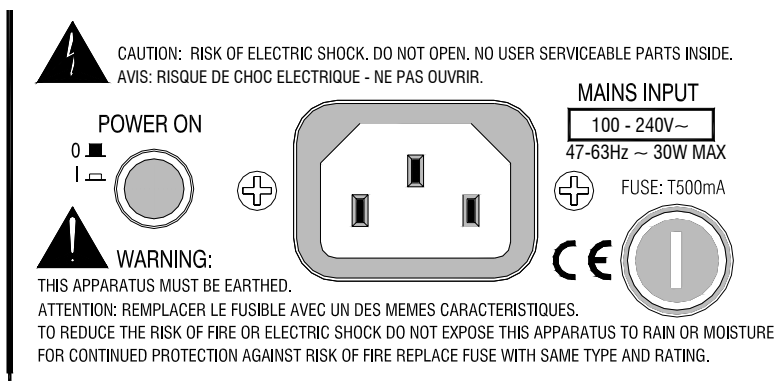
Input Connections

	Type	Impedance	Sensitivity
MIC IN	Balanced XLR female	2k ohm	-45 to -15dBu
Stereo LINE IN	RCA phono	>10k ohm	-15 to +15dBu
Stereo PHONO IN	RCA phono RIAA	47kohm/330pF	2 to 100mV

Output Connections

	Type	Impedance	Level
MIX OUT L,R	Electronically balanced TRS jack	<75 ohm	0dBu
BOOTH OUT L,R	Impedance balanced TRS jack	<75 ohm	-2dBu
AUX OUT L,R	Impedance balanced TRS jack	<75 ohm	-2dBu
RECORD OUT L,R -10dBV	RCA phono		<600 ohm
HEADPHONES	Tip = L Ring = R	30 to 600 ohm, 70 ohms recommended	

Installation



Connecting Mains Power Read the SAFETY INSTRUCTIONS printed at the front of this Service Manual and on the rear panel. Check that the correct mains lead with moulded plug has been supplied with your console. The power supply accepts 50/60Hz AC mains voltages within the range 100-240V without changing any fuses or settings.

It is standard practice to turn connected power amplifiers down or off before switching the console on or off. This prevents any audible switch-on thumps. Ensure that the IEC mains plug is pressed fully into the rear panel socket before switching on.

Earthing

The connection to earth (ground) in an audio system is important for two reasons:

1. **SAFETY** - To protect the operator from high voltage electric shock, and
2. **AUDIO PERFORMANCE** - To minimise the effect of earth (ground) loops which result in audible hum and buzz, and to shield the audio signals from interference.



For safety it is important that all equipment earths are connected to mains earth so that exposed metal parts are prevented from carrying high voltage which can injure or even kill the operator. It is recommended that the system engineer check the continuity of the safety earth from all points in the system including microphone bodies, turntable chassis, equipment cases, and so on.

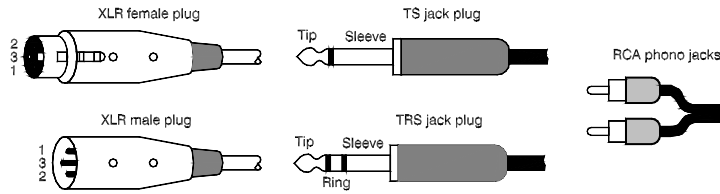
The same earth is also used to shield audio cables from external interference such as the hum fields associated with power transformers, lighting dimmer buzz, and computer radiation. Problems arise when the signal sees more than one path to mains earth. An 'earth loop' (ground loop) results causing current to flow between the different earth paths. This condition is usually detected as a mains frequency audible hum or buzz.

To ensure safe and trouble-free operation we recommend the following:

- **Have your mains system checked by a qualified electrician** If the supply earthing is solid to start with you are less likely to experience problems.
- **Do not remove the earth connection from the console mains plug** The console chassis is connected to mains earth through the power cable to ensure your safety. Audio 0V is connected to the console chassis internally. If problems are encountered with earth loops operate the audio 'ground lift' switches on connected equipment accordingly, or disconnect the cable screens at one end, usually at the destination.
- **Make sure that turntables are correctly earthed** A chassis earth terminal is provided on the console rear panel to connect to turntable earth straps.
- **Deal with ground loops** Should you experience hum or buzz caused by ground loops, check first that each piece of equipment has its own separate path to ground. If so, operate ground lift switches on connected equipment in accordance with the instruction manuals. Alternatively disconnect the cable screen at the destination end only. This breaks the offending loop while still maintaining the signal shielding down the length of the cable.
- **Use low impedance sources** such as microphones and line level equipment rated at 200 ohms or less to reduce susceptibility to interference. The console outputs are designed to operate at very low impedance to minimise interference problems.
- **Use balanced connections for the microphone and main outputs** as these provide further immunity by cancelling out interference that may be picked up on long cable runs. Refer to the cable drawing for information on how to connect balanced and unbalanced equipment.
- **Route cables to avoid interference** To avoid interference pickup keep audio cables away from mains power units and cables, thyristor dimmer units or computer equipment. Where this cannot be avoided, cross the cables at right angles to minimise interference.
- **Use good quality cables and connectors** and check for correct wiring and reliable solder joints. Allow sufficient cable loop to prevent damage through stretching.

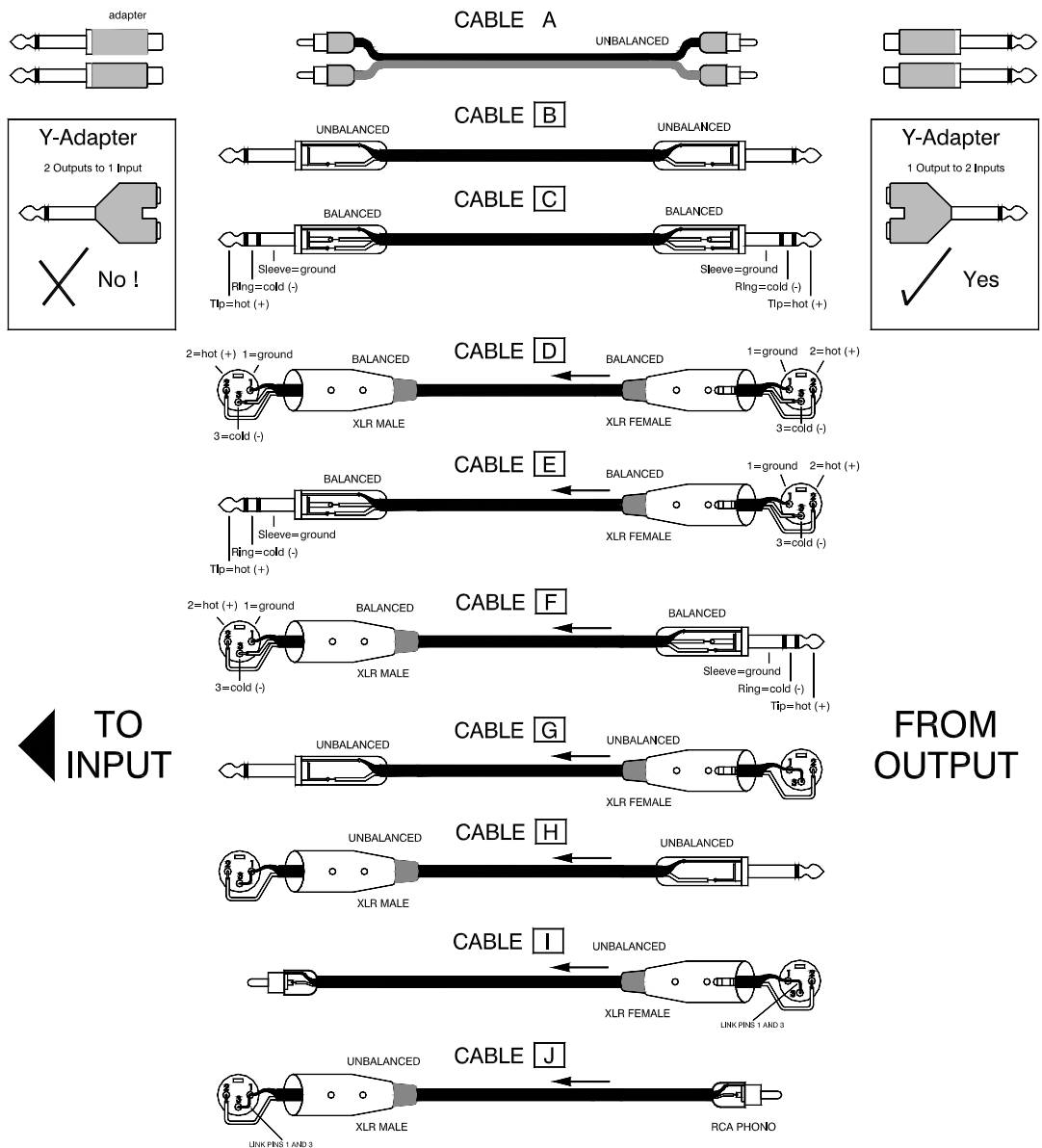
Cables and Connections

The **XONE:32** uses professional grade 3 pin XLR, 1/4" TRS jack and RCA PHONO sockets. The following mating plugs may be used:



The microphone input **XLR** connector is 3 wire balanced. This has 3 connector pins: Pin 1 = ground (screen), Pin 2 = signal hot (+), Pin 3 = signal cold (-). The jack sockets are the 3 pole **TRS** type. These are wired to work with either the balanced TRS or the unbalanced 2 pole TS type plugs without cable modification. The sockets have 3 connector pins: Inputs and outputs are Tip = signal hot (+), Ring = signal cold (-), Sleeve = ground (screen). Headphones are Tip = left, Ring = right, Sleeve = ground. The **RCA** phono connectors are 2 wire unbalanced to connect to equipment such as CD players, turntables and domestic amplifiers.

To ensure best performance, we recommend that you use high quality audio cables and connectors, and take time to check for reliable and accurate cable assembly. It is well known that many audio system failures are due to faulty interconnecting leads. Avoid reversing + and - on balanced connections as this will result in reverse polarity connections which may cause signal cancellation effects. Refer to the cable diagram for how to wire unbalanced to balanced connections. **It is fine to use a Y-adapter to feed one output to several inputs, but never use a Y-adapter to sum two outputs into one input.**



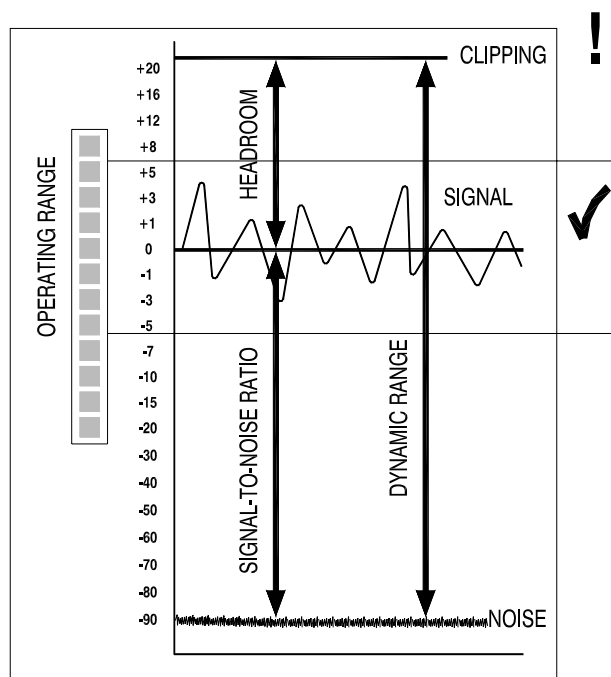
Gain and Operating Levels

From the User Guide:

It is most important that the system gain and level settings are correctly set. It is well known that many DJs push the gain to maximum with meters peaking hard in the belief that they are getting the best from the system. **THIS IS NOT THE CASE !** The best can only be achieved if the system levels are set within the normal operating range and not allowed to peak. Peaking simply results in signal distortion, not more volume. It is the specification of the amplifier / speaker system that sets the maximum volume that can be achieved, not the console. The human ear too can fool the operator into believing that more volume is needed. Be careful as this is in fact a warning that hearing damage will result if high listening levels are maintained. Remember that it is the **QUALITY** of the sound that pleases the ear, not the **VOLUME**.

Use the **LEVEL TRIM** to match the input source to the normal operating level of the console. Adjust this so that the **CHANNEL METER** averages 0dB with loudest moments reading +5. Press the **CUE SWITCH** to listen to the signal on headphones. Adjust the **CHANNEL FADER** and **MASTER LEVEL** so that they normally operate in the near the top of travel. Make sure the amplifier/speaker system has been correctly calibrated for the loudest volume required at the fader top position. Boosting the EQ also adds gain to the system. Reduce by turning back the **LEVEL TRIM** if the meter red peak LEDs flash. Adjust the **HEADPHONES** and **BOOTH** monitor controls for safe listening levels.

The diagram illustrates the operating range of the audio signal.



NORMAL OPERATING RANGE. For normal music the signal should range between -5 and $+5$ on the meters with average around 0dB. This allows enough **HEADROOM** for unexpected peaks before the signal hits its maximum **CLIPPING** voltage and distorts. It also achieves the best **SIGNAL-TO-NOISE-RATIO** by keeping the signal well above the residual **NOISE FLOOR** (system hiss). The **DYNAMIC RANGE** is the maximum signal swing available between the residual noise floor and clipping. The **XONE:32** provides a massive 108dB dynamic range.

A final note ... The human ear is a remarkable organ with the ability to compress or 'shut down' when sound levels become too high. Do not interpret this natural response as a reason to turn the system volume up further ! As the session wears on ear fatigue may set in, and the speaker cones may become hot so reducing the effectiveness of the system and listeners to gain any benefit from increased volume.

BE SENSIBLE, BE SAFE WITH SOUND LEVELS



Order Codes

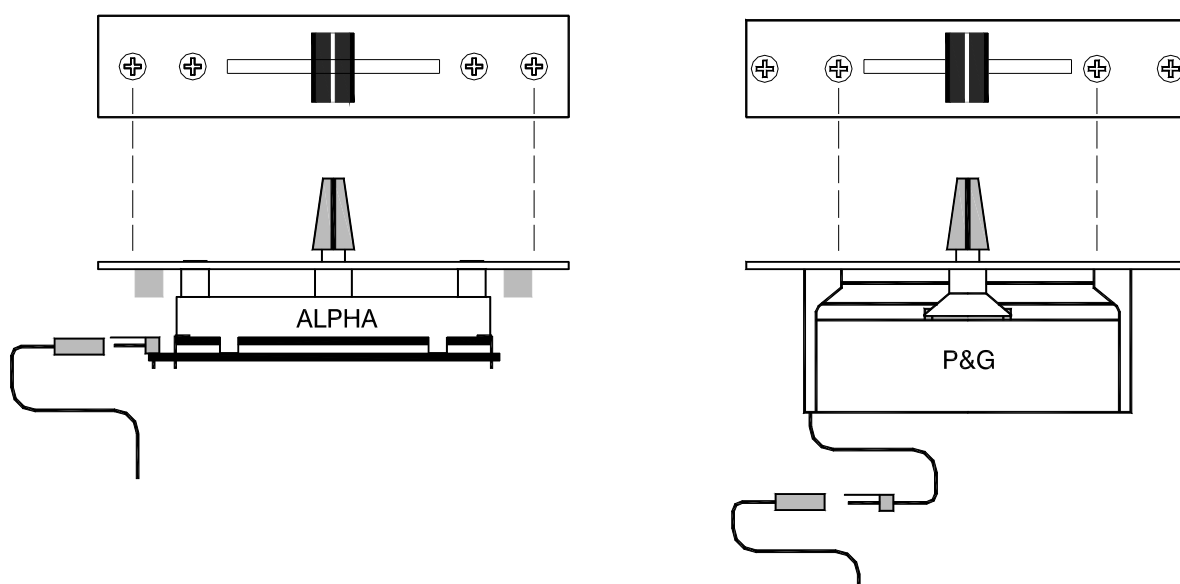
The following products and parts can be ordered from Allen & Heath or the approved dealer:


XONE:32/v	XONE:32 3 stereo channel mixer	/v = specify voltage
XONE2:62/v	XONE:62 6 stereo channel mixer	/v = specify voltage
XONE2:464/v	XONE:464 4 mic 6 stereo channel mixer	/v = specify voltage
002-684	60mm Stereo Channel Fader for XONE:32, 62 & 464	
002-719	Optional P&G crossfader for XONE:32, 62 & 464	
002-720	Standard crossfader for XONE:32	
002-722	30mm Cue/Mix fader for XONE:32	
002-723	60mm VCF/LFO depth fader for XONE:32	
XONE:32-RK	Plinth mounting rack ear kit	
AP4264	XONE:32 User Guide	
AP4265	XONE:32 Service Manual	

Replacing the Crossfader

The crossfader on a DJ mixer is heavily used and can suffer considerable wear and tear. The audio design using VCAs prevents clicks and scratchiness as the fader wears. However, the movement can become mechanically stiff or sloppy in time, or become ingrained with dirt. Should this be the case the fader may need replacement. The **XONE:32** crossfader is removable and can easily be replaced in a few minutes. There are two versions available, the standard type and the higher grade Penny & Giles type. Make sure you order the correct version from Allen & Heath.


Use a medium size cross-point (Pozidriv) screwdriver to undo and remove the two outer screws on the crossfader plate. Do not remove the inner screws. Lift the crossfader assembly up and away from the console panel. Unplug the cable from the old crossfader and plug in the new assembly. Check that the connector is correctly aligned and pushed on. Replace the assembly making sure the cable faces the left side of the console. Refit the screws and test operation.





 For your safety do not remove the **EARTH** (ground) connection in the power lead of the console or connected equipment.


☺ Have your **MAINS SYSTEM** checked by a qualified electrician. If the earthing is solid to start with you are less likely to experience problems.


☺ Use high grade **AUDIO CABLES** and check them for reliable connection. It is well known that many audio system problems are due to faulty cables and connectors.

 In a club or similar installation strict **SOUND LEVEL** and noise regulations may apply. Check that your system levels are correctly set up to comply.

 To avoid damage to your hearing start with the **HEADPHONES** level control at minimum and turn up only as much as is needed to maintain comfortable listening level. Do not drive headphones at high listening levels for long periods of time.

 Always switch connected **AMPLIFIERS** on last and off first to avoid thumps when the console and connected equipment is turned on or off.

 Reduce gain if the red meter **PEAK** led flashes. These warn you that you are near clipping which may result in system overload and distortion. The **XONE:32** provides plenty of drive and headroom when operated around the 0 to +5 meter points. Check that the amplifier / speaker system is correctly matched and set up for correct levels.

 Increasing **VCF RESONANCE** boosts a narrow band of selected frequencies. Make sure you reduce the channel gain if the red peak meters start to flash. It is best to start experimenting with this control set to minimum.

☺ **If you suspect a console fault.** The console is the heart of the audio system and is often suspected faulty when a problem occurs. Usually the fault is found to be with other equipment in the system, typically the interconnecting leads, input sources, or level matching between equipment. Check for source problems by unplugging each channel in turn listening for a change in symptom. To check the console, isolate it by unplugging all sources and outputs leaving just headphones and a reference source such as a CD player connected.

? **I have plugged in a microphone but it does not work.** The **XONE:32** is designed to operate with non-phantom powered dynamic microphones such as the popular vocal types. Do not use microphones which require phantom power. If it has an on/off switch check that it is turned on. Make sure the front panel **GAIN** control is turned up.

? **The signal sounds very distorted with high level and excessive bass.** Only plug turntables needing RIAA equalisation into the **PHONO** inputs. Other equipment should be plugged into the **LINE** inputs.

? **There is a hum on the turntable channels.** Check that the turntable earth strap has been correctly connected to the console chassis earth post. Also check that the turntable headshell and cartridge are correctly aligned and plugged in.

? **The output meter reads fine but the signal is distorted.** Check the channel meter to make sure it is not peaking red. If it is, the output meter may still read fine if the fader or master level control is not set fully up. Reduce the input level trim if the channel meter reads too high.

? **Only one side of the stereo mix is working.** Check that the **BAL** control is not set fully to either L or R. Also check for bad connections, in particular RCA phono leads and turntable headshell and cartridge pins.

? **There is feedback.** Check that the microphone is not placed next to the headphones or loudspeakers. The mic may pick up its own signal and feed back. In loud listening conditions feedback can sometimes be caused by mechanical vibration through the turntables into the cartridge, or even the needle resting on a cued turntable starting to resonate in the groove of the record.

? **When the VCF is switched on there is very little sound.** Operate the VCF frequency slider to restore the frequency content of the sound.

? **The LED is flashing but the LFO is not working.** Check that the LFO is turned on and its LED is green, flashing red to indicate speed. The LED always flashes red whether it is on or off.

? **I tap in the tempo but the LED flashes too fast.** The x2 has been switched on.

? **There is no cue signal.** Check that the **CUE/MIX** slider is not set fully right for mix only.

? **There is no channel signal.** Check that the rear panel input selector switch is correctly set.

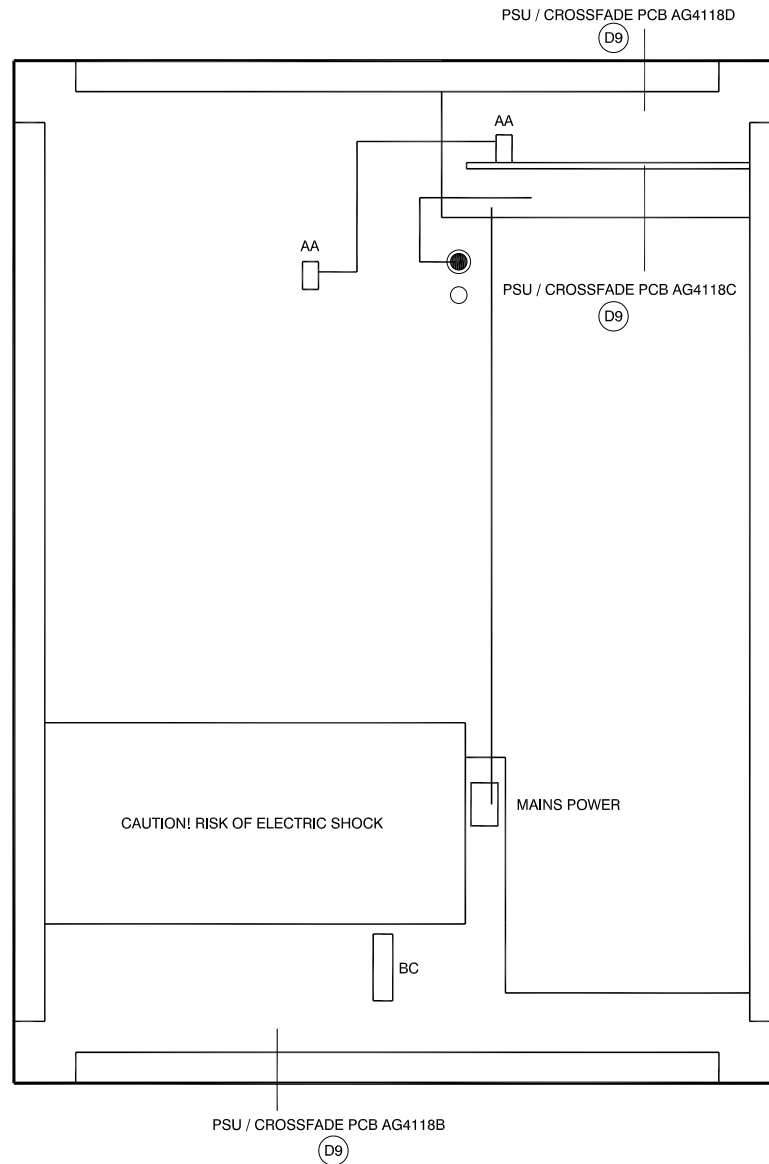
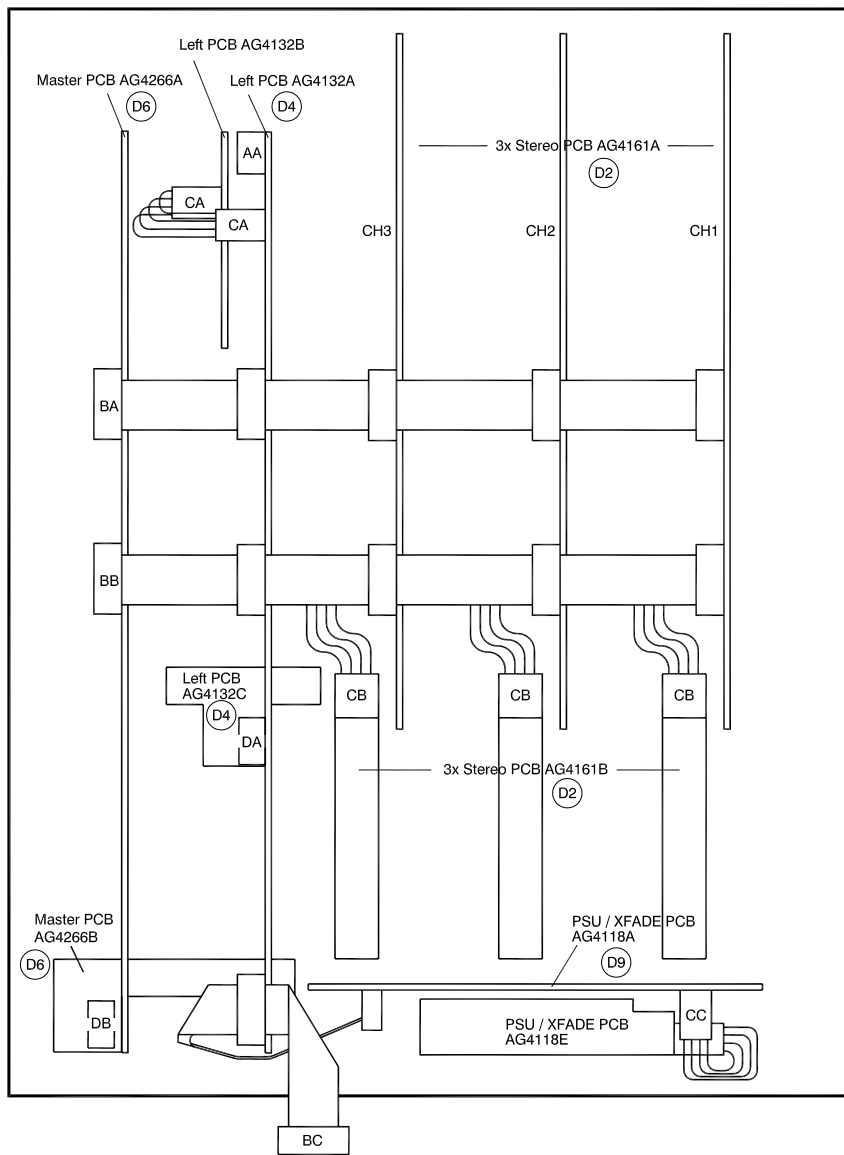
? **The crossfader is not working.** Make sure the crossfader is turned on and its front panel green LED lit.

? **The crossfader works backwards.** Check that the reverse switch has not been pressed and its red LED on. If it is off then check that the crossfader has been re-fitted the right way round if previously removed.

? **I have connected a stereo source to a single input using a Y-adaptor but it sounds bad.** Do not connect more than one output to the input. These adaptors are designed to feed one output to two inputs, not the other way round.

? **The switch settings are different when I switch the console on.** The settings always return to default on power up. You can store preferred settings in the user presets and select one of these after power up.

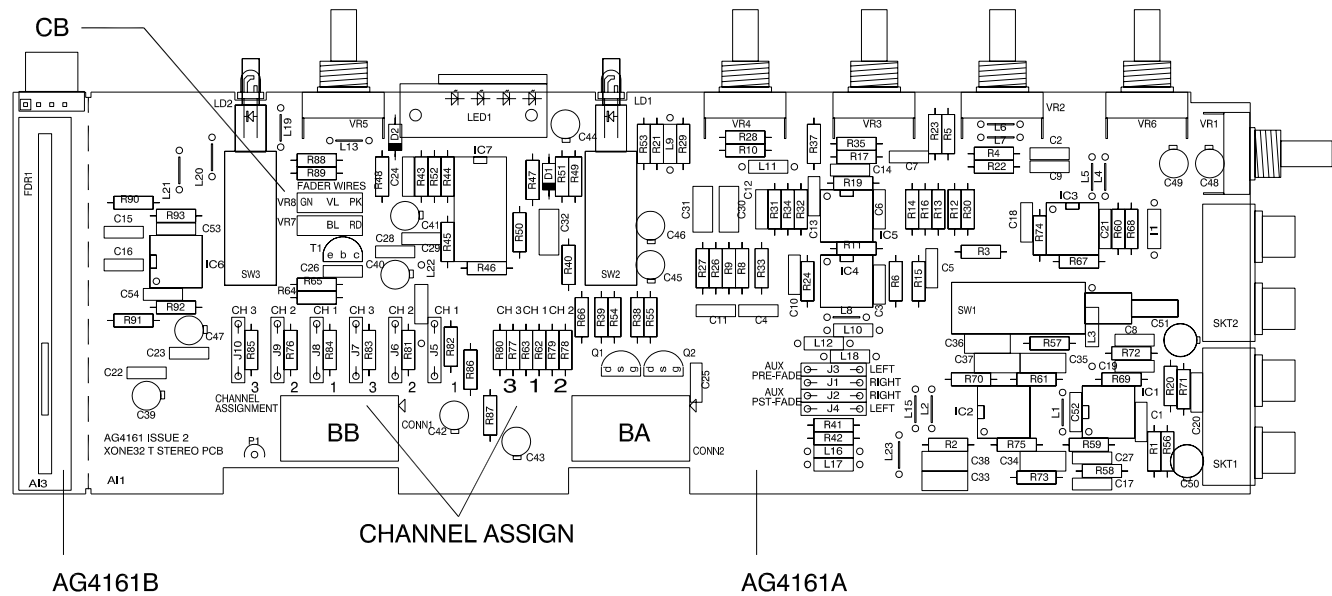
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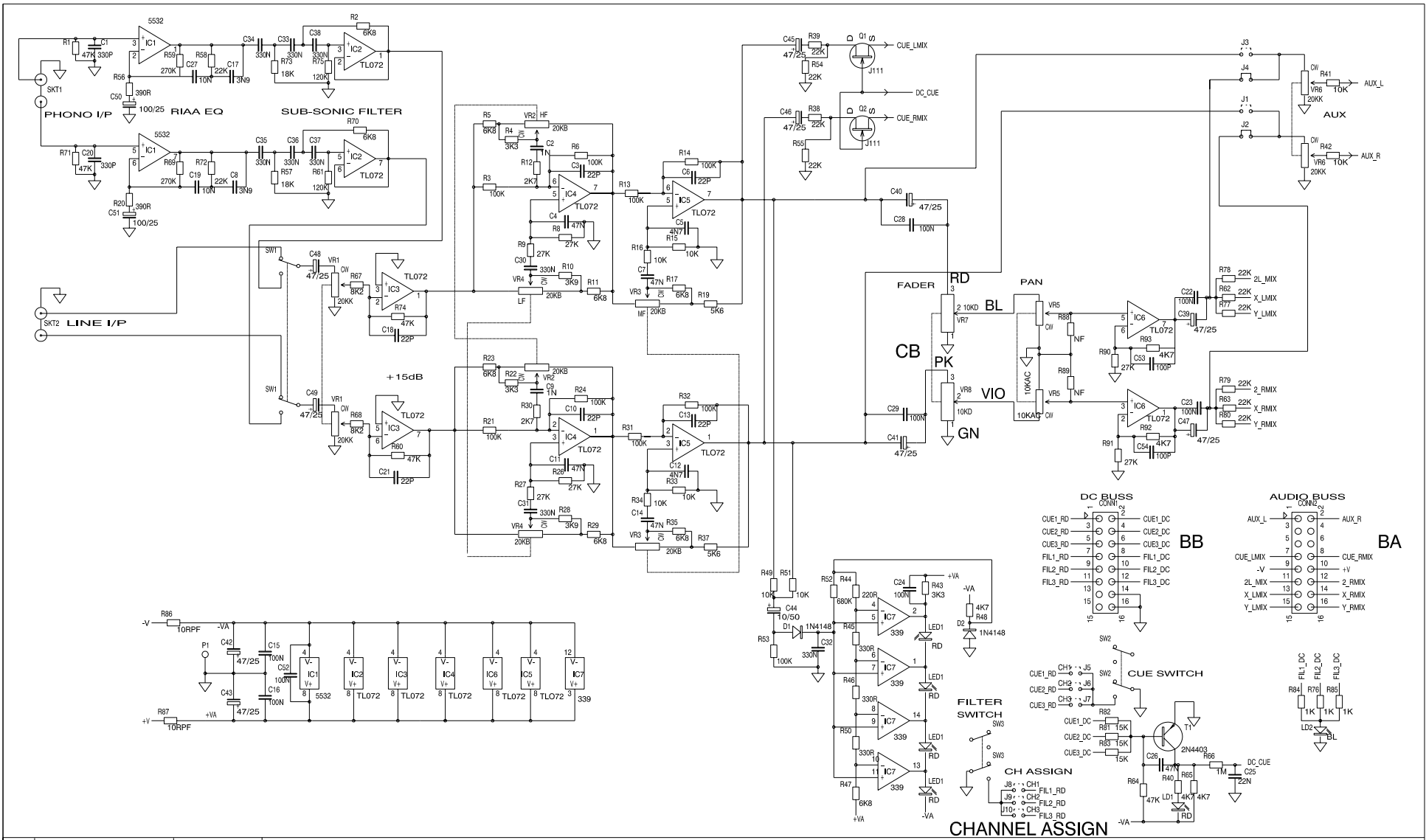
XONE:32
 INTERNAL LAYOUT

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 England, TR10 9LU
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XONE:32
STEREO INPUT PCB
 AG4161 issue 2

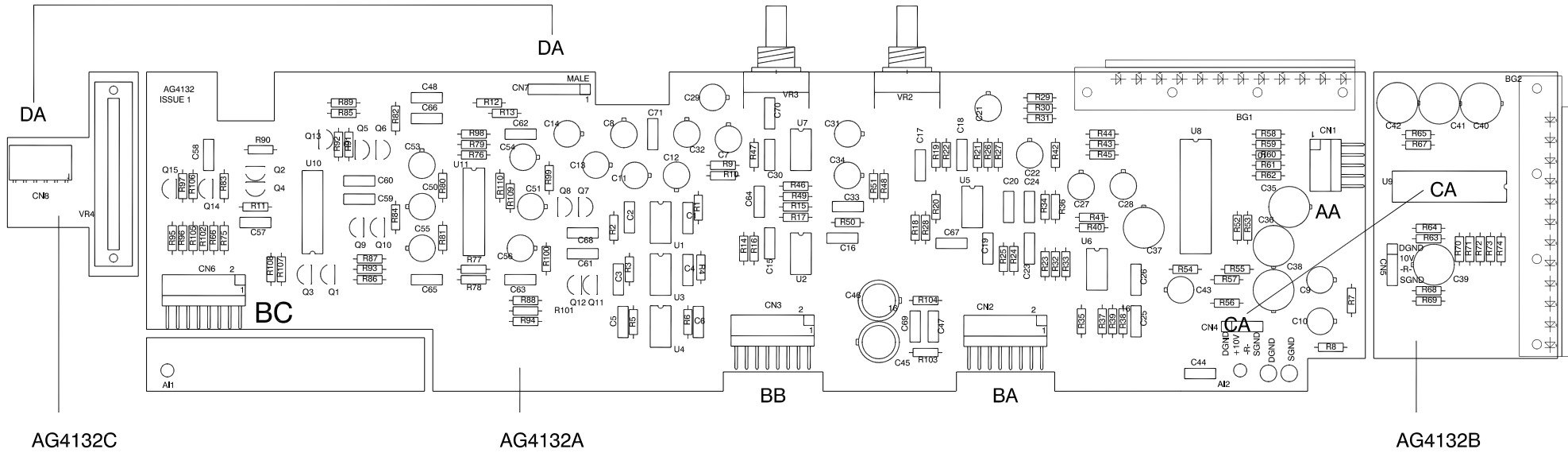


ISS.	REVISION	BY DATE
1	CANCELLED	
2	PHASE CORRECTION	ARJ 15-12-00

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XONE:32
 STEREO INPUT CIRCUIT
 C4161 issue 2

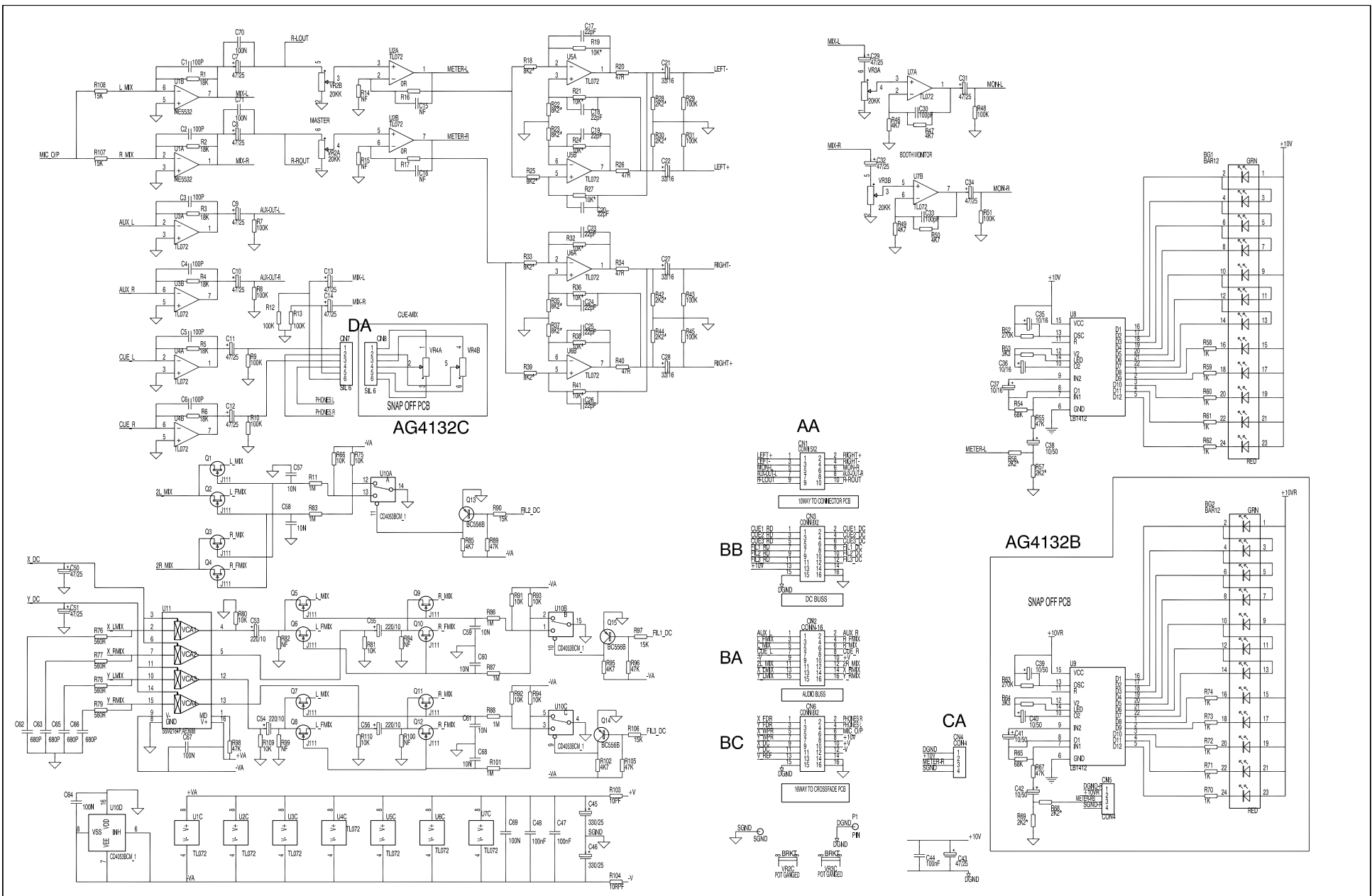
h
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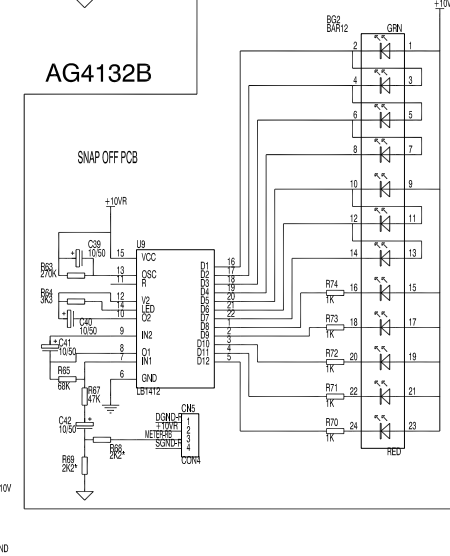
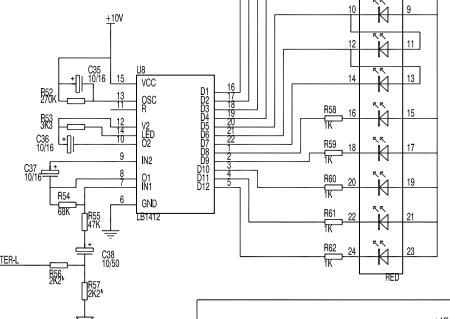
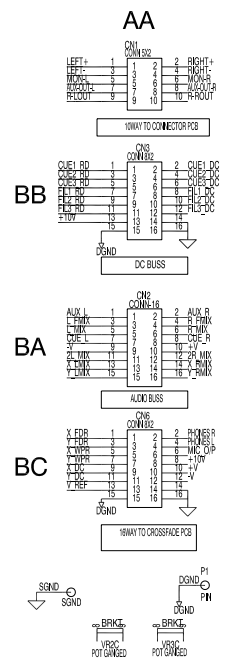
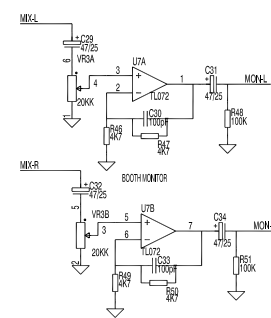
XONE:32
 LEFT PCB
 AG4132 issue 1

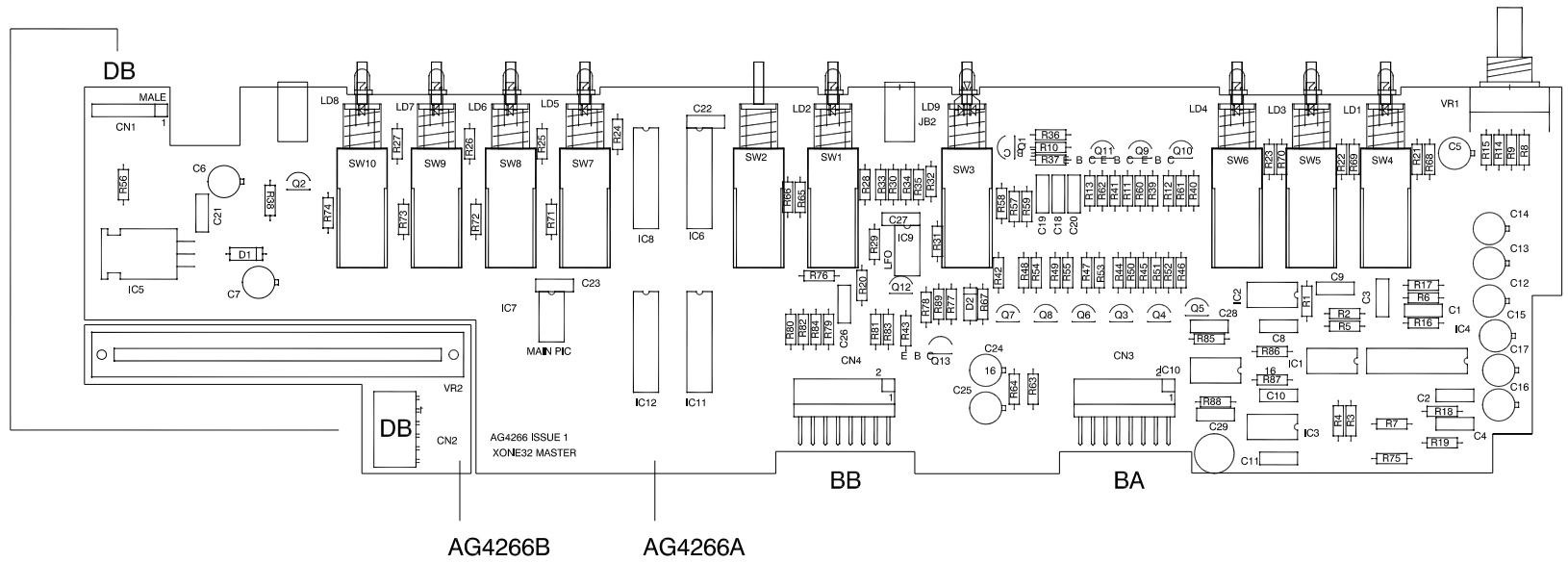
A B C D E F G H



ISSUE	BY	DATE
1	ARJ	08-12-00

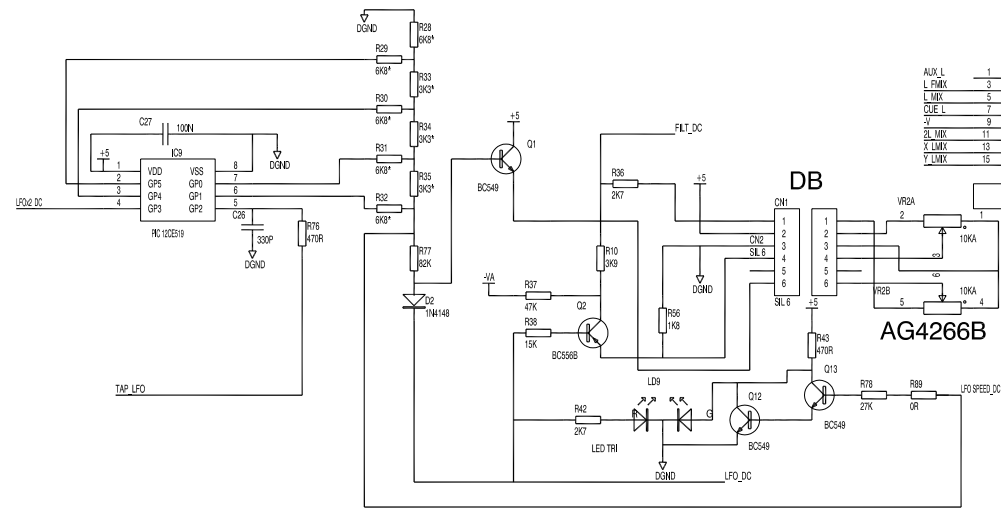
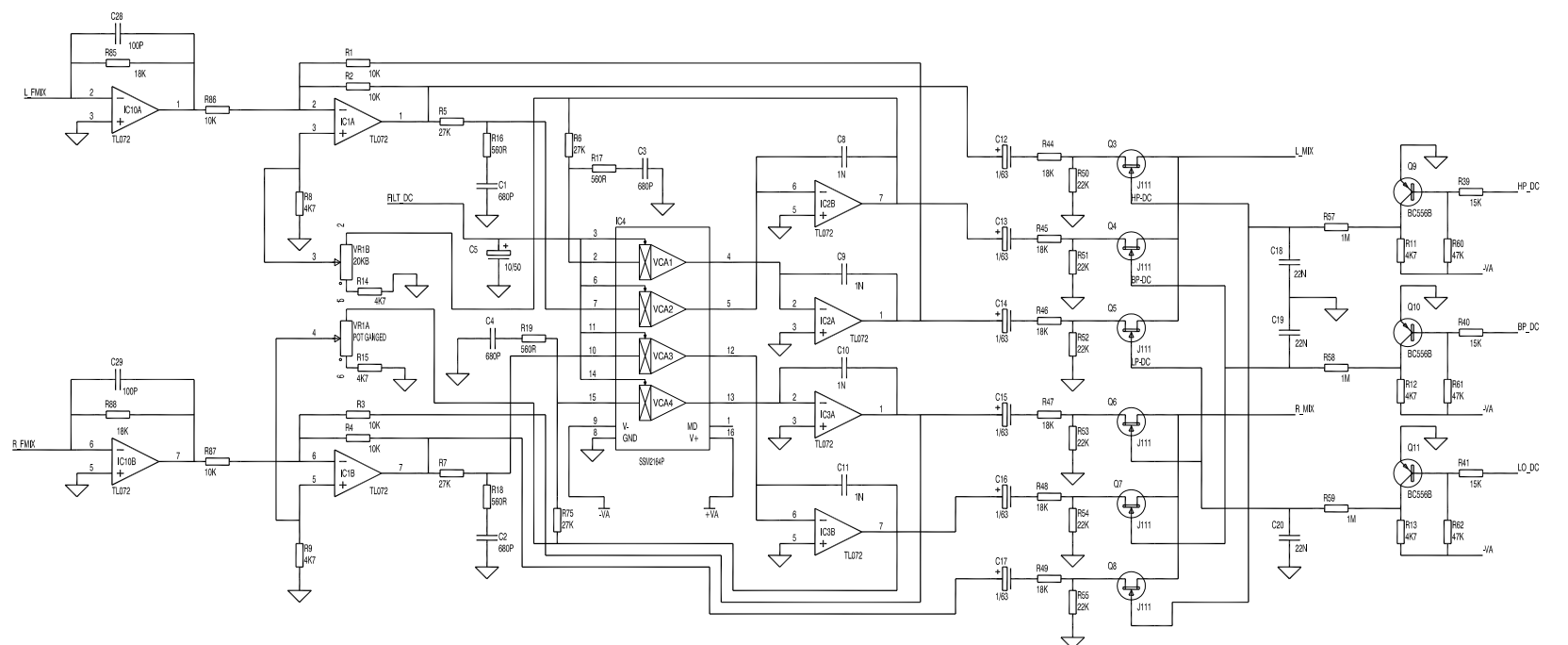
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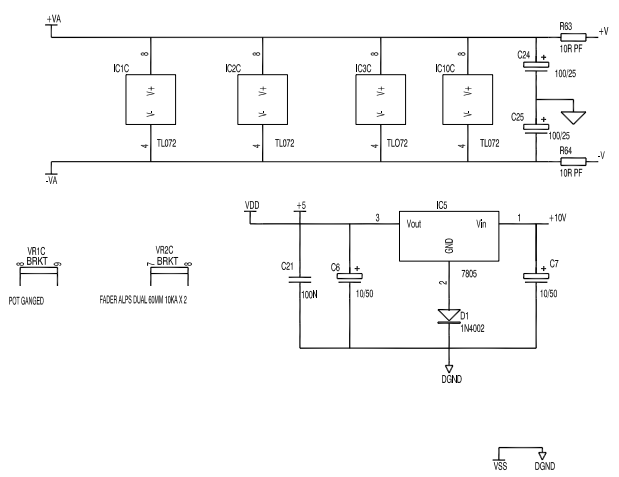
XONE:32
 MASTER PCB
 AG4266 issue 1



BA

CN3
CONN-16

AUX_L	1	2	AUX_R
L_FMIX	3	4	R_FMIX
L_LMX	5	6	R_LMX
CUE_L	7	8	CUE_R
L	9	10	-V
R_LMX	11	12	R_LMX
X_LMX	13	14	X_FMIX
Y_LMX	15	16	V_FMIX

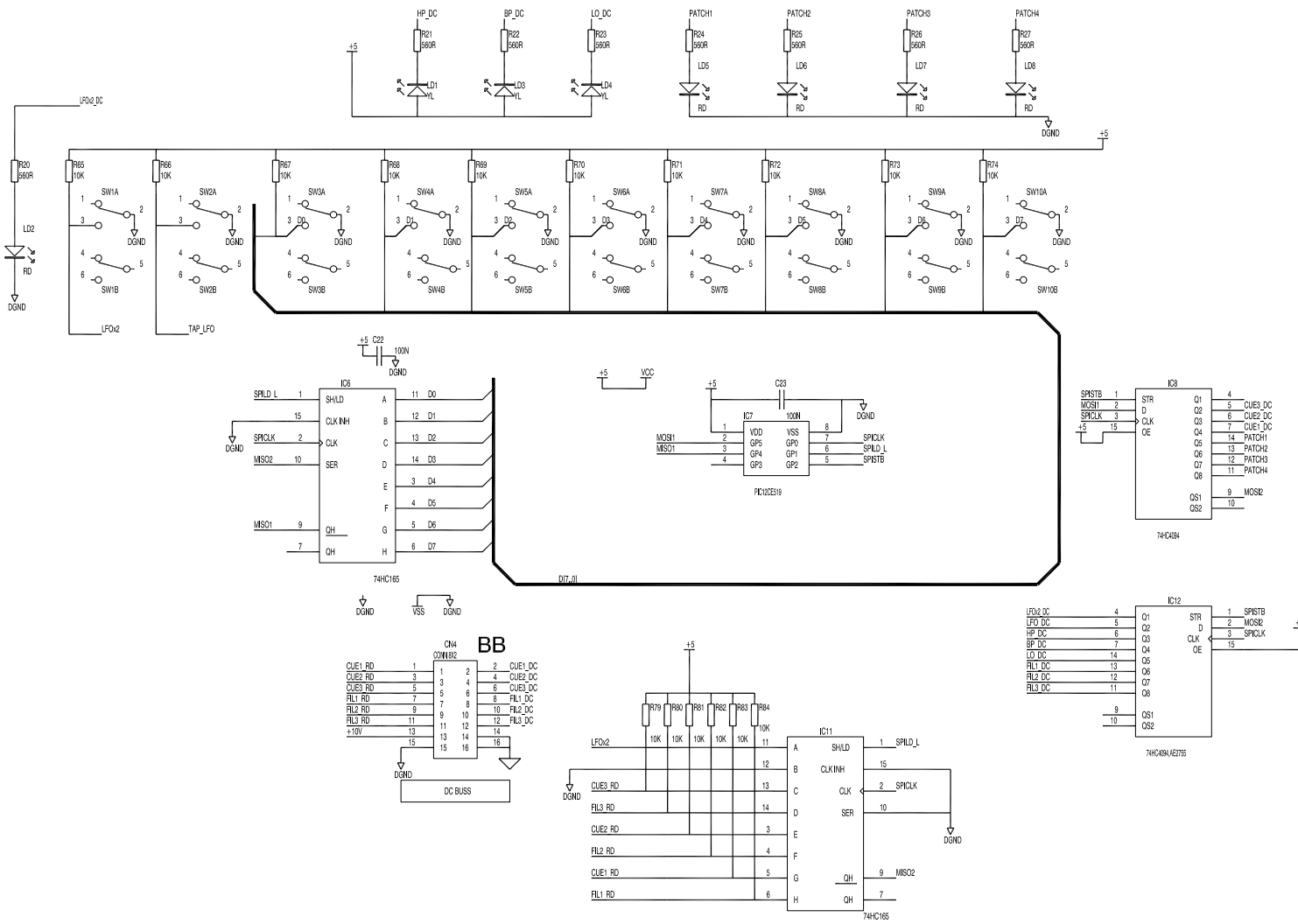


ISSUE	BY	DATE
1	ARJ	8-12-00

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XONE:32
MASTER CIRCUIT
 C4266 issue 1 SHEET 1 of 2

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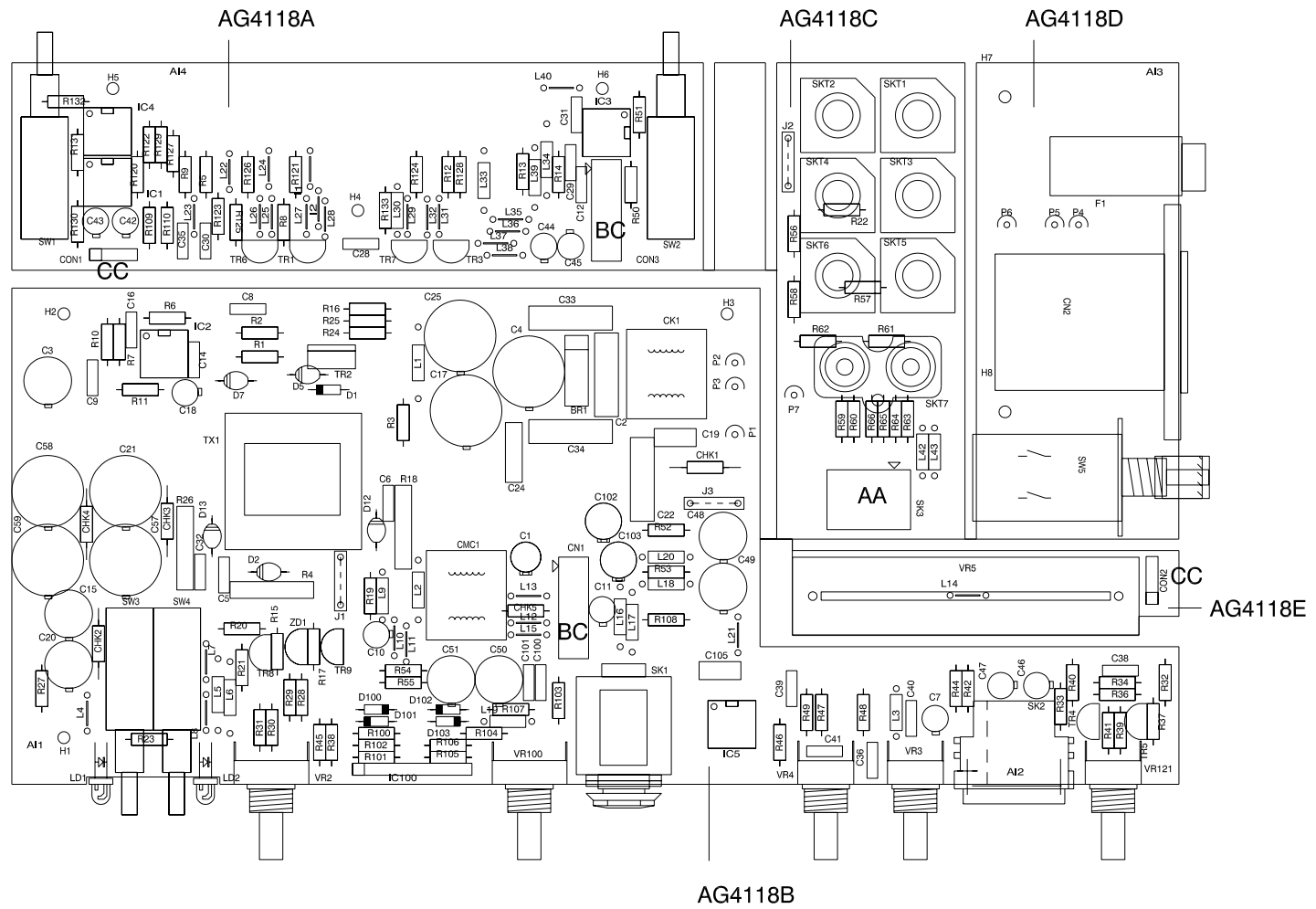


ISSUE	BY	DATE
1	ARJ	8-12-00

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XONE:32
MASTER CIRCUIT
 C4266 issue 1 SHEET 2 of 2

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XONE:32
 PSU / CROSSFADE PCB
 AG4118 issue 2

A

B

C

D

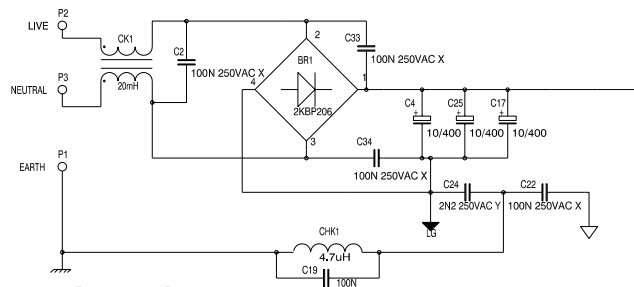
E

F

G

XONE:32 SERVICE MANUAL

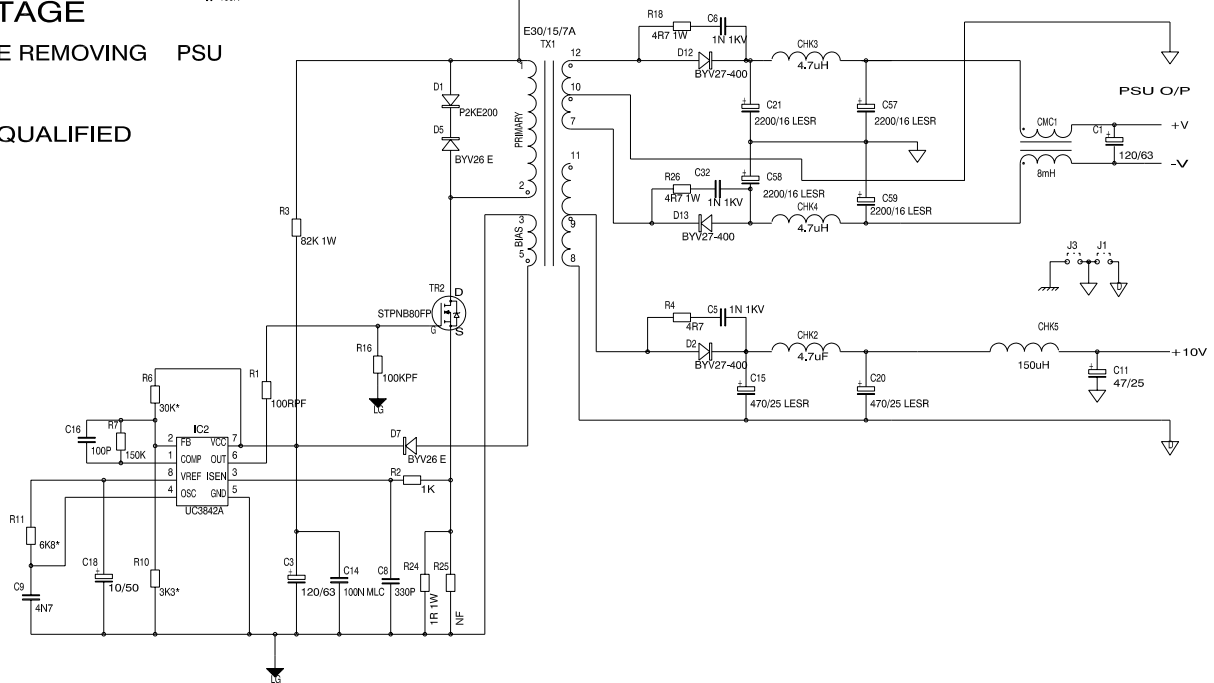
D9



DANGER - HIGH VOLTAGE
 DISCONNECT POWER BEFORE REMOVING PSU

REFER SERVICE WORK TO QUALIFIED
 SERVICE PERSONNEL ONLY

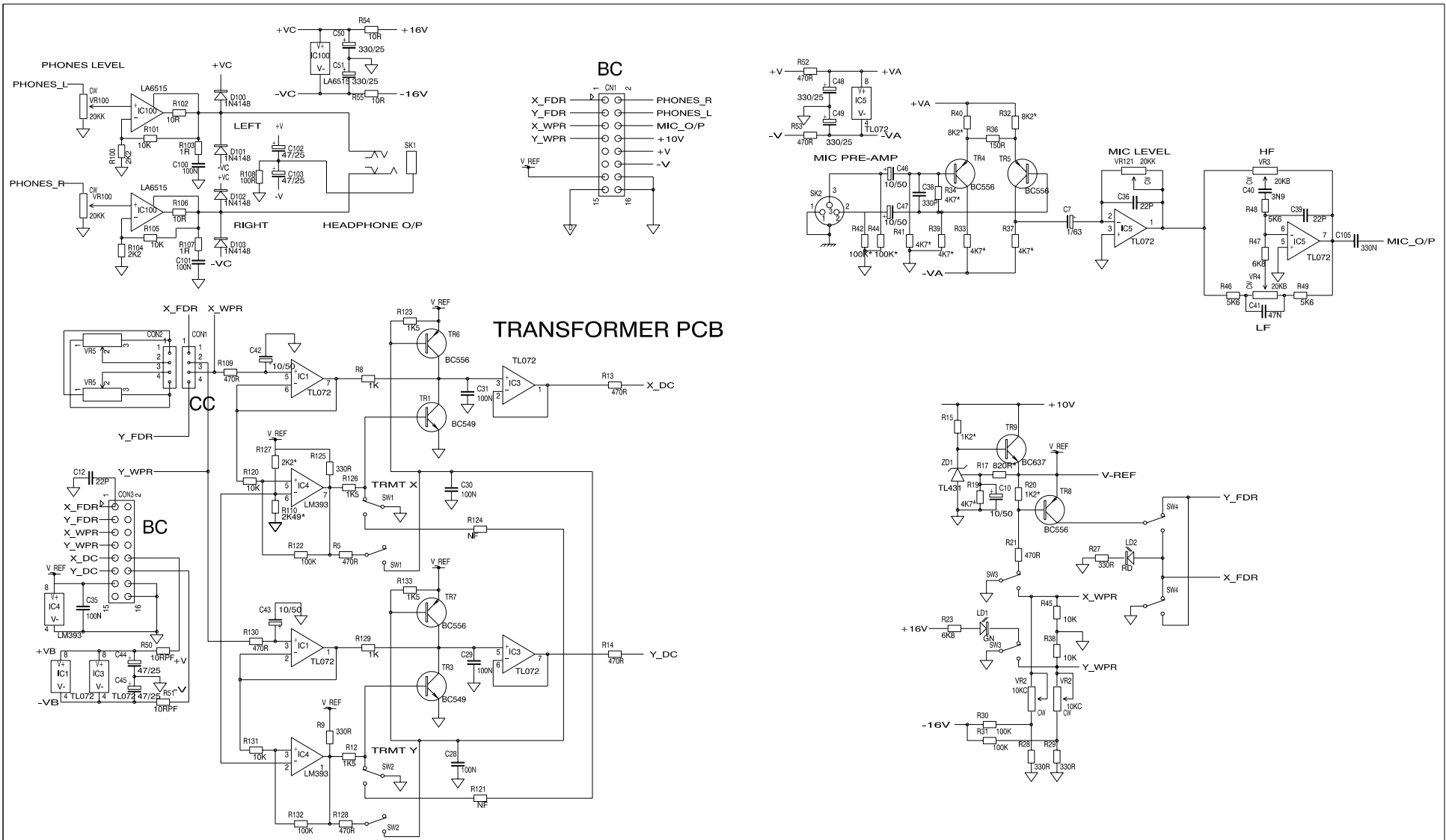
SWITCHING POWER SUPPLY



ISS.	REVISION	BY DATE
1	PRODUCTION	ARJ 10-10-00
2	C12 ADDED	ARJ 10-1-01

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XONE:32
 PSU / CROSSFADE CIRCUIT
 C4118 issue 2 SHEET 1 of 3

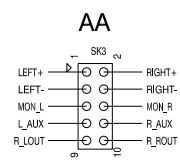
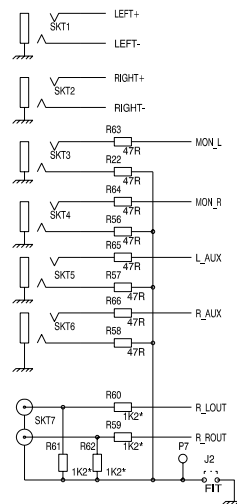
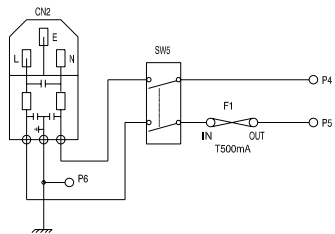


ISS.	REVISION	BY DATE
1	PRODUCTION	ARJ 10-10-00
2	C12 ADDED	ARJ 10-1-01

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XONE:32
 PSU / CROSSFADE PCB
 C4118 issue 2 SHEET 2 of 3

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ISS.	REVISION	BY DATE
1	PRODUCTION	ARJ 10-10-00
2	C12 ADDED	ARJ 10-1-01

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XONE:32
 PSU / CROSSFADE PCB
 C4118 issue 2 SHEET 3 of 3