

THE GS3-MB8 MULTITRACK BALANCE OPTION

The **GS3-MB8** balance option is a kit of parts which is fitted into the **GS3** or **GS3V** console to balance 8 channel **GRP/DIR OUT** and **TAPE IN** connectors. For 16-track multitracks two kits are required, 24-track three kits etc. Each kit contains 8 small circuit assemblies and wiring harnesses, one per channel.

Access is required to the console internal assemblies. Circuit board track modification and soldering is necessary. **THIS WORK SHOULD ONLY BE CARRIED OUT BY TECHNICALLY QUALIFIED PERSONNEL.**

POWER SUPPLY CONSIDERATIONS - IMPORTANT NOTE !

The standard **GS3** console is powered by the external power unit type **MPS9**. This operates near its maximum capability when powering the largest console in the range, the 32 channel **GS3V**. Each **MB8** circuit assembly draws around 12mA current (a set of 8 needs 100mA). For **GS3V-32** consoles with more than 8 channels of balance option fitted (1x **MB8** kit) the **MPS9** should be replaced with the **ALLEN & HEATH RPS9** or **RPS5** power unit. This may be ordered separately. Consider this also when fitting an expander to a balanced **GS3V-24**. Please state the mains voltage setting required when ordering a replacement power unit.

CIRCUIT DESCRIPTION

Each channel is fitted with a small piggyback circuit assembly. Refer to circuit diagram D209 for the schematic and board layout of this assembly. The console **GRP/DIR OUT** is taken to IC1B which buffers and boosts the signal by 6dB. IC2 is the industry standard **SSM2142** differential balanced driver which provides a further 6dB of boost to bring the console -8dBu (-10dBV) low level signal to the +4dBu high level standard. The output is electronically balanced and fed to the tip (+) and ring (-) connector pins of the output jack socket. The console **TAPE IN** jack socket is reconfigured for tip (+) and ring (-) balanced input fed to IC1A which attenuates the signal by 12dB to provide an unbalanced -8dBu to the console. For consoles previously modified for high level operation or where low level balancing is required, the circuit assemblies may be adjusted for unity gain operation by replacing R1, R2 and R5 and removing R7 as shown on diagram D209. R10,11 and C11,12 filter the DC power input, while diodes D1 and D2 provide protection against reverse voltage.

CHECK THE CONTENTS OF THE KIT :

| | | |
|-----------------------------|-----------|---------------|
| S3 BAL CIRCUIT ASSEMBLY | ZX000-709 | QTY x 8 |
| WIRING HARNESS | ZX000-131 | QTY x 8 |
| SPACER NYLON M3 x 4mm | AB0331 | QTY x 16 |
| SCREW M3 x 12mm PAN POZI | AB0078 | QTY x 16 |
| LOCK NUT M3 | AB0102 | QTY x 16 |
| ADHESIVE LABEL (-10 BAL +4) | AN0394 | QTY x 1 block |
| THESE FITTING INSTRUCTIONS | AP0206 | QTY x 1 |

Fitting the **MB8** option requires removal of the base and part of the chassis assembly, small channel circuit board track cuts and component adjustments, assembly of the piggyback circuit boards using the spacers, screws and nuts, soldering of harnesses to the channel boards, testing of the signal level and balance function, re-assembly of the console, and fitting of the adhesive connector labels. We recommend that this work is carried out in a well lit service workshop on a suitably sized clean work surface protected to prevent cosmetic damage to the console.

TOOLS REQUIRED :

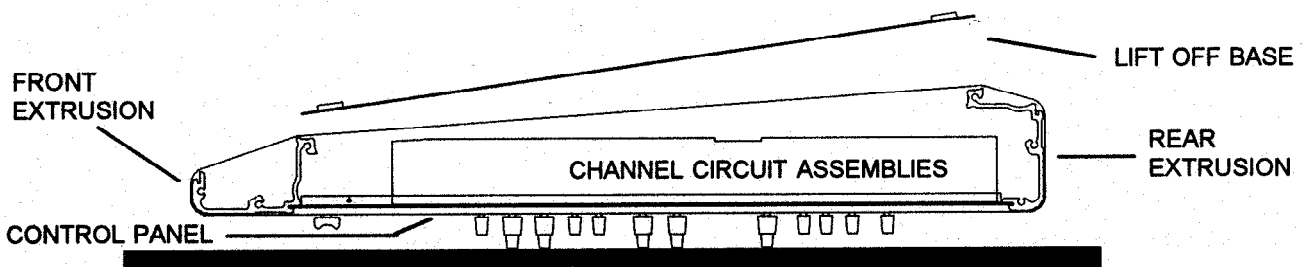
2 point cross head screwdriver
4mm hexagon Allen key
Long Nose Pliers
M3 open ended spanner
Printed circuit track cutting tool
Fine tip soldering iron

ACCESS TO THE CHANNEL ASSEMBLIES

BEFORE YOU START OBSERVE THESE PRECAUTIONS: Make sure your work surface is clear of dirt and debris which may damage the cosmetic finish of the console. It is best to place a clean table cloth or foam sheet over the work surface first. Avoid balancing the console on any one of its corners as this may damage the trim. Retain all removed fixing screws and components in a safe place for reassembly.

To gain access to the internal assemblies remove the flat steel base and the rear extrusion. If channels 1 to 8 are to be modified the adjacent side trim will also need to be removed. Please note that the front panel is only retained in position by slotting into the extrusions, so that when the rear extrusion/side trim assembly is removed great care must be taken not to dislodge the control panel from the front extrusion. Proceed as follows:

1. Disconnect the power supply and all cables from the console.
2. Place the console upside down on a suitable flat work surface.
3. Remove the base plate screws using a 2-point crosshead screwdriver. Lift off the base.

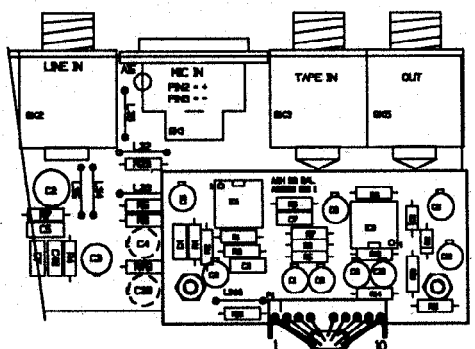


4. Using a 4mm hexagon key remove the 6 large screws retaining the rear extrusion to the side trims. Carefully slide the extrusion away from the control panel to gain access to the rear of the channel circuit assemblies. Do not stretch the green earth wire attached to the extrusion.
5. This instruction applies only if you are fitting the option to channel 1. Remove the side trim nearest the channels to gain access to the channel 1 circuit assembly. Remove the 3 large screws holding this side trim to the front extrusion. Support the front extrusion to prevent it slipping off the control panel.

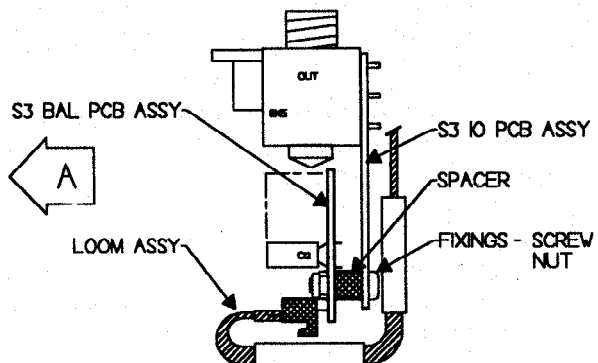
CONFIGURING THE ASSEMBLIES

6. Identify the issue number of the console channel PCBs (PCB AG0308 Issue 1 or Issue 2). This is printed in the tracking behind the jack connectors. Modify these assemblies by cutting the tracks, removing components fitting the option assemblies and soldering on the option wiring harnesses as detailed in the FITTING INSTRUCTION DRAWING D210 sheets 2 and 3.

NOTE: Check the level setting requirement. The option assemblies are set to convert a standard low level (-10dBV) console to balanced high level (+4dBu) operation. For different level settings refer to the circuit diagram D209. Check first that your console has not already been modified for high level operation.



VIEW LOOKING ON COMPONENT SIDE OF BOARDS



VIEW LOOKING IN DIRECTION OF ARROW 'A'

FITTING THE OPTION

To gain maximum screwdriver and soldering access start from the highest number channel down, for example from 8, 7, 6 to 1, or 16, 15, 14 to 9 etc.

Fit the option **BAL PCB AG0316** to the channel assembly using the 2 screws, spacers and nuts provided in the kit.

Next plug on the **CABLE HARNESS** connector ensuring correct orientation. The connector ears should face out from the PCB. Bend the cable down under the IO PCB and fan the wires to their destination pads according to drawing D210.

Solder the wires ensuring good joints.

Check your work for accuracy. Remove any wire clippings or solder debris.

7. Refit the side trim and then the rear extrusion ensuring front panel is seated correctly.

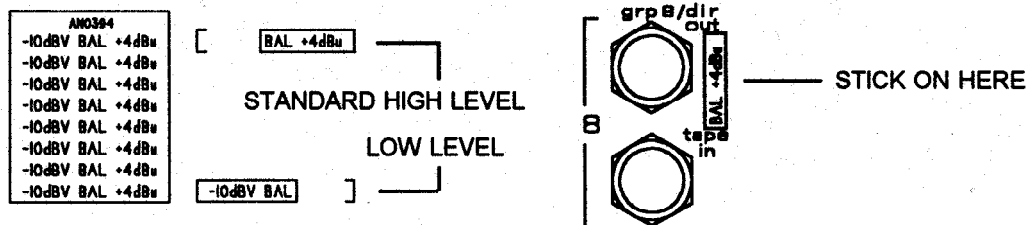
8. Refit the base. Note the correct orientation, i.e. the foam strips line up with the **SLAVE** assembly positions.

PRECAUTION: Do not cross thread or overtighten the base screws. These self tap into the aluminium extrusions and steel side brackets.

FITTING THE LABELS

A self-adhesive label block is provided to identify the channels which have been modified. This is important in cases where not all the channels have been modified. You may have a 24 channel console and wish to balance only 16 channels to work with your 16-track multitrack recorder. The label also indicates the operating level of the balanced connections. The standard setting is high level at +4dBu.

9. Place the modified console correct side up. Cut the label block into individual labels as shown dependent on the operating level set. For standard setting cut the label for high level +4dBu. If you have configured the option assemblies for low level operation cut the label to indicate -10dBV. Remove the adhesive backing and stick the labels next to the balanced connectors as shown.



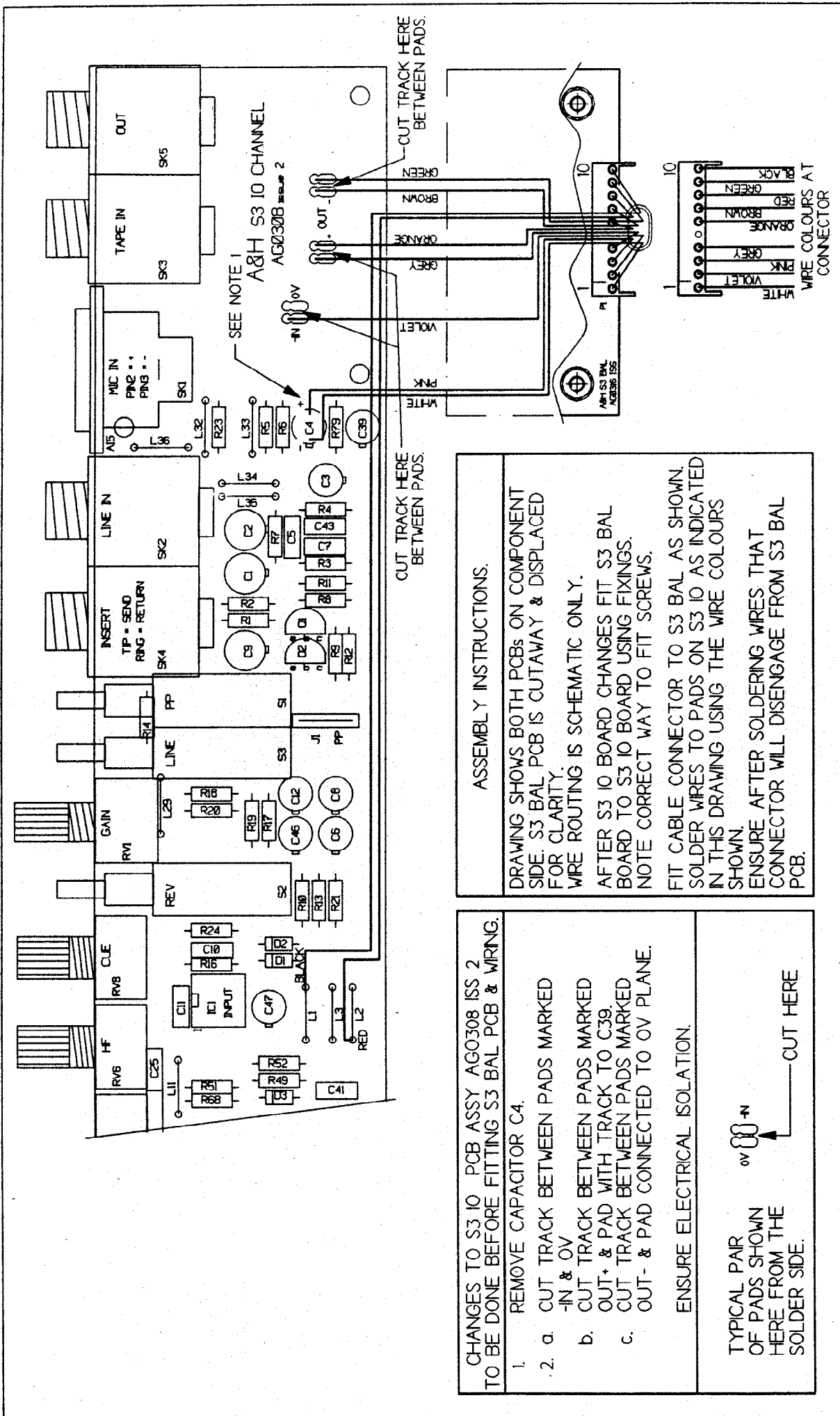
TESTING FOR CORRECT OPERATION

It is recommended that the balanced connections are tested using a dB voltmeter and oscilloscope to test for correct level and phase. With the console group meters set to read '0' using the built-in console oscillator the balanced **GRP/DIR** outputs should provide a +4dBu output. If configured for low level operation they should provide -8dBu (+10dBV). Signal phase should be correct for jack tip = hot (+), ring = cold (-). To test the balancing function you should measure an inphase signal between tip and sleeve (earth), and an out of phase signal between ring and sleeve. Both these signals should be the same level 6dB lower than balanced output i.e.. -2dBu (-14dBu).

The **TAPE INPUTS** should work correctly with +4dBu (-8dBu) signal input.

If suitable test equipment is not available the option should be tested with the intended multitrack recorder. The level alignment should be correct between console and multitrack with the meters reading '0'. The console oscillator should be used to check this alignment.

NOTE: Remember to check that the correct power supply unit is provided with the modified console This applies to 32 channel **GS3V** consoles as explained previously.

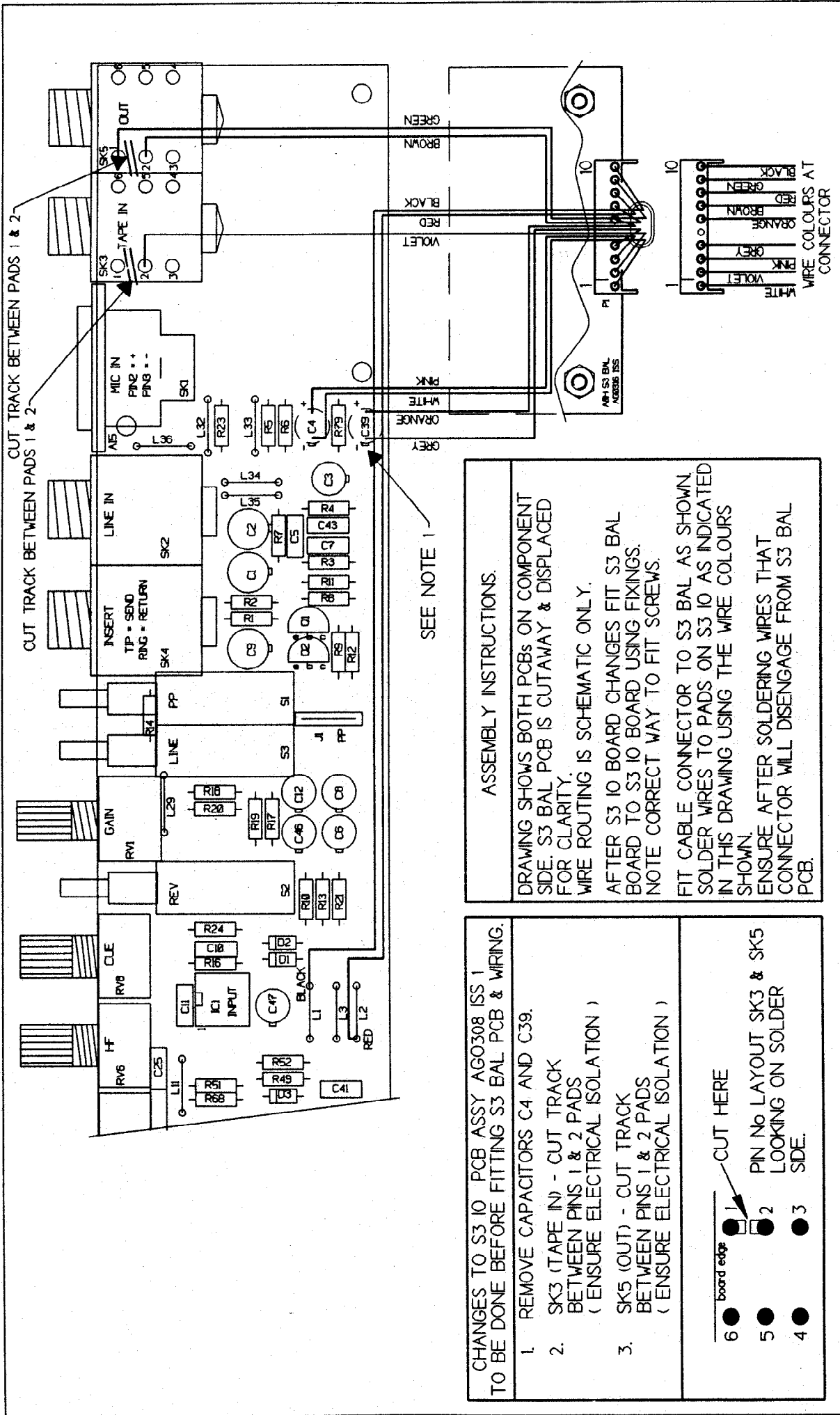


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|---|----------|-------|------|---------------|
| ISS. | REVISION | BY | DATE | NOTES |
| | 1 | ORIGN | DRP | 8-10-93 |
| BALANCED MULTITRACK OPTION | | | | GS3 |
| FITTING INSTRUCTIONS FOR CONSOLES WITH S3 IO AG0308 ISSUE 2 BOARDS. | | | | ALLEN & HEATH |
| DRAWING No D210 Sheet 2 of 3 | | | | ISSUE 1 |

MANUFACTURED IN ENGLAND BY

ALLEN & HEATH

DRAWING No D210 Sheet 2 of 3 ISSUE 1



| | | | | | |
|---|--|----------------|--------|--------------|--|
| ISS. 1 | | REVISION ORIGN | BY DRP | DATE 8-10-93 | NOTES |
| <p>CHANGES TO S3 IO PCB ASSY AG0308 ISS 1 TO BE DONE BEFORE FITTING S3 BAL PCB & WIRING.</p> <ol style="list-style-type: none"> 1. REMOVE CAPACITORS C4 AND C39. 2. SK3 (TAPE IN) - CUT TRACK BETWEEN PINS 1 & 2 PADS (ENSURE ELECTRICAL ISOLATION) 3. SK5 (OUT) - CUT TRACK BETWEEN PINS 1 & 2 PADS (ENSURE ELECTRICAL ISOLATION) | | | | | <p>ASSEMBLY INSTRUCTIONS.</p> <p>DRAWING SHOWS BOTH PCBs ON COMPONENT SIDE. S3 BAL PCB IS CUTAWAY & DISPLACED FOR CLARITY.</p> <p>WIRE ROUTING IS SCHEMATIC ONLY.</p> <p>AFTER S3 IO BOARD CHANGES FIT S3 BAL BOARD TO S3 IO BOARD USING FIXINGS. NOTE CORRECT WAY TO FIT SCREWS.</p> <p>FIT CABLE CONNECTOR TO S3 BAL AS SHOWN. SOLDER WIRES TO PADS ON S3 IO AS INDICATED IN THIS DRAWING USING THE WIRE COLOURS SHOWN.</p> <p>ENSURE AFTER SOLDERING WIRES THAT CONNECTOR WILL DISENGAGE FROM S3 BAL PCB.</p> |
| <p>BALANCED MULTITRACK OPTION</p> <p>FITTING INSTRUCTIONS FOR CONSOLES WITH S3 IO AG0308 ISSUE 1 BOARDS.</p> | | | | | <p>MANUFACTURED IN ENGLAND BY ALLEN & HEATH</p> |
| DRAWING No D210 Sheet 3 of 3 | | | | | ISSUE 1 |
| A4 | | | | | |

THE STANDARD BALANCE OPTION CONVERTS LOW LEVEL (-10dBV) GS3 OPERATION TO HIGH LEVEL (+4dBV) MULTITRACK OPERATION.

IF THIS CONVERSION IS NOT REQUIRED REPLACE R1, R2 & R5 WITH 8K2 RESISTORS, AND REMOVE R7. THIS GIVES 0dB GAIN THROUGH THE OPTION.

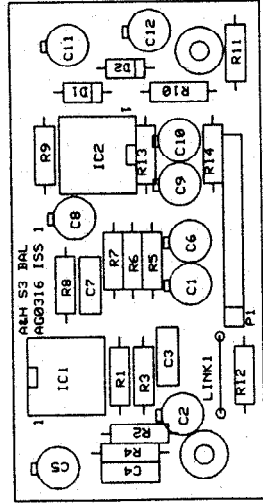
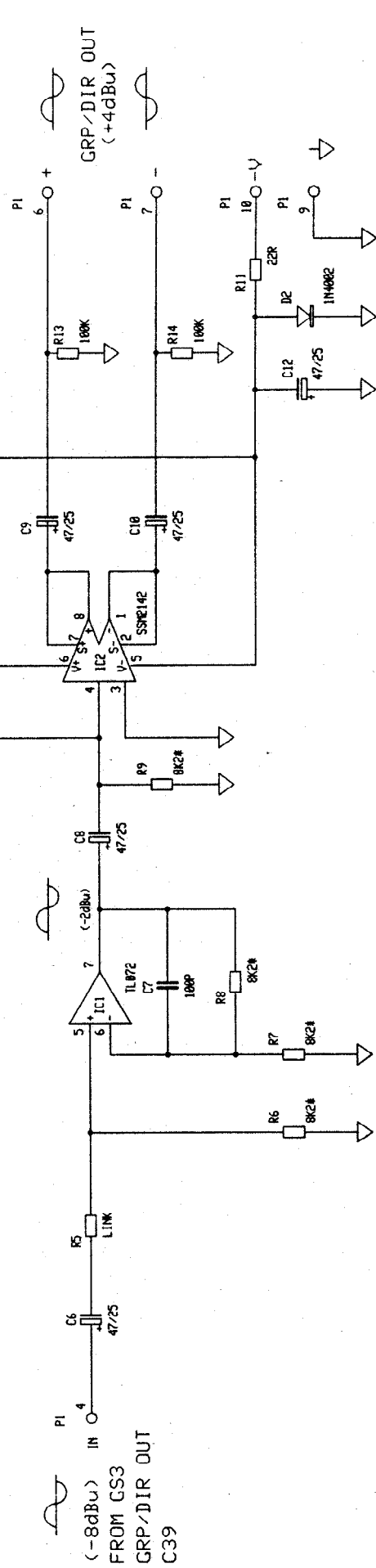
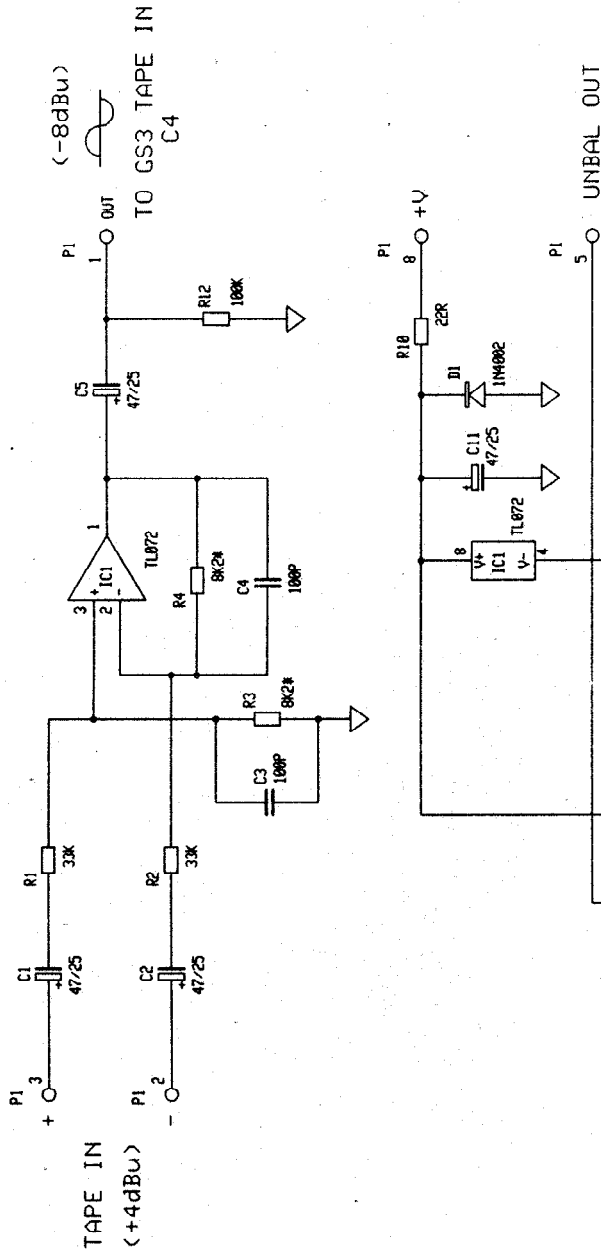


FIG. 3D COMPONENT LAYOUT DRP 15-2-93 ALLEN & HEATH



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| ISS. | REVISION | BY | DATE | NOTES | UNIT TITLE | MANUFACTURED IN ENGLAND BY |
| ISS1 | ORIGIN | DRP | 14-10-93 | <ol style="list-style-type: none"> RESISTORS MARKED # ARE 1% ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE MARKED ELECTROLYTIC CAPACITORS ARE µF/MOLTS | S3 | ALLEN & HEATH |
| | | | | DRAWING TITLE | | DRAWING No. D209 ISSUE 1 |
| | | | | BALANCED MULTITRACK OPTION | | |
| | | | | CIRCUIT DIAGRAM | | |