

# ALLEN & HEATH



## **WARNING – HIGH VOLTAGES**

Power Supply Unit (PSU) work should only be carried out by qualified personnel.

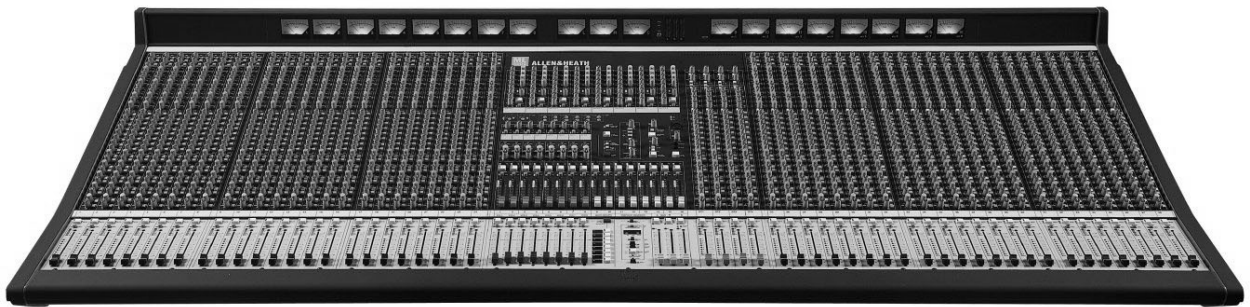
We recommend that you use an approved Allen & Heath service centre for all power supply work.

Please contact your local Allen & Heath distributor for more details.

<http://www.allen-heath.com/>

# **ALLEN&HEATH**

# **ML5000**



**Dual Function Live Sound Console**

# **SERVICE MANUAL**

Publication AP3737

# Introduction

This service manual provides technical information on the Allen & Heath **ML5000** audio console. Included is the technical specification, system block diagram, circuit schematics with board layouts, and a spare parts list. Information on the power supply is available in a separate publication. Only technically qualified service personnel should carry out service work on the console and its power supply.

Whilst we believe the information in this manual 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.


We are able to offer further product support through our world-wide network of approved dealers and service agents. You can also access our Web site on the Internet for information on our product range and further technical support. To help us provide the most efficient service please keep a record of the console serial number, and date and place of purchase to be quoted in any communication regarding this product. The serial number is located on the rear panel.

Check out our home site for information on the company and its pedigree, our full product range and our design philosophy.

[www.allen-heath.com](http://www.allen-heath.com)

## ML5000 Service Manual AP3737 Issue 2

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 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 users authority to operate it.

# ALLEN&HEATH

Manufactured in the United Kingdom by Allen & Heath

Kernick Industrial Estate, Penryn, Cornwall, TR10 9LU, UK

<http://www.allen-heath.com>

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# Important Safety Instructions

**WARNINGS** - Read the following before proceeding :



**ATTENTION: RISQUE DE CHOC ELECTRIQUE – NE PAS OUVRIR**

- Read instructions:** Retain these safety and operating instructions for future reference. Adhere to all warnings printed here and on the console power unit. Follow the operating instructions printed in the user guide and the power unit user guide.
- Do not remove covers:** Operate the power unit with its covers correctly fitted. Refer any service work to competent technical personnel only.
- Power sources:** Connect the power unit to a mains power only of the type described in the User Guide and marked on the rear panel. 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 your service agent for assistance.
- Power cord routing:** 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.



**WARNING: This equipment must be earthed.**

- Water and moisture:** To reduce the risk of fire or electric shock do not expose the power unit or 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.
- Ventilation:** Do not obstruct the ventilation slots or position the console or power unit where the air flow required for ventilation is impeded. If the console is to be operated in a flightcase ensure that it is constructed to allow adequate ventilation.
- Heat and vibration:** Do not locate the power unit in a place subject to excessive heat or direct sunlight as this could be a fire hazard. Locate the console and its power unit away from any equipment which produces heat or causes excessive vibration.
- 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. Refer servicing to qualified technical personnel only.
- 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 power unit 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 mains lead wires are coloured in accordance with the following code:

TERMINAL		WIRE COLOUR	
		European	USA/Canada
L	LIVE	BROWN	BLACK
N	NEUTRAL	BLUE	WHITE
E	EARTH GND	GREEN & YELLOW	GREEN

The wire which is coloured Green and Yellow 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 must be connected to the terminal in the plug which is marked with the letter N.

The wire which is coloured Brown 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.

## General Precautions

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- Damage :** To prevent damage to the controls and cosmetics avoid placing heavy objects on the control surface, scratching the surface with sharp objects, or subjecting the console to rough handling and vibration.
- Environment :** Protect from excessive dirt, dust, heat and vibration when operating and storing. Avoid tobacco ash, smoke, drinks spillage, and exposure to rain and moisture. If the console becomes wet, switch off and remove mains power immediately. Allow to dry out thoroughly before using again.
- Radiation :** To avoid induced noise and interference pickup do not operate the console close to strong sources of electromagnetic radiation such as power supplies, video monitors, lighting cables and dimmers.
- Cleaning :** Avoid the use of chemicals, abrasives or solvents. The control panel is best cleaned with a soft brush and dry lint-free cloth. Stubborn marks can be removed using a cloth dampened with isopropyl alcohol. Do not leave marking tape stuck to the console for long periods of time as the adhesive can degrade and leave a sticky residue. The faders, switches and potentiometers are lubricated for life. The use of electrical lubricants on these parts is not recommended. Refer to the power unit user guide for instructions on cleaning its ventilation filters.
- Transporting :** The console should be transported in the original packing or purpose built foam lined flightcase. Protect the control surface from damage during transit. The console is a large and heavy item. To avoid injury ensure adequate man power and precaution when lifting or moving the console.

# ML5000 Key Features

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The Allen & Heath **ML5000** is a large format VCA equipped dual function live sound console. It can be quickly configured for front-of-house (FOH) or stage monitor mixing. As one console suitable for both applications it is equally well suited to installation, rental and touring. It offers an IO capability and feature set that satisfies the latest trends in live sound engineering, in particular the growing number of inputs and outputs for multi-speaker house and monitor systems, demands of stereo in-ear monitoring, 3 speaker LCR imaging, advanced grouping and automation. The design ensures on-the-road durability, a clear layout for easy walk up and go operation, and no compromise audio performance.

## Inputs and Outputs

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- 3 Standard frame sizes: 32+4, 40+4, 48+4 (mono + stereo channels)
- 32, 40, 48 mono mic/line inputs with inserts and direct outputs
- 4 dual stereo line inputs
- 24 input sidecar to expand to a maximum 96 inputs
- Main Left, Right and Centre outputs with inserts, C configurable as the engineers monitor
- 8 Groups, 16 Auxes: Group/Aux 1-8 and Aux 9-16 with faders and inserts, Aux 1-8 with rotaries
- Matrix 1-8 with inserts and external inputs
- 2-Track monitor input and recording send
- Stereo headphones and local monitors
- Dual mic talkback input
- ClearCom compatible intercom interface

## Groups and Automation

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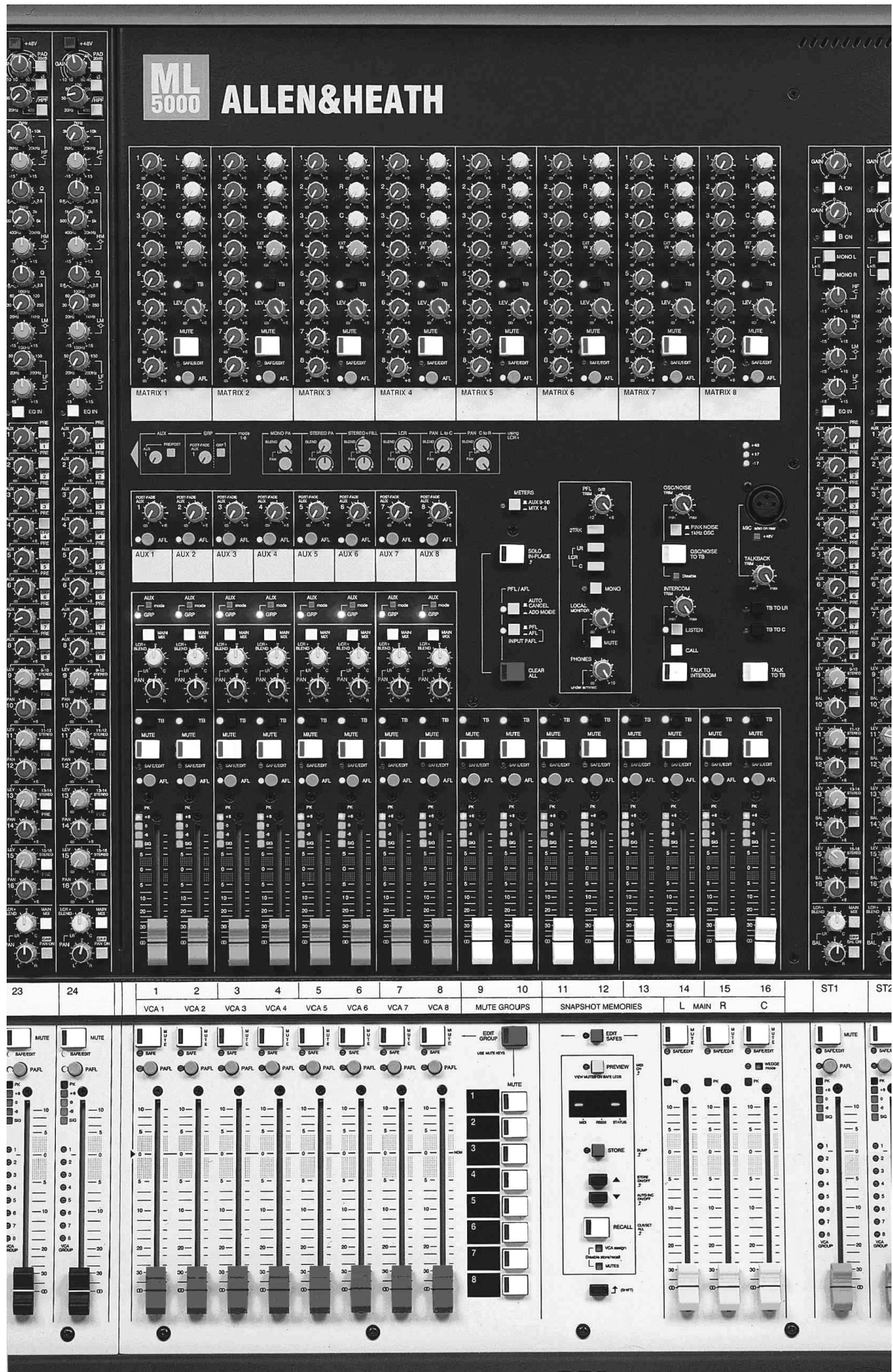
- 8 VCA groups with mutes and PAFL monitoring
- 8 audio groups with LCRplus™ subgrouping
- 8 mute groups
- 128 snapshot memories for mute and/or VCA assignment store, recall and preview
- Solo-in-place with all-clear and toggle-last
- MIDI mute on/off, snapshot recall and dump in/out control
- Channels can be made safe independently from the automation and solo-in-place

## Processing and Control

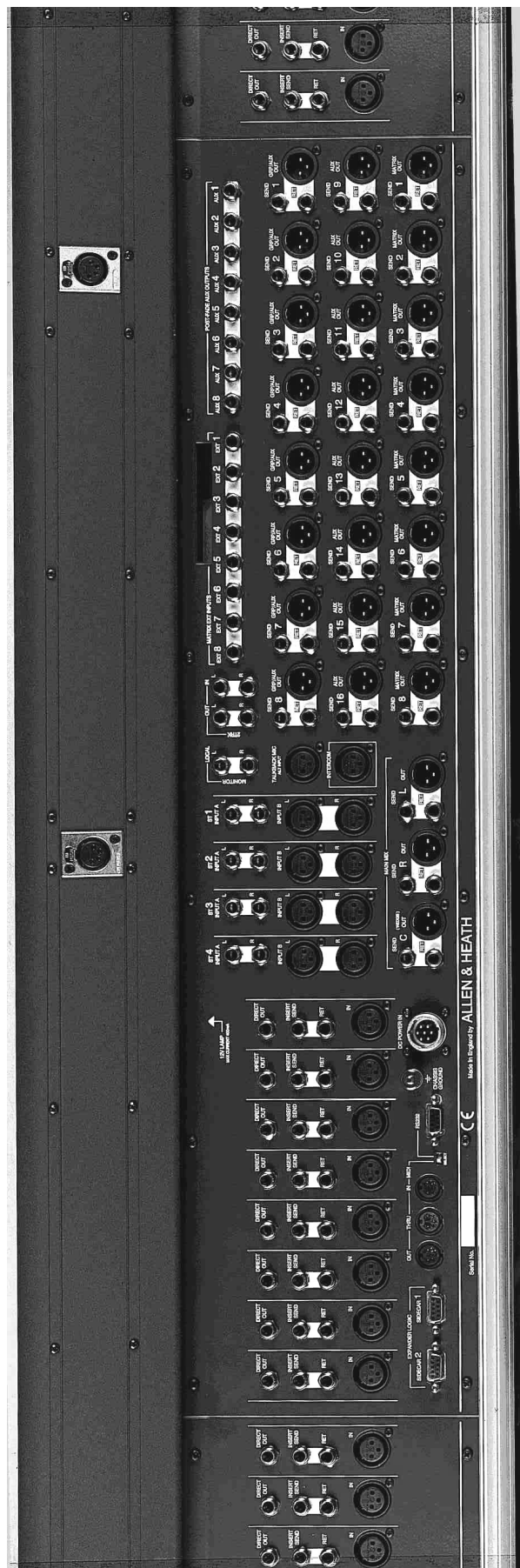
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- 4-Band full sweep mono EQ with fully parametric mids, 4-band fixed frequency stereo EQ
- Sweepable high pass filter
- LCRplus™ 3 speaker imaging system
- Protected mode switching to configure the console for FOH or monitor application
- Intelligent PAFL system with all-clear, PFL/in-place AFL, priority, auto-cancel/add mode...
- Assignable talkback and intercom
- 1kHz tone and pink noise generator for system line-up and testing
- Full console monitoring and extensive metering of inputs, mix busses and outputs

# Front Panel Layout



# Rear Panel Layout



**MONO INPUT and EQ.** The input preamp matches microphone or line level signals to the console. The sweepable high pass filter removes unwanted low frequency sounds below the selected frequency. The channel insert is post filter, pre EQ. A swept frequency 4 band equaliser provides shelving high and low bands with adjustable shelf frequency, and fully parametric high and low mid bands with adjustable centre frequency and Q. The filter and EQ can be independently switched in or out.

**GRP/AUX SENDS.** This section provides controls for the group routing and auxiliary sends. Controls 1-8 function according to the setting of the mode switches in the master section. These configure group routing switches and independent post-fade aux sends for FOH (front-of-house) application, or pre/post switchable sends for stage monitor application. Controls 9-16 can be configured as mono or stereo pre/post aux sends.

**MAIN MIX SENDS.** A single switch routes the channel signal to the main L, R and C outputs. The balance between the three outputs is determined by the LCRplus pan and blend controls. Pan can also be switched in or out of the group routing for stereo or mono groups.

**INPUT FADERS.** Includes the channel fader, mute, signal meter and PAFL monitoring. The 8 VCA group assignments are displayed. VCA and mute group editing and channel safe selection is performed using the mute switch with green safe/edit indicator below.

**STEREO INPUT and EQ.** The input preamp accepts two stereo sources with independent control of each. This allows selection of either or mixing together both sources. A fixed frequency 4 band equaliser provides shelving high and low bands and two bell mid bands. The EQ can be switched in or out.

**GRP/AUX 1-8 MASTERS.** These are the fader masters for channel sends 1-8, configurable using mode switches as fixed level groups or as variable level pre or post-fade auxes. The output can be routed to the main mix through LCRplus controls to create sub groups. Led meters display the pre-fade mix levels.

**AUX 9-16 MASTERS.** These are the fader masters for channel sends 9-16.

**ROTARY AUX MASTERS.** These are the rotary masters for channel post-fade aux sends 1-8. They provide the independent effects sends when the fader masters are configured as groups. They still function when the fader masters are configured as pre/post auxes but would not normally be required.

**MAIN MIX FADERS.** Provides separate master faders and mutes for the main L, R and C outputs. A mode switch configures the C output as the engineers wedge monitor feed for the stage monitor application.

**MATRIX.** This section provides all the controls for the 8 matrix outputs, including the source and master rotaries.

**VCA GROUPS.** These are the VCA group master faders, mutes and PAFL monitor switches. Channels are assigned to the groups using the edit key. The normal fader operating level is marked '0'.

**MUTE GROUPS.** These are the master keys that mute all channels assigned to the group. Channels are assigned using the edit key.

**SNAPSHOT MEMORIES.** Provides the controls to store, recall and preview the 128 onboard memories, and edit channel safes. Mute settings and/or VCA assignments can be disabled from the snapshots.

**HEADPHONES / MONITOR.** Provides source selection and independent control of the headphones and local monitor outputs.

**SOLO-IN-PLACE.** Pressed with the shift key this puts the console into SIP mode ready to solo any channel when its mute key is pressed.

**PAFL CONTROL.** This section controls how the intelligent PAFL system functions and provides the clear all key.

**OSC/NOISE GENERATOR.** Enables and selects a 1kHz tone or pink noise which can be routed to any output for line up or system testing.

**INTERCOM.** The console talkback mic and headphones can be interfaced to a ClearCom compatible intercom system so eliminating the need for a separate intercom headset.

**TALKBACK.** Pressing the talk switch routes the talkback mic to any output with its TB enable switch selected. The mic input is duplicated on the rear panel for plugging in hand held microphones.

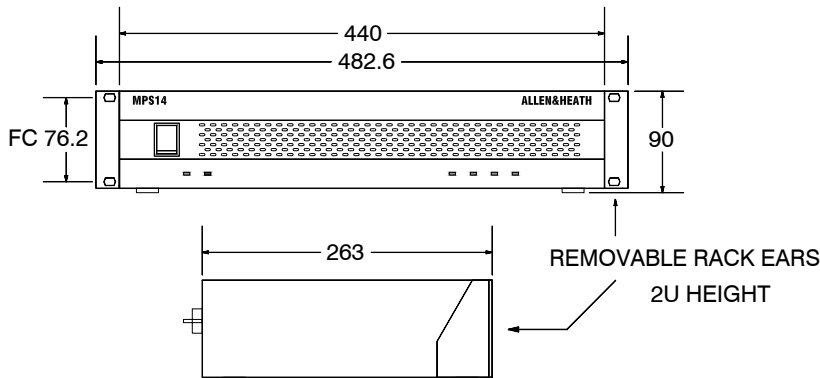
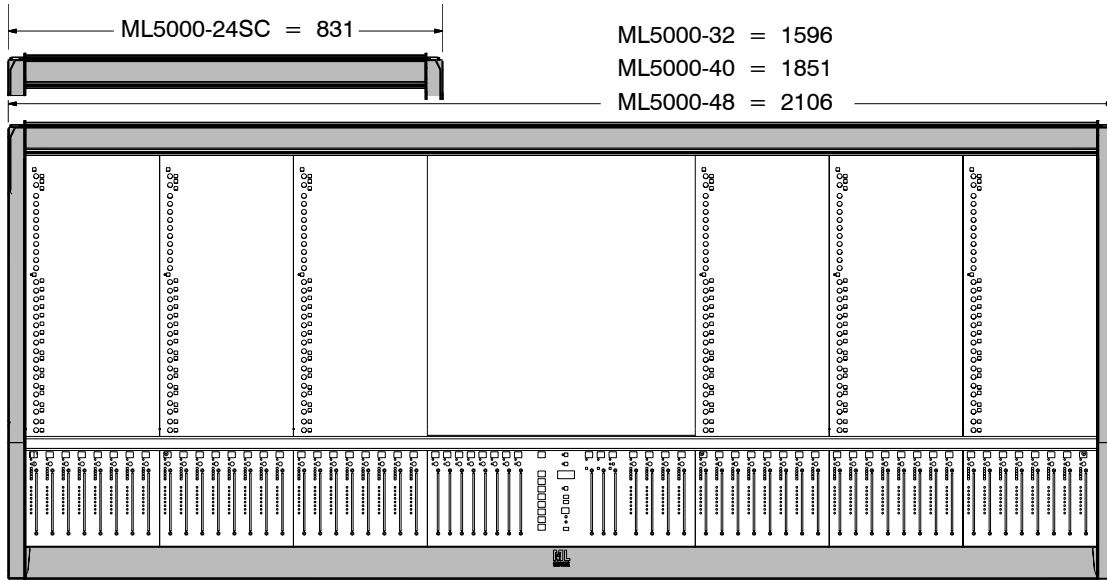
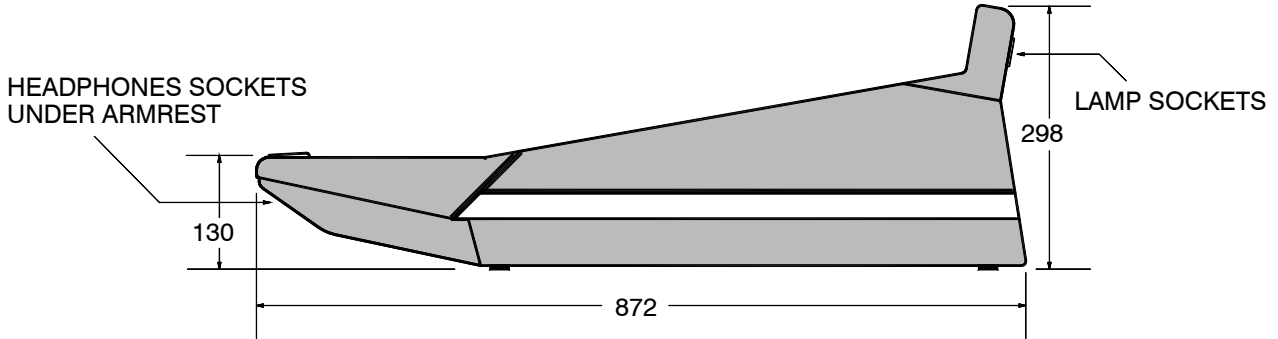
**GRP/AUX 1-8 METERS.** These moving coil VU meters display the grp/aux 1-8 outputs.

**LRC/PAFL METERS.** The main L,R and C outputs are simultaneously displayed on both VU and led bar meters. These switch to display any PFL or AFL when selected. The display is mono or mono + stereo depending on source. The large call lamp lights to warn when the intercom is signalled.

**AUX 9-16 / MTX 1-8 METERS.** These meters display either the aux 9-16 outputs or matrix 1-8 levels according to the setting of the meter select switch near section.

# Installing the Console

Weights	32 Channel	84 kg (185 lbs)
	40 Channel	96 kg (211 lbs)
	48 Channel	110 kg (242 lbs)
	24 Channel sidecar	45 kg (95 lbs)
	MPS14 psu	6 kg (13 lbs)

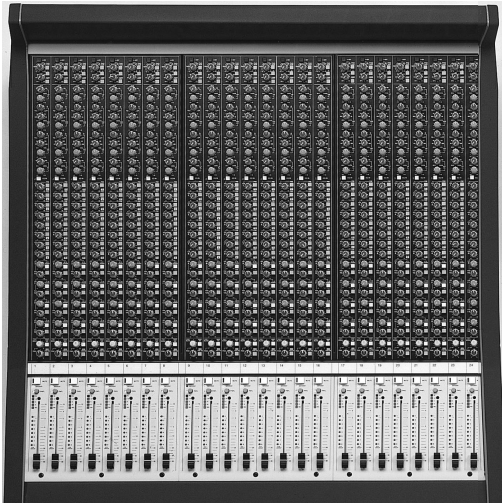


Refer to the power supply user guide for safety and installation instructions. **Heed all warnings printed in the user guide and on the power unit.**

Refer to the sidecar user guide for instructions on connecting the sidecar expander to the console.

**CAUTION:** Ensure adequate ventilation around the power supply unit. Do not operate it where it is subject to excessive heat, for example in direct sunlight or next to power amplifiers. Use forced air cooling such as rack fans if it is operated in a confined or hot space.

# The Expander Sidecar



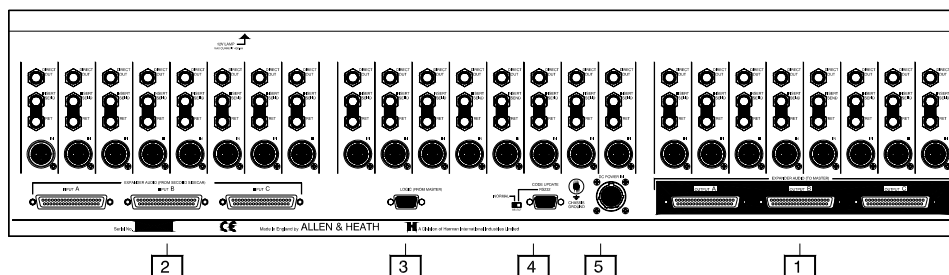
The Allen & Heath **ML5000-24SC Sidecar** is the 24 mono input channel expander for the **ML5000** console. It is free standing and does not need to be mechanically fixed to the main console. Interconnection is by means of multiway cables to link the audio signals and control logic. It is supplied with its own power supply unit independent of the console. The input channel strip is identical to the main console with all functions available. The groups and snapshots are controlled from the main console. Up to two gooseneck lamps (part AL4061) may be plugged into the rear of the meterbridge.

**Note:** This sidecar may be used with the **ML5000** only. It is not suitable for use with other consoles or as a stand alone console. One or two sidecars may be connected allowing a maximum 96 input

channels. Do not connect more than two sidecars.

The following is supplied with each sidecar:

1x <b>MPS14</b> Power Supply Unit with User Guide	MPS14/n
1x Mains cord with moulded plug suitable for your local supply	n = volts
1x DC power cable 2.8 metres long	002-583
3x 37way Audio Cables 2.8 metres long	002-617
1x 9way Logic Cable 2.8 metres long	AL4155



## Connecting the Sidecar to the Console

**Diagram 1** shows the cable routing for connecting the sidecars to the **ML5000**. Refer to **Diagram 2** for connecting one sidecar. Refer to **Diagram 3** for connecting two sidecars.

Connect the three audio OUTPUT connectors **1** to the main console EXPANDER INPUT using the three 37way 1 to 1 shielded cables provided. We recommend that you label the cables A, B and C to avoid them being swapped if replugged. If you are connecting a second sidecar plug its OUTPUT into the first sidecar INPUT connectors **2**. Plug the LOGIC connector **3** into the main console LOGIC connector 1 for one sidecar, or 1 and 2 for two sidecars. Plug the power supply DC cable into connector **5**.

**Note:** To maintain correct channel assignment do not reverse the interconnecting cables. Make sure the cable plug locking screws are correctly tightened.

## Turning the Console and Sidecars On and Off

Make sure the DC power cables and audio and logic interconnecting cables are correctly plugged in and locked. Turn all power supplies on or off together. Alternatively, turn the sidecar supplies on first followed by the main console, and turn the console off first followed by the sidecars. Do not turn off any supply during normal console operation.

**Note:** For normal console operation make sure the rear panel RS232 switch **4** is set to its NORMAL position. It will not function correctly if left in its RS232 position.



Diagram 1

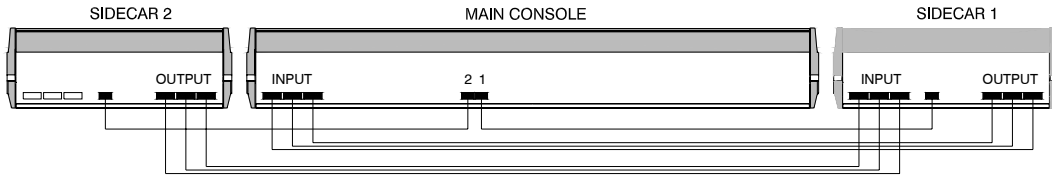


Diagram 2

### CONNECTING ONE SIDECAR

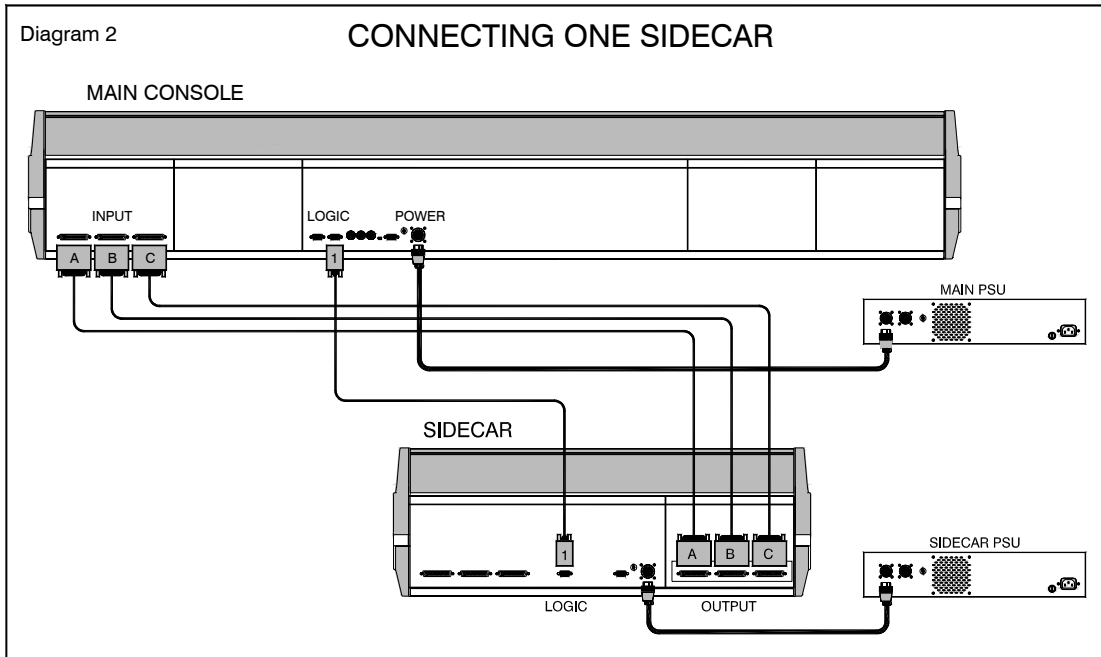
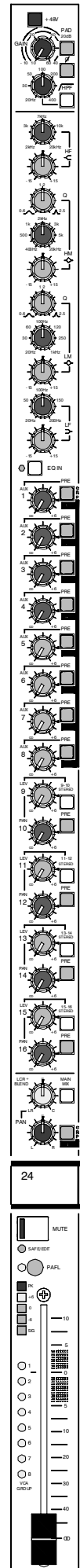
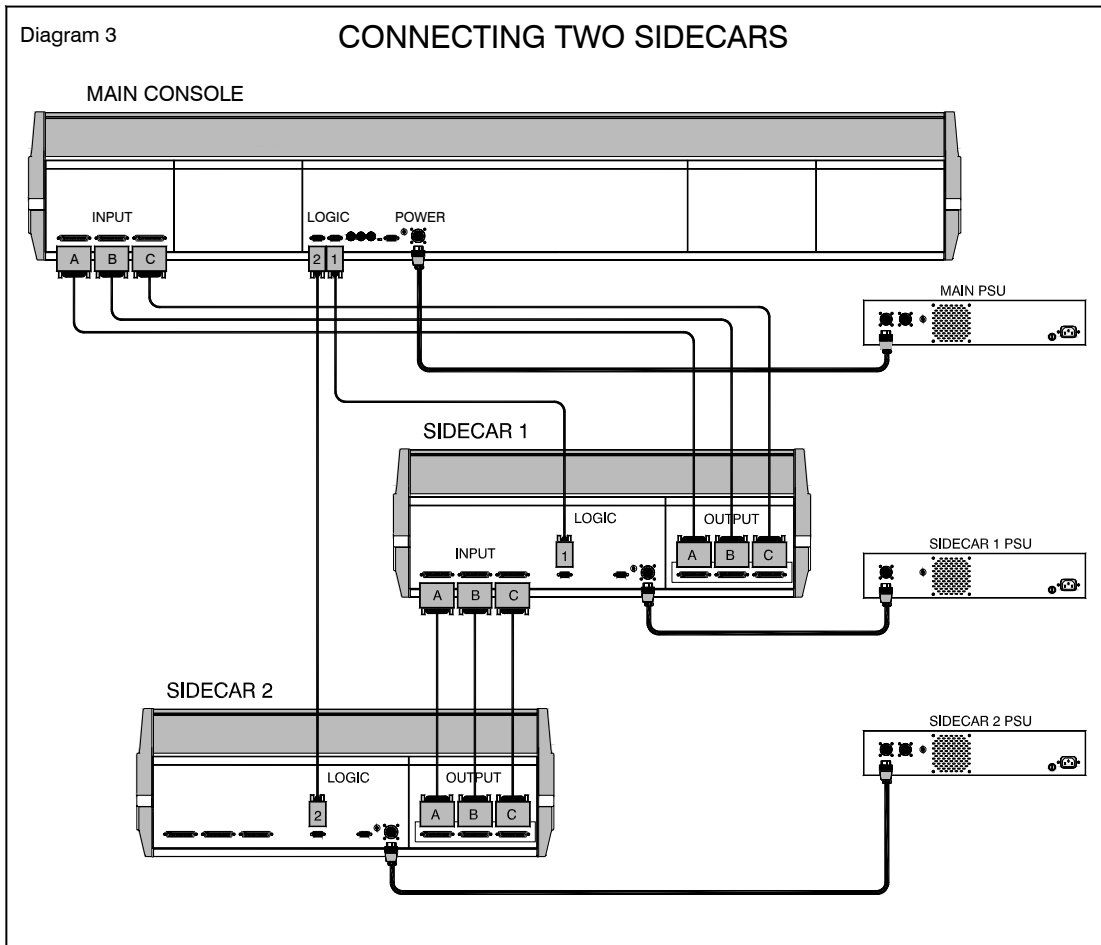


Diagram 3

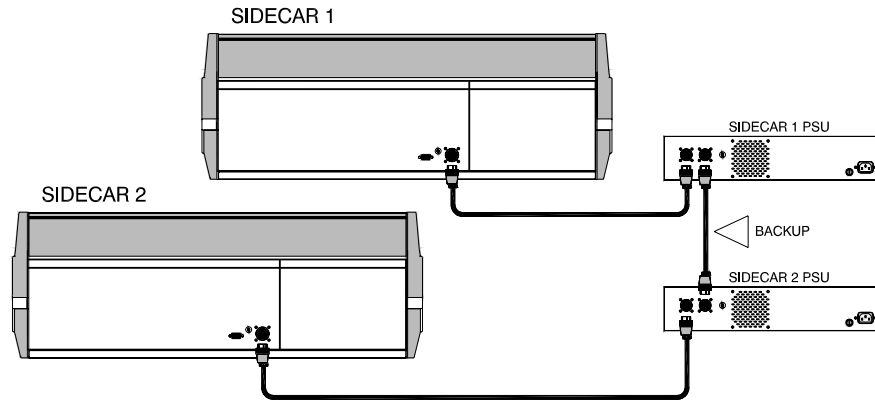
### CONNECTING TWO SIDECARS



## Combining Sidecar Power Supplies for Backup

If you are connecting two sidecars then you can link the power supplies together for redundant supply backup. One **MPS14** supply is capable of running both sidecars together should the other fail. You need to order the short 0.7 meter DC power cable (part 002-584) for linking.

**Note:** Do not link the main console power supply to the sidecar supply in this way. One supply is not capable of running both the main console and its sidecar should the other fail. You should order a spare power supply with your console in this case. Make sure the power supplies are positioned next to each other and using the same mains distribution.



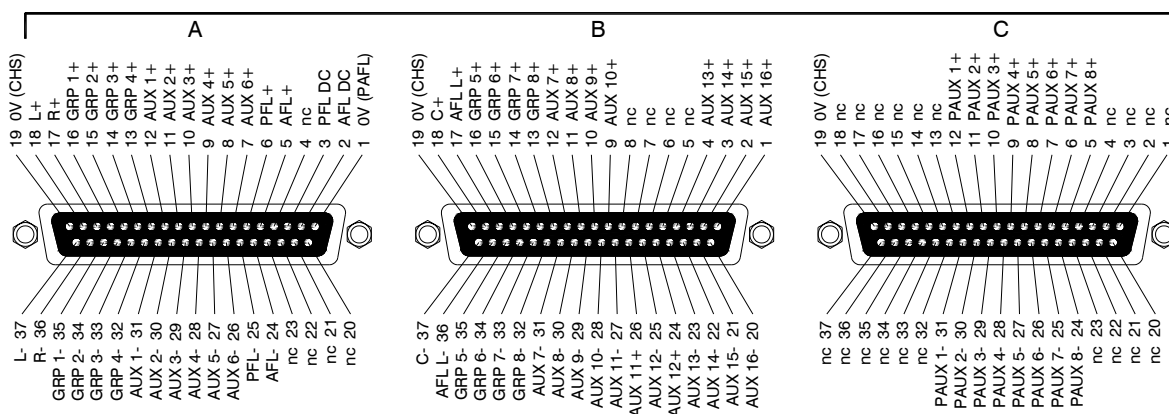
## RS232 Code Update

A rear panel RS232 port is provided. This is used for loading new operating software into the sidecar from a PC. It is not used for any other function. Check our Web site [www.allen-heath.com](http://www.allen-heath.com) for details on the latest version of **ML5000** operating software and instructions on loading it into the console.

**Note:** The sidecar settings are archived using a MIDI or RS232 dump from the main console. There is no need to archive the sidecar settings separately.

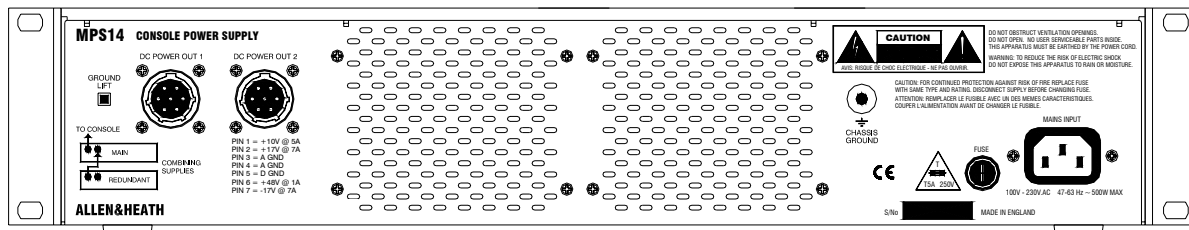
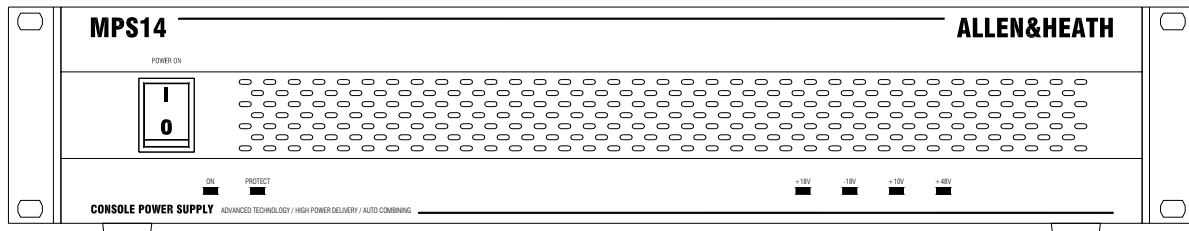
## Sidecar Audio Connections

The following information is provided for reference only. It is not necessary to wire special cables to connect the sidecar to the console. Standard 1 to 1 wired 37way cables are provided. The audio signals are balanced and operate at a nominal  $-2\text{dBu}$  line level.



# The MPS14 Power Supply

The slimline MPS14 power supply uses linear post-regulated switch mode technology to generate the DC voltages required by the console. It will operate from a wide range of ac mains input voltages. Full protection and thermally controlled fan cooling ensures the power unit will operate consistently. The MPS14 also has a built in combiner for connection to a second supply for backup.



## Power Supply Installation

### Free standing

The MPS14 can be operated as a free-standing unit without requiring any special cooling arrangement, but should not be accidentally or deliberately covered in any way. Always stand the unit on a firm flat surface well away from any soft furnishings or carpet.

### Rack mounting

The MPS14 is designed as a 19 inch rack mount unit and will occupy 2U (3.5 inches) of rack space.

An important consideration when rack-mounting the unit is the need for natural convection of air flow over the whole unit.

Good ventilation below the unit, in the floor or back of the rack, will ensure a path for continuous air flow.

Other equipment in the rack which is known not to produce a significant amount of heat should be mounted below the unit. Equipment which also relies on good airflow within the rack (i.e. most power amplifiers and other power supplies) should be given due consideration and some space should be provided between such units and between the MPS14 unit. Forced convection, by means of a fan-tray, may be desirable in this situation.

### Location

As with any power supply that contains switch mode technology, it is preferable to provide a degree of physical isolation of the unit from other equipment, particularly that which carries low level audio signals, to avoid any possible interference pick-up. For this reason the unit is provided with a long (2.9m) output cable to enable it to be positioned away from the mixing console. For the same reason, when rack-mounting it is preferable to avoid locating the unit adjacent to signal processing equipment.

### Earthing

Finally, some consideration should be given to the earthing arrangement of the system, at the centre of which is the console and the MPS14. The console chassis is earthed, to the mains earth, via the power supply. When rack-mounting the MPS14 care should be taken to avoid any possible "ground loops" in the system which would introduce audible hum or buzz to otherwise clean audio signals. Ground loops may occur where signal processing equipment patched to the console, has its signal earth connected to the equipment chassis. A ground loop is formed if the chassis of the signal processing equipment and the MPS14 chassis are in electrical contact through the fixing rails they share in the rack. The MPS14 has audio 0V and mains earth connected internally. If a ground loop is formed operation of the ground lift switch on the rear panel of the MPS14 may improve the situation.

# MPS14 Technical specifications

Mains Input Voltage Range 100 - 240 ± 10% VAC @ 47-63 Hz auto-sensing

Power consumption (max.) 500W

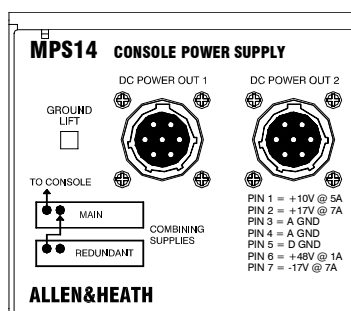
Mains Fuse: 100 - 240 V~ T 5.0A/250V

Internal Fuses:

PCB Ident	Fuse type
F1 (+12V)	T 6.3A 250V 20mm
F2 (+48V)	T 2A 250V 20mm
F18 (aux psu)	T 500mA 250V 20mm

DC Outputs

DC Voltage Rail	Output Current
+17 VOLTS	7A Max.
-17 VOLTS	7A Max.
+12 VOLTS	5A Max.
+48 VOLTS	500mA Max.



DC Output Socket Pin Connections

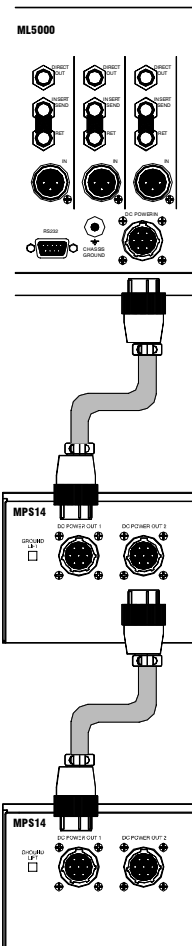
Pin No:	Connection
1	+12 Volts
2	+17 Volts
3	A GND
4	A GND
5	D GND
6	+48 Volts
7	-17 Volts

Overall Dimensions

Front Panel:	482mm x 88mm	19 inch 2U
Width (excluding rack ears):	440mm	17.30 inches
Height including feet:	90mm	3.5 inches
Depth:	260mm	10.25 inches
Weight:	6Kg	13 pounds

Cable Assemblies

Assembly	Description	A&H Part no:
DC cable	2.9m MPS14 to ML5000 console cable assembly	002-583
DC LINK cable	0.5m MPS14 to MPS14 PSU "LINKING" cable assembly	002-584



# ML5000 Technical Specifications

0dBu = 0.775 Vrms, +4dBu = 1.23 Vrms

## Operating Levels

Channels ..... 0dBu Headroom +21dB  
 Mix ..... -2dBu Headroom +23dB

## Frequency Response Referred to 1kHz at +4dBu

Mic to main output (+40dB) ..... 20Hz to 30kHz +0/-0.5dB  
 Line to main output (0dB) ..... 20Hz to 30kHz +0/-0.5dB

## Distortion @1kHz +14dBu

THD+noise ..... < 0.01%

## CMRR Common mode rejection @1kHz

Mic (+40dB) ..... > 80dB  
 Mic + Pad (0dB) ..... > 50dB

## Crosstalk Referred to driven channel @1kHz

Channel to channel ..... > -100dB  
 Mute shutoff ..... > -85dB  
 Fader shutoff ..... > -90dB

## Noise Performance Measured rms 22Hz to 22kHz unweighted

Mic EIN with 150 ohm source ..... -128dB  
 Residual output noise ..... < -94dBu (-98dB SN)  
 Mix noise, nothing routed ..... < -84dBu (-88dB SN)  
 Mix noise, 24 channels routed ..... < -80dBu (-84dB SN)

## Metering

Reading 0 ..... +4dBu at XLR outputs  
 LED meters ..... Peak reading, 3 colours  
 VU meters ..... Ave reading, illuminated moving coil  
 Peak indicators ..... 5dB before clip, multi-point sensing  
 Input meters ..... 5 bar LED (signal, -6, 0, +6, peak)  
 Group mix meters ..... 5 bar LED (signal, -6, 0, +6, peak)  
 Group/Mtx meters ..... VU  
 L,R,C meters ..... VU and 16 bar LED

## Lamp Connectors x4

Connector ..... XLR-F 4pin  
 Rating ..... 12V 400mA max

## Channel Filters

Slope ..... 12dB/oct high pass  
 Frequency ..... 20Hz to 400Hz  
 variable

## Mono Equaliser

HF ..... +/-15dB, 2kHz to 20kHz shelf  
 HM ..... +/-15dB, 500Hz to 15kHz bell, Q = 0.6 to 2.5  
 LM ..... +/-15dB, 35Hz to 1kHz bell, Q = 0.6 to 2.5  
 LF ..... +/-15dB, 20Hz to 200Hz shelf

## Stereo Equaliser

HF ..... +/-15dB, 12kHz shelf  
 HM ..... +/-15dB, 2.5kHz bell  
 LM ..... +/-15dB, 250Hz bell  
 LF ..... +/-15dB, 60Hz shelf

## Power Supply Model MPS14

Type ..... External 2U rack or floor mount  
 Mains input ..... 100-230V 50/60Hz universal input  
 Power consumption ..... 500W  
 Full protection and fan cooling

## Dimensions

	Width	Depth	Height
32 Channel	1596 (62.8")	... 872 (34.3")	.....298 (11.7")
40 Channel	1851 (72.9)	..... 872	.....298
48 Channel	2106 (82.9")	... 872	.....298
Sidecar	831 (32.7")	..... 872	.....298
MPS14 psu	483 (19")	..... 260 (10.2")	.....

## Weights

32 Channel	84 kg (185 lbs)
40 Channel	96 kg (211 lbs)
48 Channel	110 kg (242 lbs)
24 Sidecar	45 kg (99 lbs)
MPS14 psu	6 kg (13 lbs)

## INPUTS:

Mic (Pad out) ..... XLR ..... balanced, pin2+ ..... >20k ohm ..... variable -60 to -10dBu ..... Max +11dBu  
 Mic (Pad in) ..... >20k ohm ..... variable -40 to +10dBu ..... Max +31dBu  
 Stereo A ..... TRS jack ..... balanced, tip+ ..... >20k ohm ..... variable -18 to +6dBu ..... Max +27dBu  
 Stereo B ..... XLR ..... balanced, pin2+ ..... >20k ohm ..... variable -18 to +6dBu ..... Max +27dBu  
 2-Track ..... TRS jack ..... balanced, tip+ ..... >20k ohm ..... +4dBu ..... Max +25dBu  
 Matrix Ext in ..... TRS jack ..... balanced, tip+ ..... >20k ohm ..... +4dBu ..... Max +25dBu

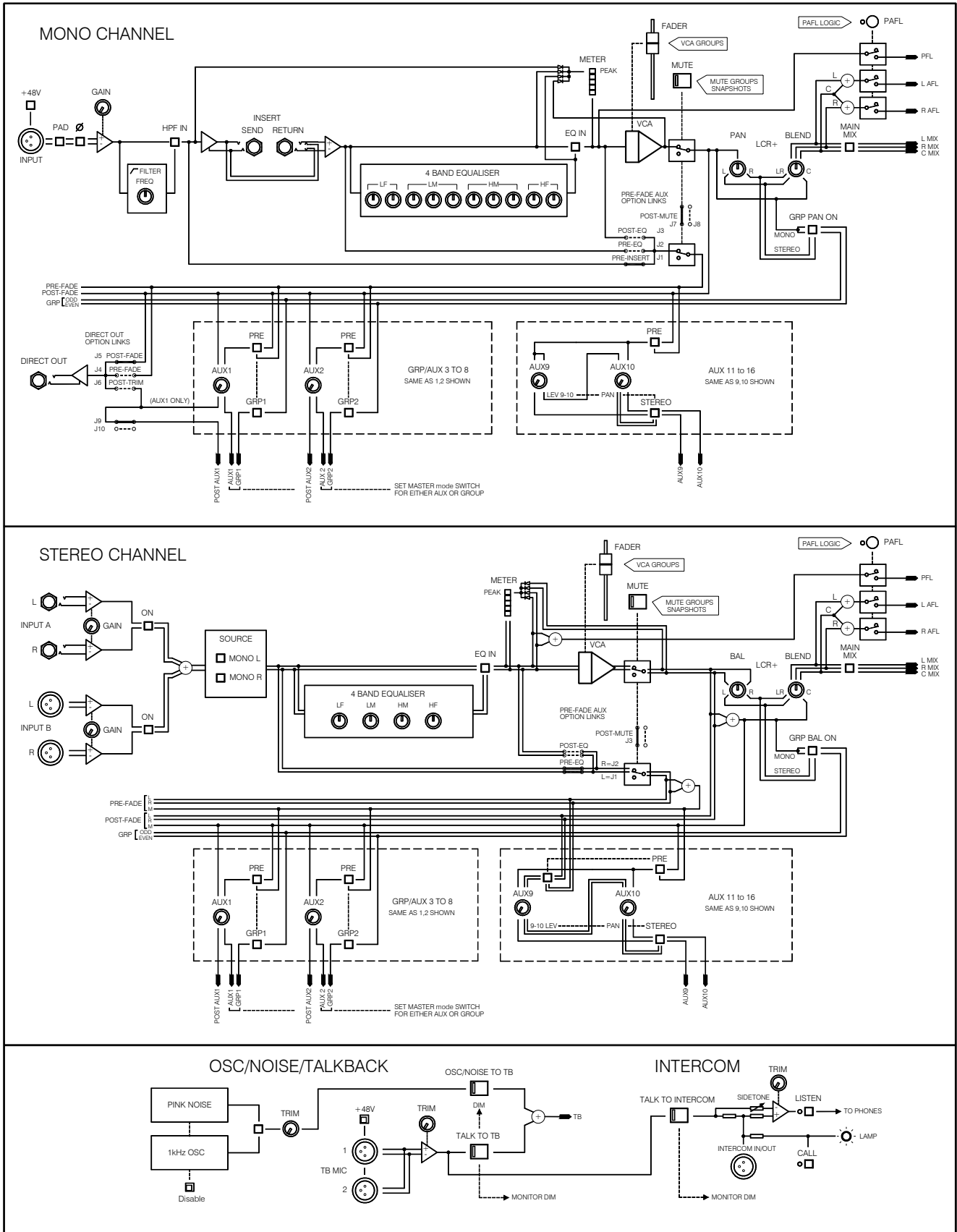
## INSERTS:

Input send ..... TRS jack ..... ground comp, tip+ ..... <50 ohm ..... 0dBu ..... Max +21dBu  
 Input return ..... TRS jack ..... balanced, tip+ ..... >20k ohm ..... 0dBu ..... Max +21dBu  
 Output send ..... TRS jack ..... ground comp, tip+ ..... <50 ohm ..... -2dBu ..... Max +21dBu  
 Output return ..... TRS jack ..... balanced, tip+ ..... >20k ohm ..... -2dBu ..... Max +21dBu

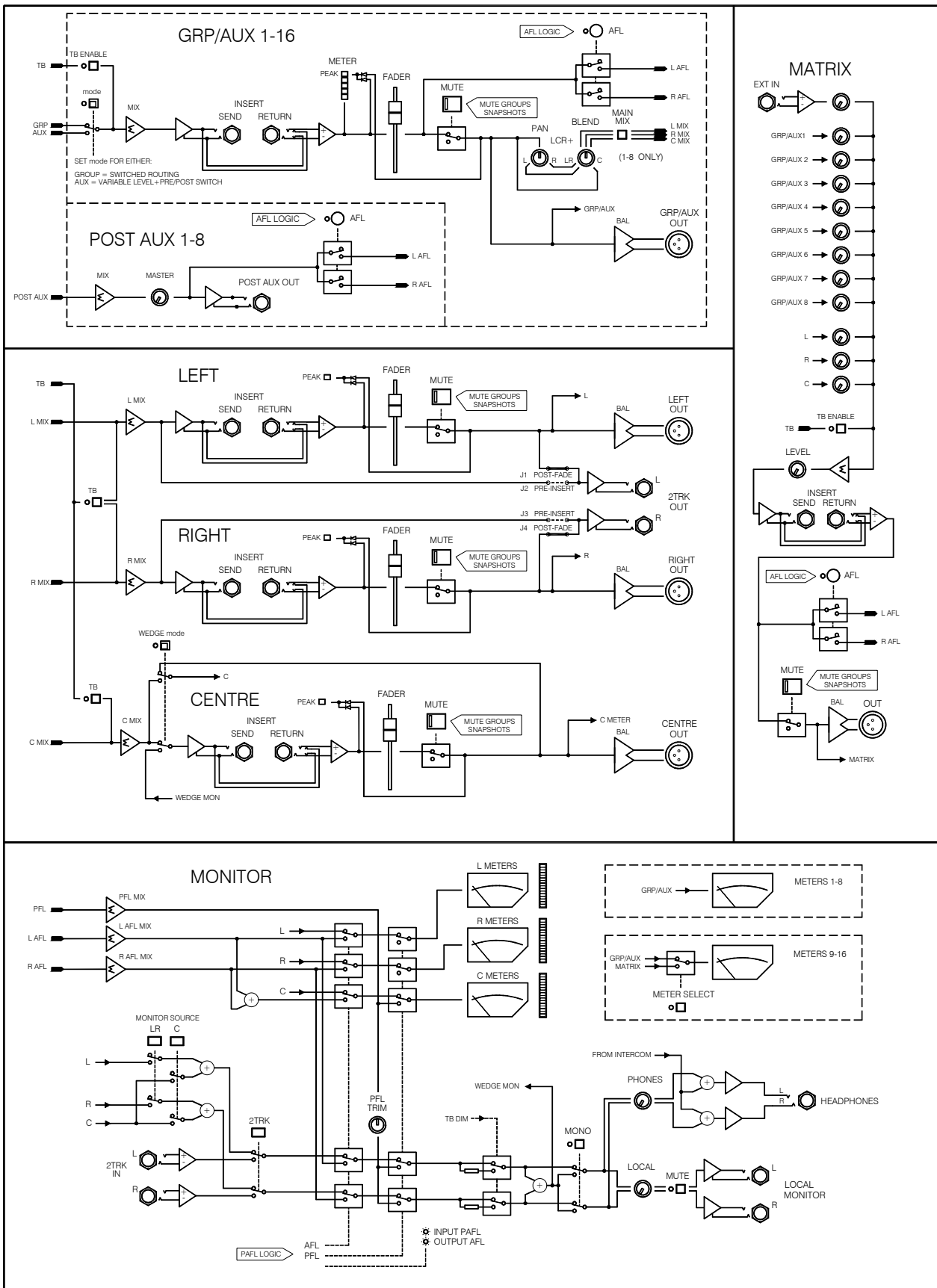
## OUTPUTS:

L,R,C ..... XLR ..... balanced, pin2+ ..... <75 ohm ..... +4dBu ..... Max +26dBu  
 Grp/Aux 1-16 ..... XLR ..... balanced, pin2+ ..... <75 ohm ..... +4dBu ..... Max +26dBu  
 Matrix 1-8 ..... XLR ..... balanced, pin2+ ..... <75 ohm ..... +4dBu ..... Max +26dBu  
 Post Aux 1-8 ..... TRS jack ..... ground comp, tip+ ..... <50 ohm ..... -2dBu ..... Max +21dBu  
 Direct out ..... TRS jack ..... ground comp, tip+ ..... <50 ohm ..... 0dBu ..... Max +21dBu  
 2-Track ..... TRS jack ..... ground comp, tip+ ..... <50 ohm ..... +4dBu ..... Max +21dBu  
 Local Monitor ..... TRS jack ..... ground comp, tip+ ..... <50 ohm ..... 0dBu ..... Max +21dBu  
 Headphones ..... TRS jack ..... tip left, ring right ..... for stereo headphones >30 ohms

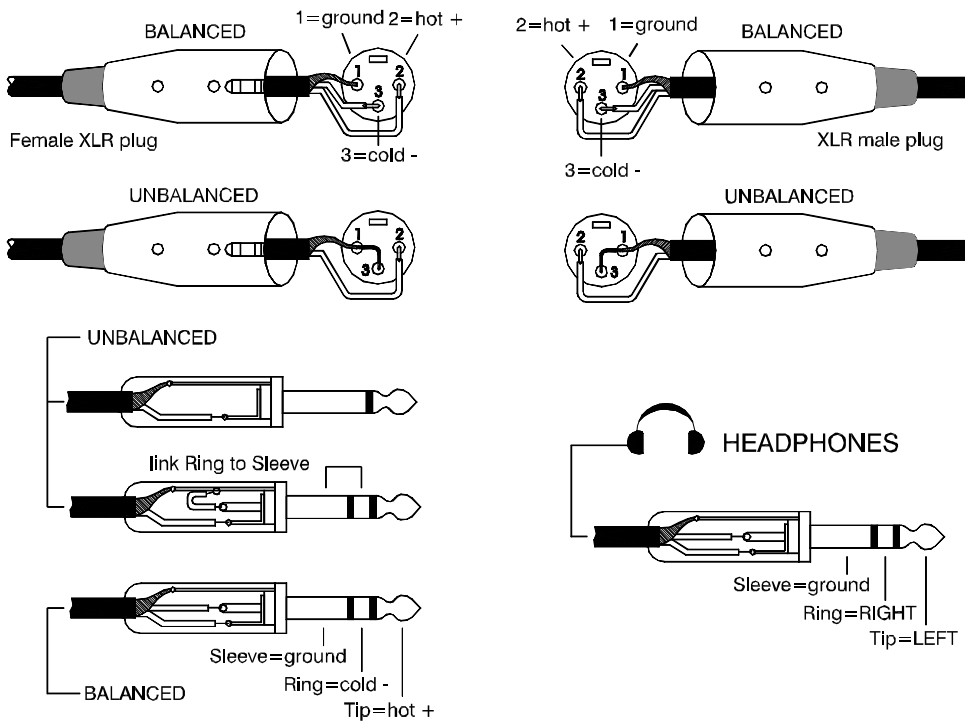
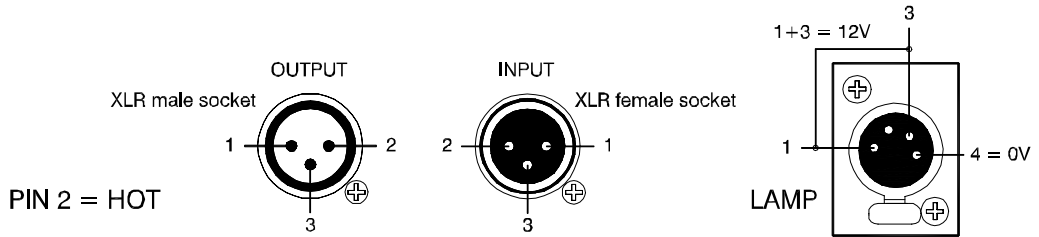
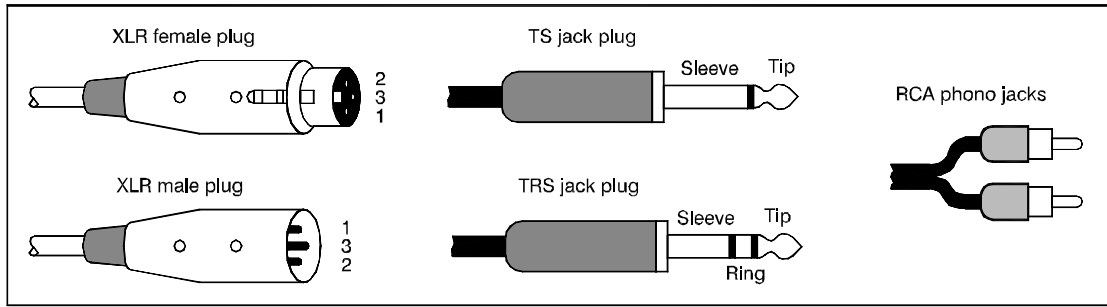
# System Block Diagram (1 of 2)



# System Block Diagram (2 of 2)

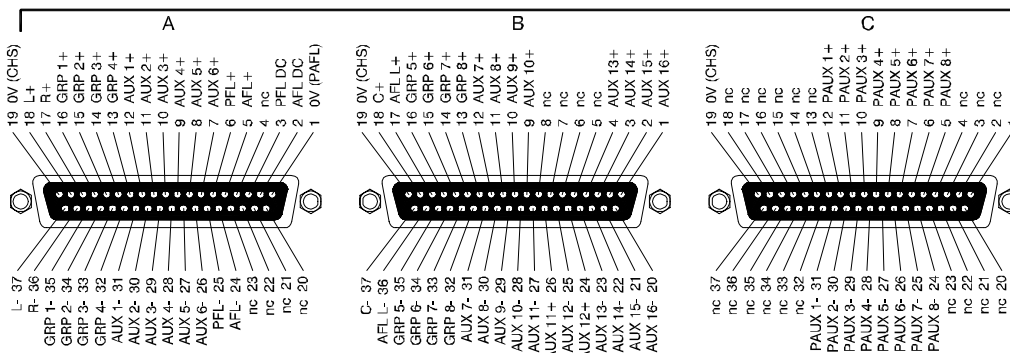


# Connector Types and Wiring



## EXPANDER INPUT

## SYS-LINK II





# Gain Structure (Reprinted from User Guide)

How the levels between the different signal stages are set up is referred to as the gain structure. For best performance it is important that the connected source signals are matched to the 'normal operating level' of the console. Similarly the levels of the connected amplifiers and destination equipment should be correctly matched to the console outputs. If set too high then the signal peaks will be clipped resulting in distortion, and if set too low then the signal-to-noise performance will be degraded resulting in excessive background hiss and noise.

**Using the Meters.** The **ML5000** provides metering at all important stages through the signal chain. For best results operate the console with the LED bar meters averaging around '0' allowing the loudest moments to reach '+6'. Reduce the gain if the red peak LEDs start to flash. Note that the peak leds light 5dB before actual clipping to warn that you are nearing distortion and should reduce gain. The LED bar meters have a peak response with fast attack and slow release so that fast musical transients are accurately displayed. The VU meters have a slower attack so that the average levels are better displayed. Both types of metering are useful in live sound mixing.

**Matching a Source to the Console.** Start by turning down the channel fader and send levels to prevent unexpected loud volumes reaching the main speakers and monitors. Adjust the GAIN control for an average '0' reading on the channel meter. Press PAFL (in PFL mode) to listen to the signal using headphones, local or wedge monitor, and to view its level on the main LED and VU meters. Once the gain is correctly set you can raise the levels to bring the channel into the mix. Note that you may need to adjust the gain if you make significant changes to the EQ. Make sure that any equipment inserted into the channel is set to operate around 0dBu line level. It is best to first set the gain with inserted signal processors such as compressors switched to bypass.

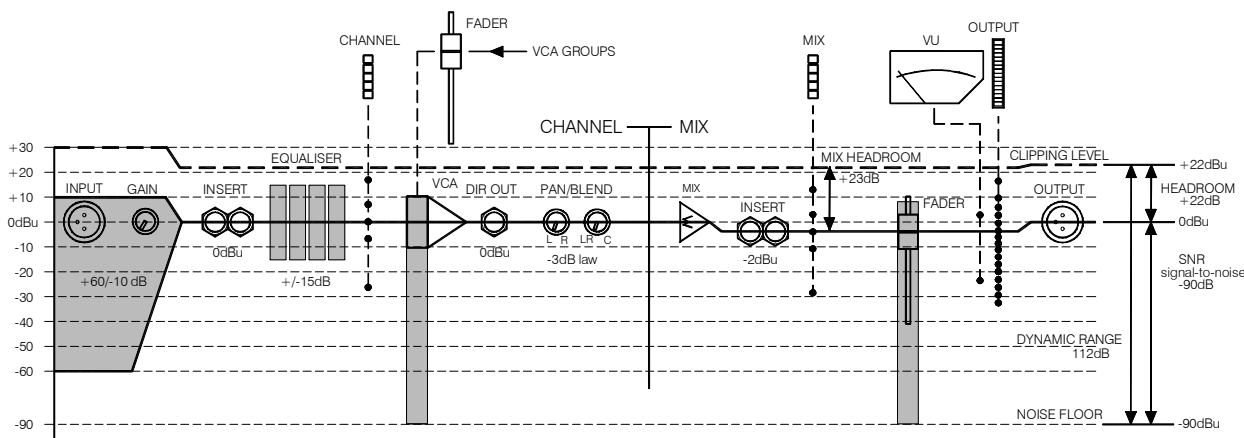
## Matching the Console to Destination Equipment.

The console produces a standard XLR output level of 0dBu for a meter reading of '0' and +22dBu maximum to allow plenty of headroom for driving equipment hotter. If you are connecting directly to a sensitive power amplifier it is advisable to turn down its input trim control if the normal console level is too high. Simply turning down the console output faders degrades the output stage noise performance and reduces the resolution of the fader movement. The output faders are best operated around '-10' to '0' for loudest average volume required. This allows plenty of additional headroom if you need it. If you are connecting to crossovers or speaker managers then set these for normal 0dBu operating level and use their level trimmers to correctly match to the amplifiers.

**Terminology.** The **normal operating level** is the optimum signal level for best console performance, indicated by '0' meter readings. The channels operate at 0dBu and the mix stages at -2dBu for extended headroom. **Headroom** is the extra level available above normal to allow for loud peaks before the signal becomes **clipped** resulting in audible distortion. The **signal-to-noise ratio (SNR)** is the difference measured in dB between normal level and residual noise floor (hiss) produced by the console electronics. The **dynamic range** is headroom + SNR representing the maximum signal range possible from quietest to loudest.

**Using the VCA Groups.** Assigning a channel to one or more VCA groups lets those group faders control the level of its VCA element. Each fader provides up to +10dB boost. Note that the channel VCA allows a maximum combined fader boost of +10dB. Any more is simply ignored. It is best to operate the VCA group faders around their nominal '0' position. You can also use a VCA group to reduce the overall level of a hot mix without having to adjust all the channel faders.

**Final word...** A little care with setting gain structure throughout the signal chain will give you the very best performance and most manageable control of the mix.

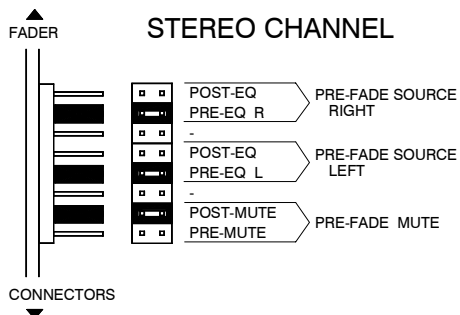
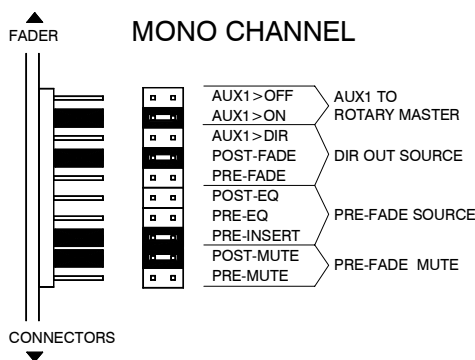


## Channel Jumper Options

Several link options are available to satisfy user preferences. These require removal of the console base panels and replugging of 2way jumpers on the circuit boards. It is not necessary to remove assemblies from the console. To avoid damage to the internal assemblies this work should be carried out by competent technical personnel.

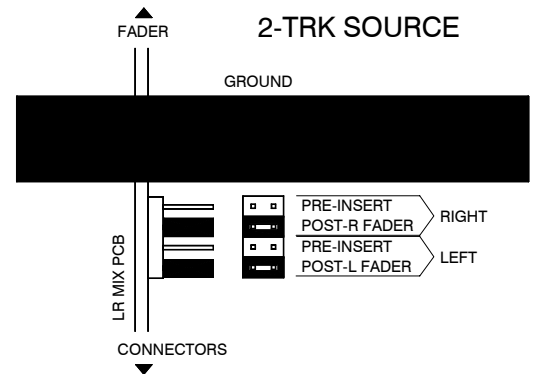
**Pre-fade Source.** The source for the pre-fade aux sends may be changed by repositioning jumper links on each mono and stereo channel. The default factory setting is pre-insert, pre-EQ, post-mute. This is usually preferred when mixing monitors from front-of-house. Select the source as pre-insert, pre-EQ, or post-EQ by setting one jumper. Select pre or post mute by setting another. Set pairs of links on the stereo channels to affect left and right signals.

**Direct Output Source.** The default factory setting is post-fade. This can be changed to pre-fade. Pre-fade follows the source as described above. An additional option sources the output from the AUX1 send control. This provides a post-fade direct output with level trim. If preferred, the channel feed to the AUX1 rotary master can be disabled so that adjusting the direct output level does not feed the mix. Note that this does not affect the AUX1 send to the fader master when aux mode is selected. Select the source as pre-fade, post-fade, or post-fade with AUX1 trim by setting its jumper. Set another jumper to turn the AUX1 feed to the rotary master on or off as required.



## 2-TRACK Jumper Options

The 2-track output is sourced from the main LR mix. The factory default setting is post master LR faders. If you want to source pre-insert, pre-fader then replug the internal jumper links on the LR MIX circuit board as shown below. For stereo recording from a three channel LCR mix, or by creating a new balance from the groups, use the MATRIX outputs instead.



## MIDI Mutes

HEX	MUTE
00	GRP/AUX 1
01	GRP/AUX 2
02	GRP/AUX 3
03	GRP/AUX 4
04	GRP/AUX 5
05	GRP/AUX 6
06	GRP/AUX 7
07	GRP/AUX 8
08	AUX 9
09	AUX 10
0A	AUX 11
0B	AUX 12
0C	AUX 13
0D	AUX 14
0E	AUX 15
0F	AUX 16
10	MATRIX 1
11	MATRIX 2
12	MATRIX 3
13	MATRIX 4
14	MATRIX 5
15	MATRIX 6
16	MATRIX 7
17	MATRIX 8

HEX	MUTE
50	STEREO 1
51	STEREO 2
52	STEREO 3
53	STEREO 4
54	MAIN L
55	MAIN R
56	MAIN C

HEX	MUTE
20	CH 1
21	CH 2
22	CH 3
23	CH 4
24	CH 5
25	CH 6
26	CH 7
27	CH 8
28	CH 9
29	CH 10
2A	CH 11
2B	CH 12
2C	CH 13
2D	CH 14
2E	CH 15
2F	CH 16
30	CH 17
31	CH 18
32	CH 19
33	CH 20
34	CH 21
35	CH 22
36	CH 23
37	CH 24

HEX	MUTE
38	CH 25
39	CH 26
3A	CH 27
3B	CH 28
3C	CH 29
3D	CH 30
3E	CH 31
3F	CH 32
40	CH 33
41	CH 34
42	CH 35
43	CH 36
44	CH 37
45	CH 38
46	CH 39
47	CH 40
48	CH 41
49	CH 42
4A	CH 43
4B	CH 44
4C	CH 45
4D	CH 46
4E	CH 47
4F	CH 48

Pressing any input or output channel MUTE switch transmits a MIDI Note On message. Similarly, receiving a MIDI Note On message will turn the associated channel mute on or off, unless the channel has been made automation safe.

Console mutes are mapped to MIDI Note numbers as shown in the table. Running status is supported on receive and transmit.

**Transmit.** Pressing a channel MUTE switch transmits the following Note On messages:

9n cc vv 9n cc 00

Where n = console MIDI channel number  
cc = input or output channel number  
vv = 3FH for mute off, 7FH for mute on

**Receive.** The console responds to the following MIDI Note On message:

9n cc vv (00 is ignored)

Where vv < 40 = mute off,  
40 <= vv <= 7F = mute on

## Snapshot Memories

Recalling a snapshot will transmit a MIDI Program Change message. Receiving a Program Change message will recall a snapshot.

Snapshot numbers 1 to 128 are mapped to MIDI Program Change numbers 0 to 127. Running status is supported on receive and transmit.

**Transmit and Receive.** The message format is:

Cn pp

Where n = console MIDI channel number  
pp = console snapshot number 00 to 7F

## MIDI AFL Messages

SysEx message strings are transmitted each time an output channel AFL switch is selected or released. These are for use with **BSS** and **dbx** speaker management systems to automatically select the remote control surface associated with the output being AFL monitored.

### BSS Omnidrive

F0 00 20 18 7F 20 tx\_event F7

### dbx Drive Rack

F0 00 01 1E 7F 7F 20 tx\_event F7

These messages are subject to further development and addition. Please check the Allen & Heath Web site for the latest information.

## Archiving the Console Settings

The console settings can be saved to an external device such as a MIDI sequencer or data archiver using the dump out facility. Saved settings can be loaded back into the console using dump in. This is ideal when you want to archive the settings to use at a later date, for example a re-run of a previous performance. You can also use the dump facility to program additional **ML5000** consoles, for example when setting up duplicate shows or swapping consoles around. Simply link MIDI OUT from one to MIDI IN of the other and action the dump out facility.

### Settings which are archived :

- ✓ Current mute settings
- ✓ Current Mute group assignments
- ✓ Current VCA group assignments
- ✓ Automation safes
- ✓ Solo-in-Place safes
- ✓ All snapshot memories

### Settings which are not archived :

- ✗ Current console operating mode
- ✗ Current PAFL selection and settings
- ✗ Store and auto-increment on/off

## MIDI Dump Out

Connect the console to a suitable MIDI archiving device. Set the same MIDI channel number on both. Check the rear switch is set to MIDI. Hold down SHIFT **M9** and press STORE **M4**. The console dumps the current settings and memory contents using a SysEx message string. During this time **dPo** is displayed. Note that this operation can take up to 10 seconds during which time the console mutes, assignment, SIP and P/AFL operations will be interrupted.

## MIDI Dump In

Connect the console to the MIDI archiving device. Set the same MIDI channel number on both. Check the rear switch is set to MIDI. Start the process using the MIDI archiver. The console current settings and memory contents are overwritten. During this time **dPI** is displayed. Note that this operation can take a while during which time the console mute, assignment, SIP and PAFL operations will be interrupted.

If you are using a MIDI sequencer to record the dump out data string then make sure you play it back at the same speed you recorded it. If you dump it back into the console faster than it was recorded some data may not load correctly.

## MIDI Dump Message Format

The format for dump out and in is identical. The dump data string is made up of multiple System Exclusive messages (known as packets) which contain the console information.

**Transmit and Receive.** The format for a single packet is as follows:

F0 <SysEx header> <packet type> <packet number> <data> <checksum> F7

<SysEx header> = 00 00 1A 50 07 VV vv nn

Where VV = software version number – unit  
vv = software version number – decimal  
nn = console MIDI channel number

<packet no.> = packet number from 0 to 127

<data> = block of console data (7-bit format)

<checksum> = checksum to allow error detection

## MIDI Dump Errors

If the console or connected equipment fails to respond to a MIDI dump then check:

- The MIDI cable is good and correctly plugged
- The same MIDI channel number is selected
- The rear panel switch is set to MIDI
- Try again

If a data error is detected during a dump out or in the console display will show an error message code:

<b>Er1</b>	Buffer overflow
<b>Er2</b>	Packet out of sequence / missing
<b>Er3</b>	Checksum error / corrupt data
<b>Er4</b>	Invalid packet length
<b>Er5</b>	Input timeout
<b>Er6</b>	Unsupported block type
<b>Er7</b>	Invalid scene number
<b>Er8</b>	Block size error

## Allen & Heath ML Archiver

The ML Archiver Windows™ utility for the PC can be downloaded from the Allen & Heath Internet site. This can be used to archive data to and from the PC via MIDI or RS232.

Check the Allen & Heath Web site for further details and loading instructions.

# Operating Software Technical Support

## Operating Software Version Number

The version number is briefly shown on the snapshot display on power up. Make sure the system amplifiers are muted or turned off before switching the console on or off. This example displays version **1.20**

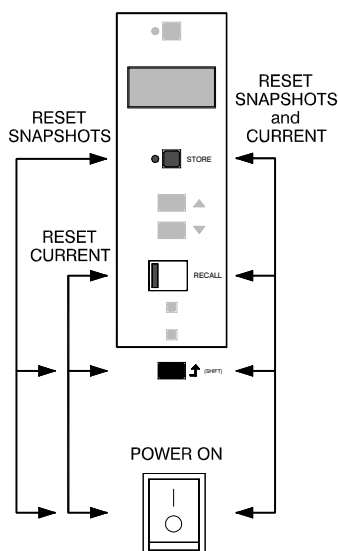


## Loading New Operating Software

Check the Allen & Heath Web site for the latest version of console software. New software is loaded from a PC via the RS232 port.

**IMPORTANT ! The current console settings and snapshots may be lost when you load new operating software.** If you wish to keep your settings and snapshot contents, first archive them using the dump out facility. Restore these after loading the new software by using dump in.

Download the software from the Allen & Heath Web site to your PC computer. Connect the PC RS232 port to the console RS232 port using a standard pin-to-pin (not null modem) 9-pin serial cable. Set the console rear panel switch to the RS232 position. Power up the console. The snapshot display should read **UPd** (update) as the console awaits data from the PC. Follow the instructions provided on the Web site for loading the new software into the console. When completed make sure you set the console rear panel switch back to the MIDI position.



## Power Up and Power Down

The console settings are saved when power is removed. On power up these settings are restored.

## To Reset the Console Settings

Hold down SHIFT and RECALL while turning on the console to reset all current settings. This does not affect the contents of the snapshot memories. The default settings are restored:

- Selects normal console operating mode
- Clears current P/AFL selections
- Clears all current Mute Group assignments
- Clears all current VCA Group assignments
- Clears all channel automation safes
- Restores the default SIP safes
- Enables the snapshot store function
- Turns off recall auto-increment

## To Reset the Snapshot Memories

Hold down SHIFT and STORE while turning the console on to clear all the snapshot memories. This does not affect the current console settings. For all snapshots:

- Clears all stored mutes
- Clears all stored VCA Group assignments

## To reset all Settings and Memories

Hold down SHIFT, RECALL and STORE together while turning the console on to clear all current settings and the memories.

## Contacting Allen & Heath

If you have any queries about the automation system please quote the console model, serial number and operating system version number in any communication with Allen & Heath or your appointed service agent. Technical support is available through your dealer or by visiting the Allen & Heath Internet Web site.

[www.allen-heath.com](http://www.allen-heath.com)

# Servicing the Input Fader assembly

Before beginning any service work, remove all power to the unit and disconnect any signal cables where necessary. Ensure adequate lighting and use the correct tools.

Remove the numbered Ident strip by placing a flat headed screwdriver under one end and prizing it upwards. Remove the Ident strip by 'peeling' it from one end of the console to the other.

Remove the 3x 6Bx3/8 Countersunk Pozi Zinc Screws from the top of the fader panel (**A**) and the 3x 6Bx3/8 Flange Headed Pozi Black Screws from the bottom of the fader panel, taking care to retain the plastic washers (**B**) (see fig.1). Carefully tilt the fader panel assembly out from the console and remove all connecting IDC wireforms. The fader panel assembly can now be removed from the console.

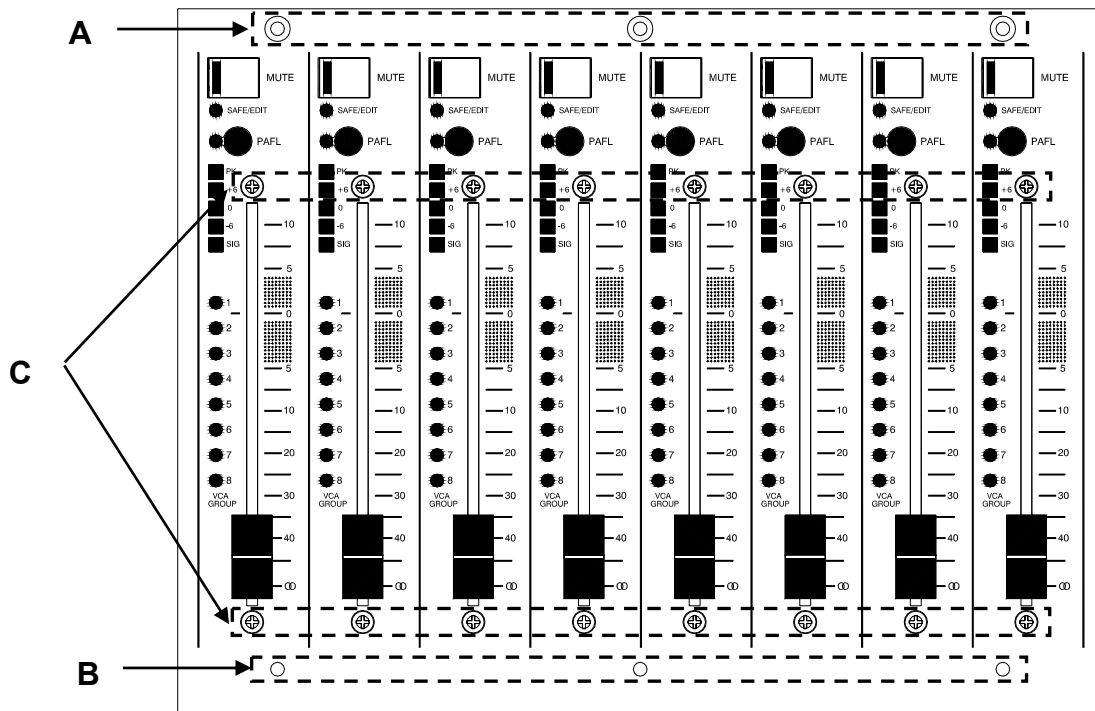


fig.1

- 3) Flip the fader panel over and remove the 2x 4ABx5/16 Countersunk Pozi Black Screws (**D**) from the **Fader Slave PCB** (see fig.2)

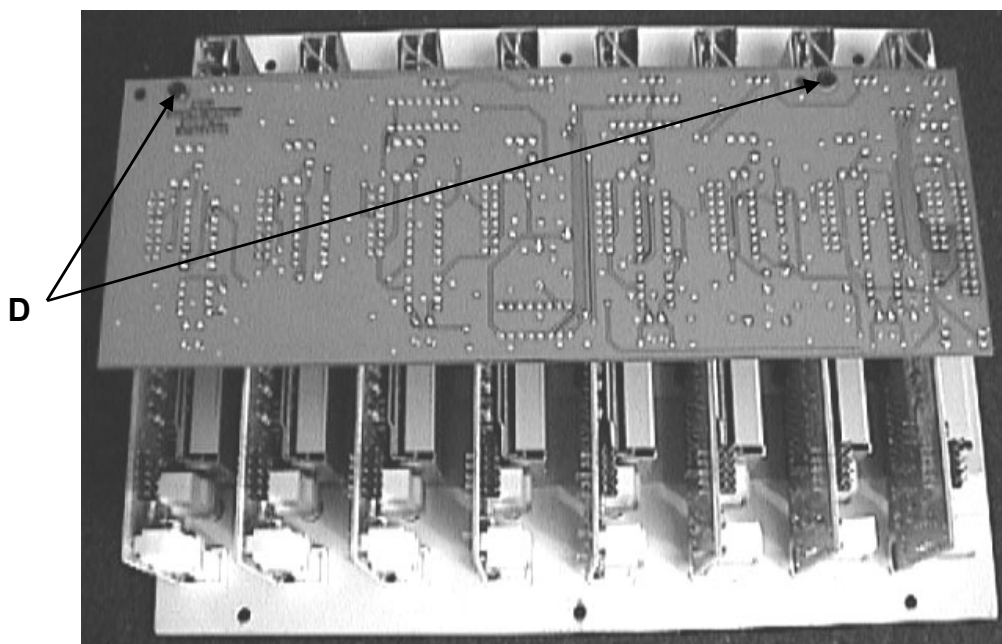


fig.2

- 4) Carefully remove the **Fader Slave PCB** from the **Mono Fader PCBs** by pulling it upwards from the fader boards.
- 5) Once removed, turn the **Fader Slave PCB** over (see fig.3)

To remove a **Mono Fader PCB**, use a 5.5mm spanner to remove the relevant M3x4 Taptite Hex Headed Screws (**E**) that attach the **Mono Fader PCBs** to the **Input Fader Bracket** (see fig.3).

To remove a fader remove the two relevant M3x5 Countersunk Pozi Screws with under-head pips (**C**) as shown in fig.1. Then unplug the fader wireform from the **Fader Slave PCB**, the fader can now be removed. De-solder the three fader wireform wires from the fader, taking note of the wire positions for refitting.

**Note:** A fader can be removed without removing the IDC wireforms and Slave PCB.

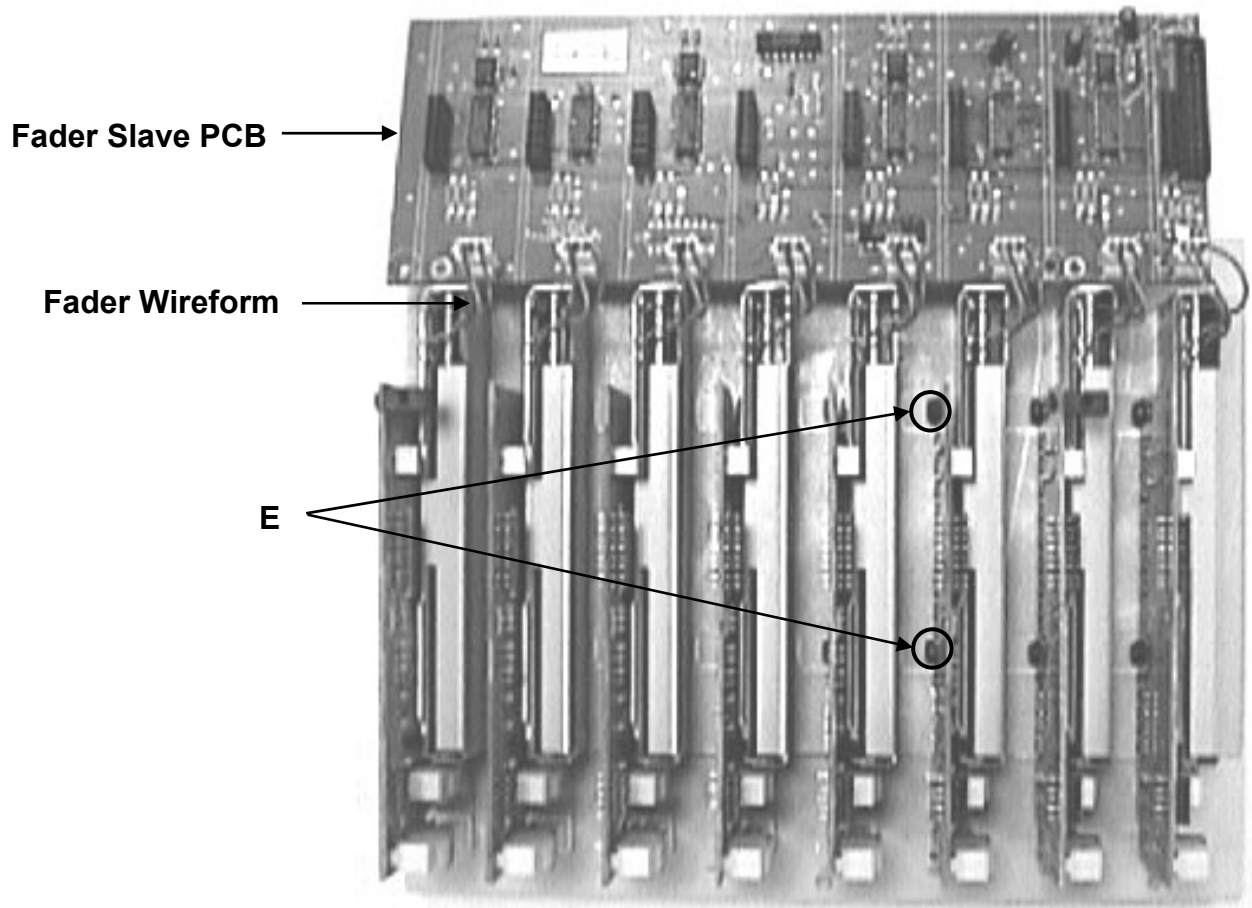


fig.3

To refit any of the PCB/Fader assemblies, follow the above procedure in reverse order. **Ensure all connectors and harnesses are correctly aligned and plugged on.** Test for correct operation.

# Servicing the Master Fader assembly

Before beginning any service work, remove all power to the unit and disconnect any signal cables where necessary. Ensure adequate lighting and use the correct tools.

Remove the numbered Ident strip by placing a flat headed screwdriver under one end and prizing it upwards. Remove the Ident strip by 'peeling' it from one end of the console to the other.

Remove the 5x 6Bx3/8 Countersunk Pozi Zinc Screws from the top of the fader panel (F) and the 5x 6Bx3/8 Flange Headed Pozi Black Screws from the bottom of the fader panel, taking care to retain the plastic washers (G) (see fig.4). Carefully tilt the fader panel assembly out from the console and remove all connecting IDC wireforms. The fader panel assembly can now be removed from the console.

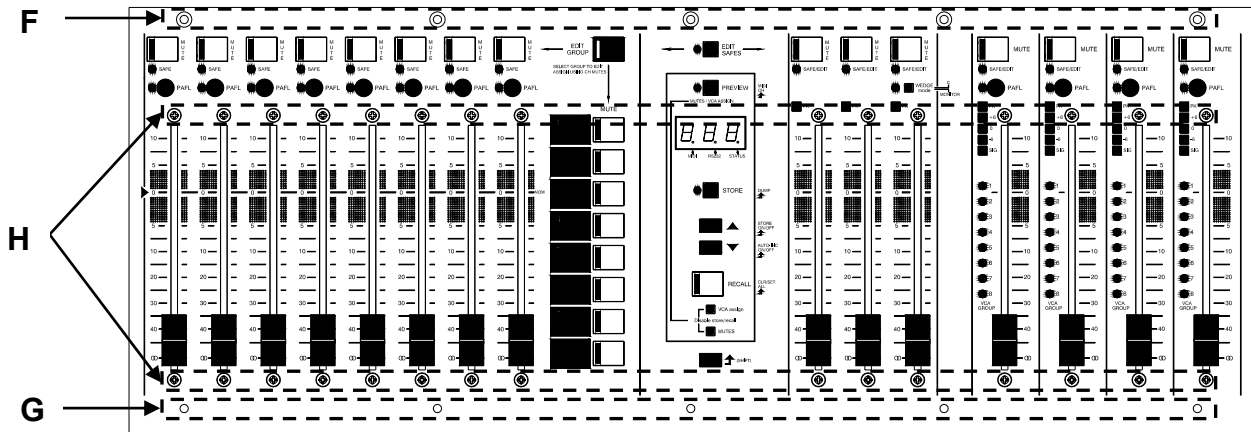


fig.4

Flip the fader panel over to reveal the PCB assemblies (see fig.5).

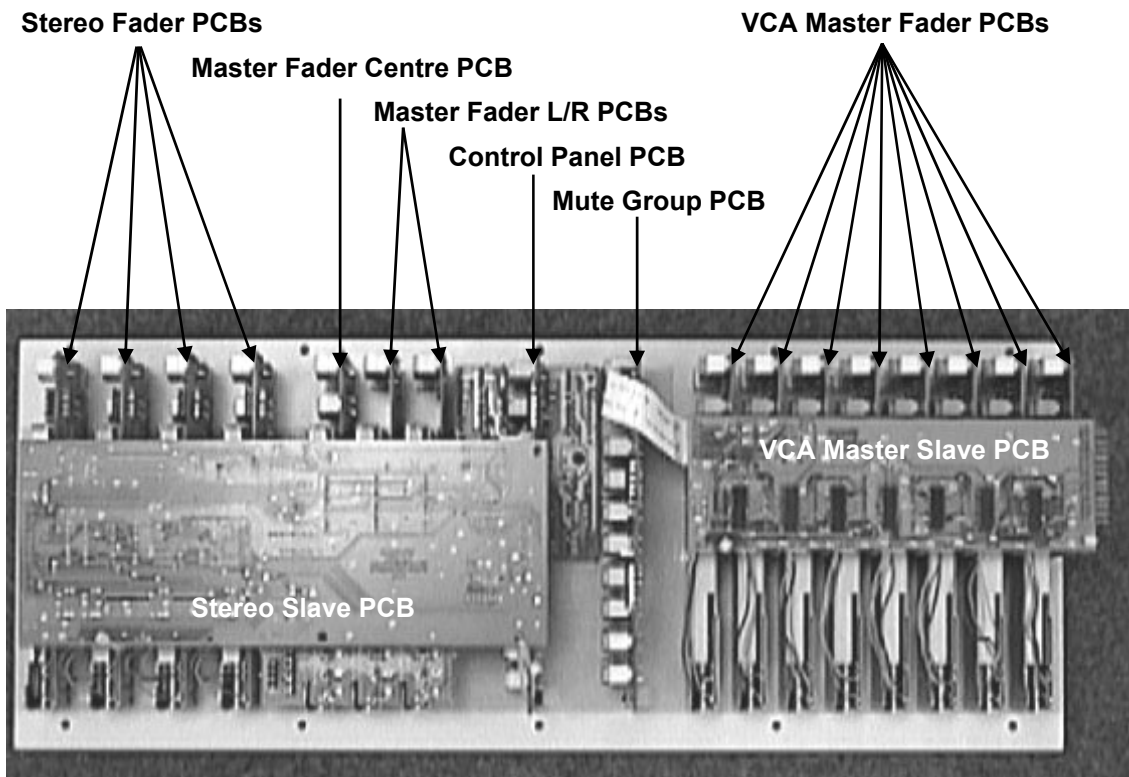


fig.5



The **Stereo Slave PCB** must be removed before the following PCBs can be removed; **Mono Fader, Master Fader Centre, Master Fader L/R & Control Panel**.

- 1) Cut the 2x Cable ties attaching the **Stereo Slave PCB** onto the **Mono Fader & Control Panel PCBs**.
- 2) Carefully remove the **Stereo Slave PCB** by pulling it upwards.
- 3) Once removed, turn the **Stereo Slave PCB** over.
- 4) To remove a PCB, use a 5.5mm spanner to remove the relevant M3x4 Taptite Hex Headed Screws that attach the PCBs to the **Master Fader bracket**.
- 5) To remove a fader, remove the two relevant M3x5 Countersunk Pozi Screws with underhead pips (**H**) as shown in fig.4. Then unplug the fader wireform from the **Stereo Slave PCB**, the fader can now be removed. De-solder the three fader wireform wires from the fader, taking note of the wire positions for refitting.
- 6) Removal of the 'H' shaped **Control Panel PCB** can only be achieved once the vertical section of PCB has been removed. Once the vertical section has been removed, remove the 2x M3x6mm Pan Pozi Black screws attaching the 'H' shaped **Control Panel PCB** to the fader bracket. The 'H' shaped **Control Panel PCB** can then be removed.
- 10) To remove the **Mute Group PCB**, use a 5.5mm spanner to remove the two screws attaching the PCB to the fader bracket.

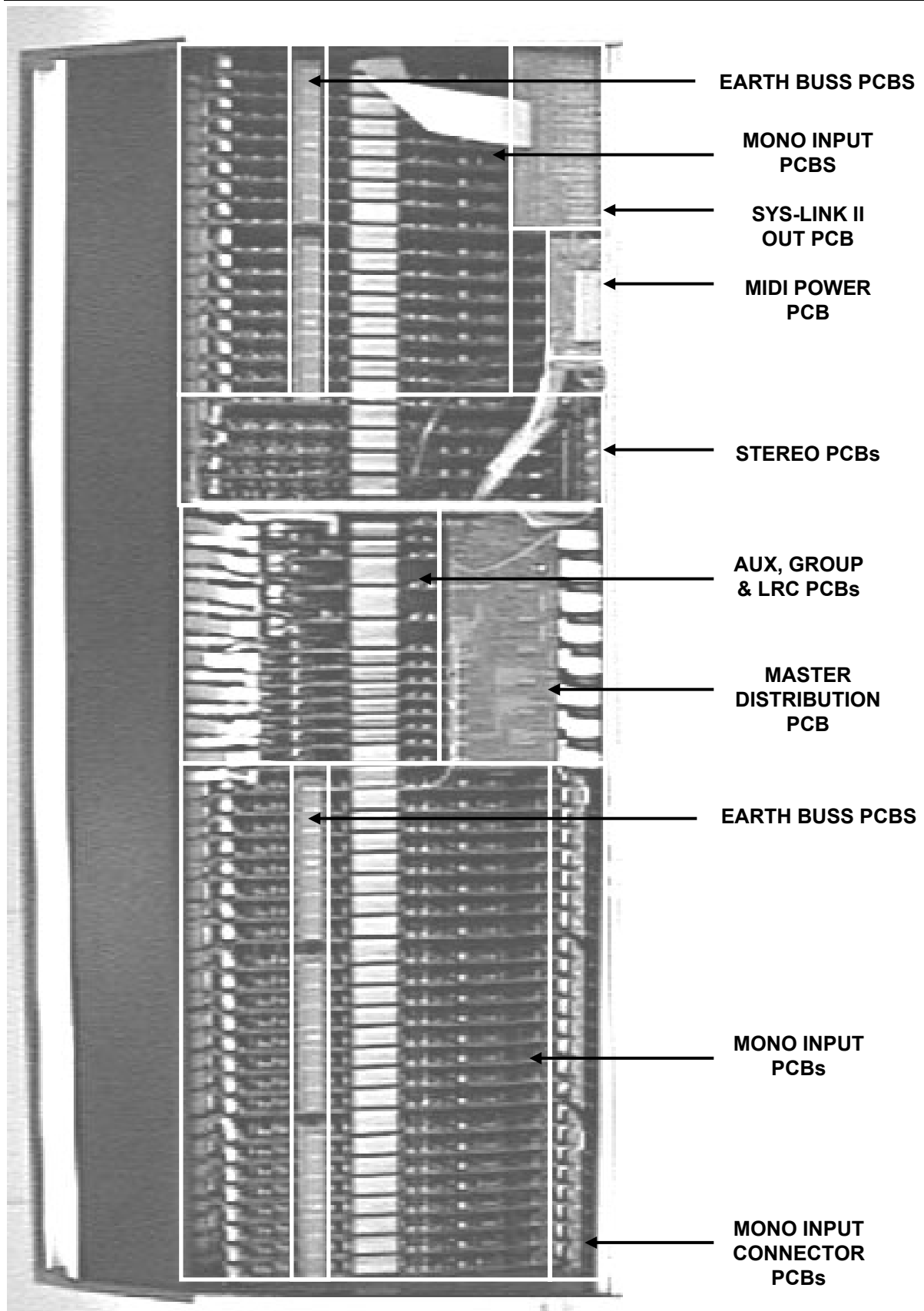
The **VCA Master Slave PCB** must be removed before the **Master Fader PCBs** can be removed.

- 11) Cut the 2x Cable ties attaching the **VCA Master Slave PCB** onto the **Master Fader PCBs**.
- 12) Remove the 15way Flexi cable running between the **VCA Master Slave PCB** and the **Mute Group PCB**.
- 13) Carefully remove the **VCA Master Slave PCB** by pulling it upwards.
- 14) Once removed, turn the **VCA Master Slave PCB** over.
- 15) To remove a PCB, use a 5.5mm spanner to remove the relevant M3x4 Taptite Hex Headed Screws that attach the PCBs to the **Master Fader Bracket**.
- 16) To remove a fader, remove the two relevant M3x5 Countersunk Pozi Screws (**H**) from the Master Fader front panel (see fig.4). Unplug the fader wireform from the **Stereo Slave PCB**, the fader can now be removed. De-solder the three Fader wireform wires from the fader, taking note of the wire positions for refitting.  
**Note:** A fader can be removed without removing the IDC wireforms and Slave PCB.
- 17) To refit any of the PCB assemblies, follow the above procedure in reverse order. **Make sure all harnesses are aligned and plugged on.** Test for correct operation.

## Base removal and Internal PCB assemblies

Before beginning any service work, remove all power to the unit and disconnect any signal cables where necessary. Ensure adequate lighting and use the correct tools.

Before you can access the internal PCB assemblies, invert the console and remove the screws securing the base in place. Carefully lift the base off.



*Note that the Earth Strip has been removed for clarity.*

## Removing a Mono Input PCB assembly

Before beginning any service work, remove all power to the unit and disconnect any signal cables where necessary. Ensure adequate lighting and use the correct tools.

- 1) Remove the screws attaching the relevant Earth Strip running the length of the Mono section (see fig.6, right hand section only shown) then lift away the Earth Strip.

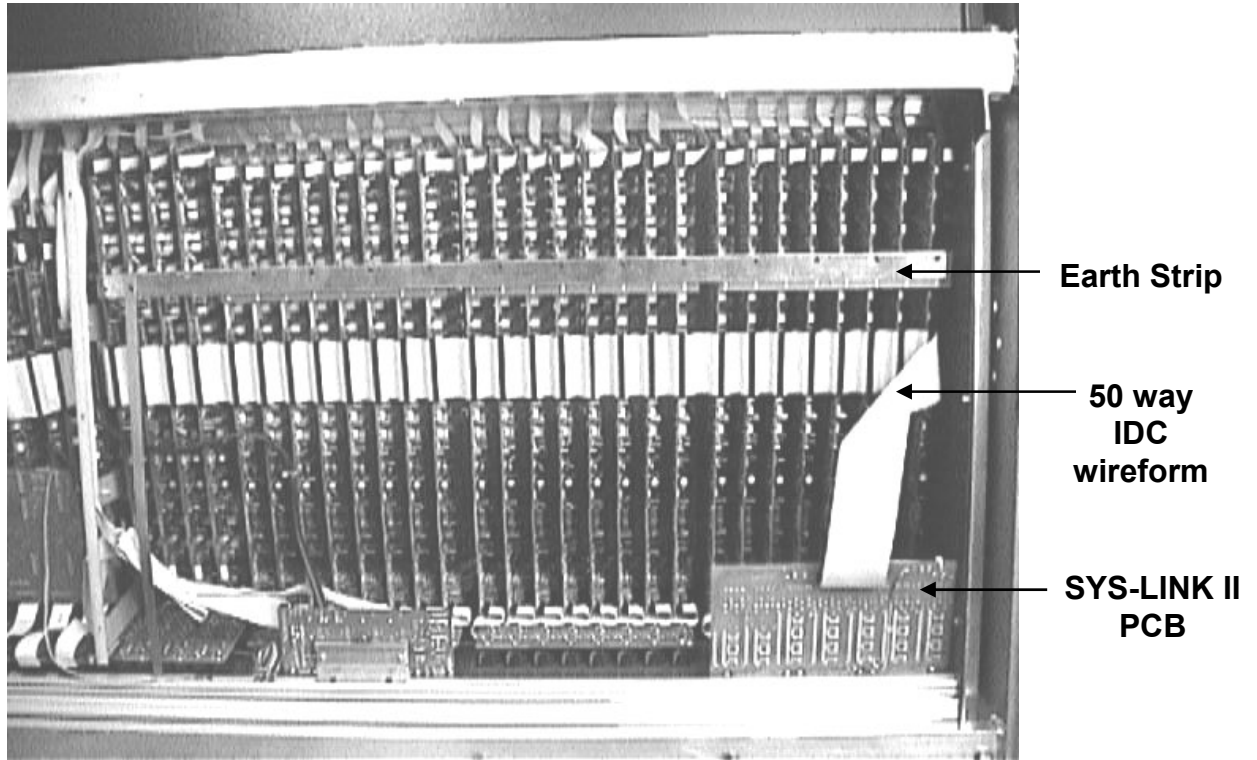


fig.6

- 2) Carefully detach the 50way IDC wireform from the **Mono Input PCBs** and the **SYS-LINK II Input PCB** as far as the relevant **Mono Input PCB**. **Note:** There are two different 50way IDC wireforms on either side of the Master section. Remove the relevant IDC wireform according to the side on which the particular **Mono Input PCB** lies.
- 3) Remove all the knob and switch caps from the required **Mono Input PCB**, then remove the pot nuts underneath using an 11mm nutdriver.
- 4) The required **Mono Input PCB** can now be removed from the console.
- 5) To refit a **Mono Input PCB** assembly, follow the above procedure in reverse order. **Make sure all harnesses are correctly aligned and plugged on.** Test for correct operation.

## Removing the Master Distribution PCB assembly

To access the Group and Auxiliary PCB assemblies it may be necessary to remove the Master Distribution PCB.

Before beginning any service work, remove all power to the unit and disconnect any signal cables where necessary. Ensure adequate lighting and use the correct tools.

- 1) Before removing the **Master Distribution PCB** assembly, the console base must first be removed.
- 2) Locate the **Master Distribution PCB** assembly positioned near the centre of the console (see fig.7).

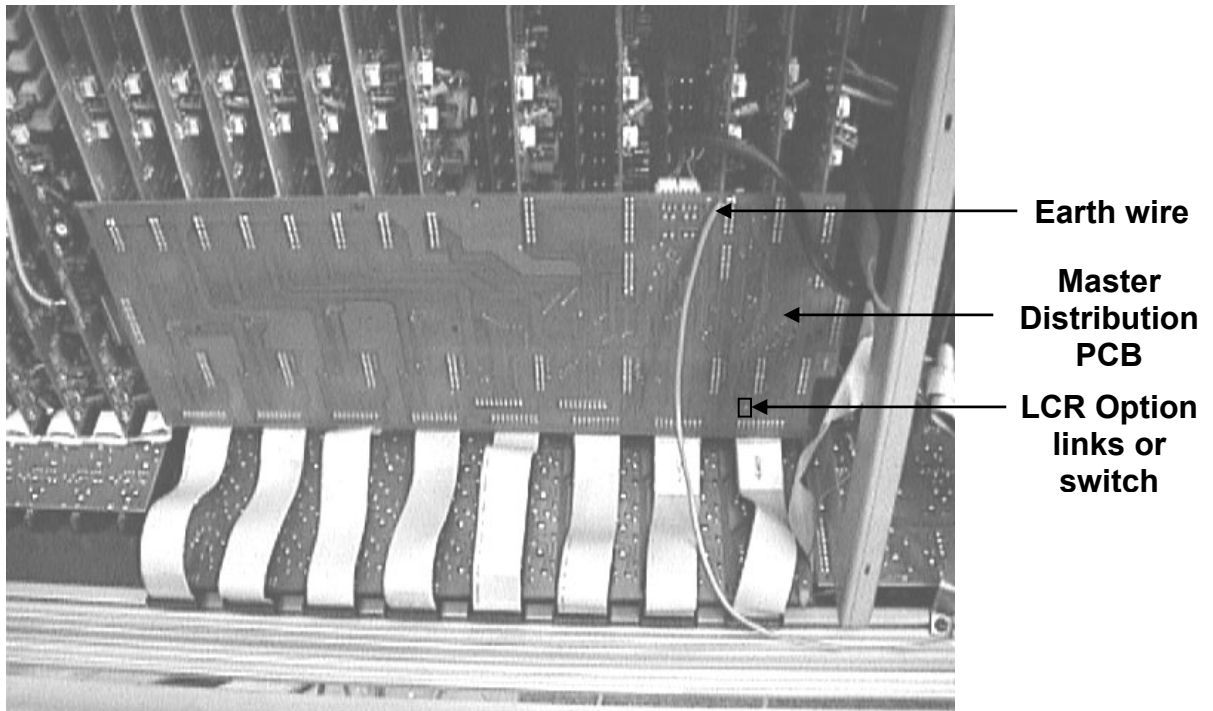


fig.7

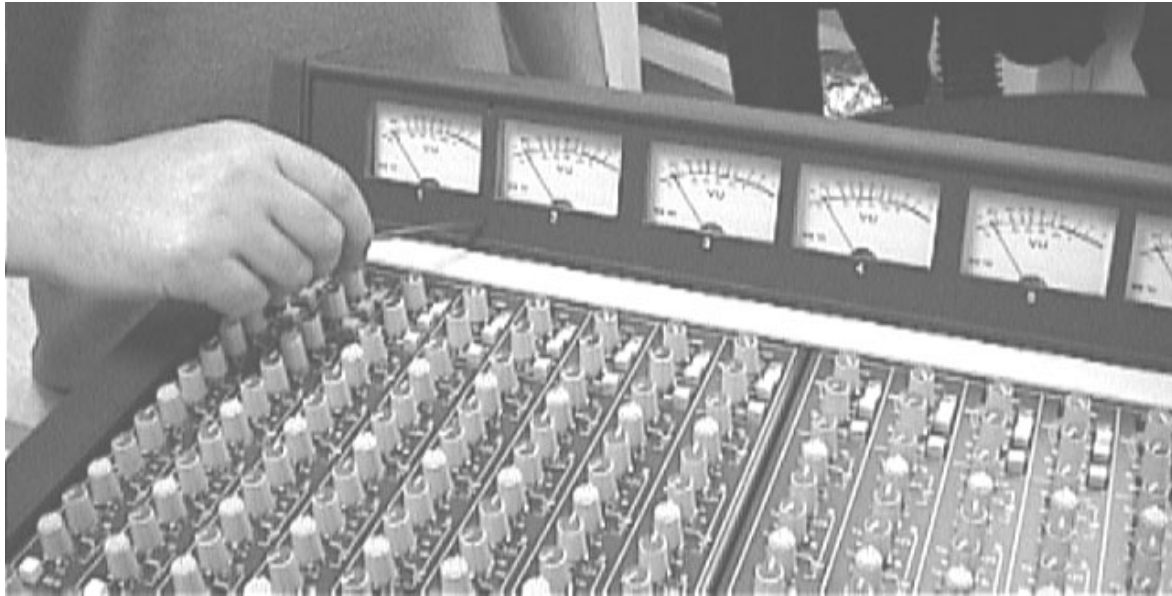
- 3) Unplug all attaching IDC wireforms from the **Master Distribution PCB** assembly.
- 4) Desolder the Earth wire from the PCB then carefully remove the **Master Distribution PCB** by pulling it away from the console.
- 5) To refit the **Master Distribution PCB** assembly, follow the above procedure in reverse order. Use an inspection mirror to check that each connector and IDC harness is correctly aligned and plugged on. **Note:** If a switch is fitted to the rear of the **Master Distribution PCB** rather than solder links then make sure that it is set correctly. Test for correct operation.

## **Servicing the Meterbridge Assembly**

---

Before beginning any service work, remove all power to the unit. Ensure adequate lighting and use the correct tools.

- 1) Remove all the plastic snap-in rivets along the face of the meter panel with your fingernails or other non-abrasive tool.
- 2) With a person standing at either end of the console, each using a small, thin screwdriver, place the screwdriver through each of the endmost bottom rivet holes (see fig 8). Raise the meter panel up with the screwdrivers so that the bottom becomes free of the extrusion.



**fig.8**

- 3) The complete meter panel assembly can now be removed from the meter pod extrusion by pulling it away from the extrusion, bottom first (see fig.9), allowing access to the Meter PCB assemblies. Remove the two attaching IDC harnesses.



**fig.9**

# Servicing the MPS14 Power Supply

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## Cleaning and Replacing the fan filters.

---

At regular intervals, it is recommended that the foam fan filters are cleaned or replaced to ensure efficient operation of the power unit. Failure to do so may reduce the efficiency or even damage the power unit.

To remove the fan filters, switch off and disconnect all power to the MPS14. Remove the rack ears and place to one side. Remove the cover fixing screws and cover and place to one side.

The foam fan filters can now be removed by simply sliding out of the slots.

Either clean or fit new filters depending on their condition.

Replace the filters and reassemble the power unit. Check the fans are running unobstructed before completely re-installing.

## Replacing the mains fuse

---

The AC mains fuse is located on the rear of the MPS14 unit next to the AC mains connector. In the event of a mains surge or under-rated fuse value, the mains input fuse will rupture. Switch off the power supply and remove the mains lead plug from the "MAINS INPUT" socket on the rear of the unit.

Check the fuse and replace if necessary.



**TO AVOID THE RISK OF FIRE REPLACE FUSE WITH THE CORRECT TYPE ONLY, AS INDICATED ON THE UNIT**

AC~ mains input voltage	Fuse type
100V – 230V ± 10%	T 5A 250V 20mm

In the event of repeated failure of the mains fuse, consult the local dealer from where the unit was purchased.

## ORDERING A CONSOLE

To order a new console please specify the model number and AC mains voltage for the Power Supply.

MODEL	DESCRIPTION	ORDER CODE
<b>ML5000-32</b>	32 Mono + 4 Stereo Input Channels	ML5000-32
<b>ML5000-40</b>	40 Mono + 4 Stereo Input Channels	ML5000-40
<b>ML5000-48</b>	48 Mono + 4 Stereo Input Channels	ML5000-48
<b>MPS14</b>	Power Supply for ML5000	MPS14/*

\* - Specify the voltage and mains plug requirement for your area.

## ORDERING AN ACCESSORY

To order an option please specify the model number required.

MODEL	DESCRIPTION	ORDER CODE
<b>SIDECAR EXPANDER</b>	OPTIONAL 24 MONO INPUT SIDECAR	ML5000-24SC
<b>DC POWER LEAD</b>	2.9 METRE DC POWER LEAD	002-583
<b>DC COMBINER LEAD</b>	0.75 METRE DC COMBINER LEAD	002-584
<b>SYS-LINK CABLE</b>	2.8 METRE 37 WAY AUDIO CABLE	002-617
<b>LOGIC CABLE</b>	2.9 METRE 9 WAY LOGIC CABLE	AL4155
<b>GOOSENECK LAMP</b>	18" GOOSENECK LAMP	AL4061
<b>32 CHANNEL DUSTCOVER</b>	32 CHANNEL VINYL DUSTCOVER	AP4121
<b>40 CHANNEL DUSTCOVER</b>	40 CHANNEL VINYL DUSTCOVER	AP4122
<b>48 CHANNEL DUSTCOVER</b>	48 CHANNEL VINYL DUSTCOVER	AP4123
<b>SIDE-CAR DUSTCOVER</b>	SIDECAR VINYL DUSTCOVER	AP4234

## MANUALS AND SUPPORT DOCUMENTATION

MODEL	DESCRIPTION	ORDER CODE
<b>ML5000</b>	User Guide	AP3736
<b>ML5000 SIDECAR</b>	User Guide	AP4124
<b>MPS14 POWER SUPPLY</b>	User Guide	AP3898

## SERVICE TOOLS

The tools required to service the **ML5000** are standard to an electronics service workshop and are easily obtainable. The following items are necessary for disassembly and service access:

TOOL	USE	ORDER CODE
4mm Hexagon (Allen) key	M6 side trim	AT0033
1-point Crosshead screwdriver	M3, 4AB	AT0004
2-point Crosshead screwdriver	M4, 6AB, 8B	AT0002
11mm AF Nutdriver	Potentiometer and headphone nuts	
12mm Nutdriver	Jack nuts	
1.27mm Hexagon (Allen) key	PSU DC Leads	AT4142
2.5MM hexagon (Allen) key	M4 Sidetrim	
5.5mm AF Spanner	Fader PCB M3 Hex	
5mm Nutspinner	D-Type Screws	

## **ORDERING AN ASSEMBLY**

---

The following assemblies for the **ML5000** are supplied fully tested. Please quote the description and order code for the part required.

### **Printed circuit board (PCB) assemblies:**

<b>DESCRIPTION</b>	<b>ORDER CODE</b>
Mono Input PCB assembly	002-529
Stereo Input PCB assembly	002-564
Group 1, 3, 5, 7 PCB assembly	002-552
Group PCB assembly	002-553
Group 2, 4, 6, 8 PCB assembly	002-554
Aux 10 PCB assembly	002-545
Aux 12 PCB assembly	002-546
Aux 14 PCB assembly	002-547
Aux 16 PCB assembly	002-548
Master Distribution PCB assembly	002-556
LCR Mix PCB assembly	002-544
Mono Fader PCB assembly	002-530
Master Fader Centre PCB assembly	002-589
Master Fader L/R PCB assembly	002-588
Master Fader VCA PCB assembly	002-557
Mute Group PCB assembly	002-563
Control Panel PCB assembly	002-549
Fader Slave PCB assembly	002-551
Stereo Slave PCB assembly	002-566
VCA Master Slave PCB assembly	002-567
Aux Master Slave PCB assembly	002-543
CPU PCB assembly	002-550
Mono Connector PCB assembly	002-560
Stereo LRC Connector PCB assembly	002-565
Master Connector PCB assembly	002-555
MIDI Power PCB assembly	002-575
Sidecar MIDI Power PCB assembly	002-598
SYS-LINK 2 In PCB assembly	002-587
SYS-LINK 2 Out PCB assembly	002-596
Meter 1-8 PCB assembly	002-558
Meter 9-16 PCB assembly	002-591
Meter Master PCB assembly	002-559
Meter Ledbar PCB assembly	002-590



**IDC connector harnesses:**

DESCRIPTION	ORDER CODE
10 way GRAUX harness	AL4029
10 way Input harness	AL4028
10 way LRC to Fader harness	AL4077
10 way MIDI harness	AL4032
16 way GRAUX harness	AL4030
20 way Master Connector harness	AL4027
20 way Meter harness	AL4021
26 way CPU Power harness	AL4033
26 way LRC Connector harness	AL4031
26 way Distribution harness	AL4020
26 way Slave A harness	AL4022
26 way Slave B harness	AL4023
26 way Slave C harness	AL4024
26 way Slave D harness	AL4025
34 way Master harness	AL4026
Sidecar harness	AL4067
ML5-32 Left harness	AL3964
ML5-32/40 Right harness	AL3967
ML5-40/48 Left harness	AL3834
ML5-48 Right harness	AL3835

**THE CHASSIS TRIM**

DESCRIPTION	ORDER CODE
ML5000 (all formats) Left & Right Chassis side trims	AA3773-L/R
Left & Right Moulded side trims	AA3781-L/R
Write-on strip 10'	AK0327
Ident strip Master Rear	AK3788
Ident strip Master	AK3833
Ident strip 1-24	AK3789
Ident strip 1-24 Rear	AK3790
Ident strip 25-48	AK3795
Ident strip 25-48 Rear	AK3796

## **ORDERING AN ML5000 SPARES KIT**

It is recommended that the spares kit order code **002-533** is held and maintained by the service agent to enable in-field service repairs to the **ML5000** independent of the ALLEN & HEATH factory. Commonly available items such as resistors, capacitors, tools and soldering equipment are not included. The contents of the kit are listed below and are supplied in a cabinet of drawers. Individual spare parts may be ordered. Please quote the description and order code for the part required.

### **Fixings:**

<b>DESCRIPTION</b>	<b>ORDER CODE</b>	<b>QTY</b>
Screw 4AB x 5/16" CSK Pozi Black	AB0059	20
Screw M3 x 8 CSK Pozi Black	AB0074	10
Nylock Nut M3	AB0102	10
Nylock Nut M4	AB0105	10
Screw 4AB x 1/2" Pan Pozi Black	AB0250	10
Screw M6 x 20 CSK Allen Black	AB0310	5
Screw 6B x 3/8 CSK Pozi Zinc	AB2082	20
Screw 8B x 3/8 CSK Pozi Black	AB2085	5
Screw 6B x 5/16 Pan Pozi Black	AB2809	20
Screw 4 x 5/16 Poly Pan Pozi Black	AB2810	20
Screw M3 x 5 CSK Pozi Black	AB2811	20
Screw M3 x 4 TT Hex Head Black	AB3837	20
Screw M6 x 10 CSK Pozi Zinc	AB4036	5
Screw 6B x 3/8 Flange Headed Pozi Black	AB4037	10
Rivet Plastic Snap SR3535B	AB4092	5
Pot Nut 9mm	AB8050	50

### **Knobs and caps:**

<b>DESCRIPTION</b>	<b>ORDER CODE</b>	<b>QTY</b>
Knob Red & Grey 11mm D	AJ2074	10
Knob Blue & Grey 11mm D	AJ2075	40
Knob Light Blue & Grey 11mm D	AJ2076	40
Knob Green & Grey 11mm D	AJ2077	15
Knob Dark Grey & Grey 11mm D	AJ2078	15
Knob Yellow & Grey 11mm D	AJ2079	10
Knob Brown & Grey 11mm D	AJ2080	10
Button 10x5mm Rectangular Grey	AJ2865	2
Button 10x5mm Rectangular Black	AJ3228	1
Fader Knob 11mm Black + White Line	AJ3503	15
Switch Cap Grey 6x6mm Offset	AJ3863	20
Button Illuminated Red	AJ3949	2
Switch Cap White Offset	AJ3950	20

Button 6x6mm Square White	AJ3951	10
Button 6x6mm Square Light Grey	AJ3952	5
Button 6x6mm Square Red	AJ3953	10
Button 6x6mm Square Black	AJ3954	5
Button 8mm Round Light Grey	AJ3955	10
Fader Knob 11mm White+Black Line	AJ8078	10
Fader Knob 11mm Red+Black Line	AJ8079	10
Fader Knob 11mm Yellow+Black Line	AJ8080	5
Fader Knob 11mm Blue+Black Line	AJ8081	10
Button Illuminated White	AJ8107	10

### **Faders, Potentiometers, Switches and connectors:**

Pot 10KC x 2 (103C 14mm wide)	AI0150	3
Pot 20KK (203K 11mm wide)	AI8003	5
Pot 20KB C/D (203B 11mm wide)	AI8004	5
Pot 200KC x 2 (204C 11mm wide)	AI8005	5
Pot 20KB x 2 centre click (14mm wide)	AI8006	5
Pot 20KK x 2 (203K 14mm wide)	AI8007	10
Pot 10KAC x2 (103AC 14mm wide)	AI8008	10
Pot 200KC x 2 (204C 14mm wide)	AI8009	5
Fader 10KSPE 100mm	AI8109	3
Pot 5K (502RD 11mm wide)	AI8111	5
Fader 10KB 100mm	AI8175	10
Fader 10KA 60mm	AI8176	5
Switch 2PCO Latching 90 Deg	AL0162	10
Jack Socket Headphone	AL0328	1
Switch 4PCO Latching	AL0333	15
Switch 2PCO Momentary	AL0374	10
XLR 3 Pin Female Vertical PCB Mount	AL2410	5
XLR 3 Pin Male Vertical PCB Mount	AL2411	5
Switch Slide MINI SPDT PCB	AL3081	1
Jack Socket ¼" Stereo Unswitched	AL3407	20
Jack Socket ¼" Stereo Switched	AL3410	20

### **LEDs and Semiconductors:**

Transistor BC549 NPN	AE0020	5
IC TLO72 Op-Amp	AE0046	10
Transistor J111N FET T092	AE0083	10
LED 3mm T1 Yellow	AE0084	10
LED 3mm T1 Green	AE0085	10
LED 3mm T1 Red	AE0086	10

IC CMOS 4053B	AE0117	10
IC CMOS 4051B	AE0118	1
IC NE5532 Op-Amp	AE0221	10
IC 6N136 Opto-Isolator	AE0222	1
IC TTL 74LS00	AE0243	1
IC Opto-Isolator 4N35	AE0266	2
IC 7805 Regulator	AE0308	3
IC SSM2018P VCA	AE0315	5
IC RS232 HIN202CP	AE2742	1
IC CMOS 74HC165	AE2749	3
IC CMOS 74HC4094N	AE2755	5
IC Comparator LM393N	AE2818	5
Transistor BC556B PNP	AE3001	5
Crystal 14MHz	AE3007	1
LED Square Red	AE3489	5
LED Square Green	AE3490	10
LED Square Yellow	AE3491	5
Transistor Mosfet BSS138	AE3498	1
IC LA6515 Power Op-Amp	AE3707	3
IC CMOS 74HCT02	AE3988	1
IC SN75176BP Buffer	AE3989	1
LED Rect. Red 5 x 2.5mm	AE4015	3
LED Rect. Yellow 5 x 2.5mm	AE4016	3
LED Rect. Green 5 x 2.5mm	AE4017	3
LED T1 3mm Blue	AE4041	3
Transistor 2SB737 PNP	AE8069	10

**Miscellaneous:**

Preset 10K Carbon Horizontal Mini	AC0250	5
Preset 470K Carbon Horizontal Adjust	AC4012	5
Meter bulb	AD0013	5
VU Meter + 8V Bulb	AD3321	2
Flex Cable 12 Way 90mm	AH2228	5
Flex Cable 15 Way 90mm	AH4091	3
Battery 2.4V 70mAh NICAD	AP3334	1

## ORDERING AN MPS14 SPARES KIT

It is recommended that the spares kit order code **002-632** is held and maintained by the service agent to enable in-field service repairs to the **MPS14** independent of the ALLEN & HEATH factory. Commonly available items such as resistors, capacitors, tools and soldering equipment are not included. The contents of the kit are listed below and are supplied in a cabinet of drawers. Individual spare parts may be ordered. Please quote the description and order code for the part required.

### Power supply:

DESCRIPTION	ORDER CODE	QTY
Insulating Kit TO220	AA3514	5
Insulating Pad TDA7294 IC	AA3645	4
Screw M3x 6mm Pan Pozi Black	AB0072	10
Screw M3 x 8mm Pan Pozi Black	AB0073	3
Screw M3 x 10 Pan Pozi Black	AB0076	10
Nylock Nut M3	AB0102	5
Pillar M4 x 10 Nylon Tap	AB0257	3
Screw M4 x 5 Pan Slotted Zinc	AB0261	10
Screw M4 x 8 Countersunk Pozi Black	AB2777	5
Screw 6B x 5/16 Pan Pozi Black	AB2809	10
Screw 4 x 5/16 Poly Pan Pozi Black	AB2810	10
Clip TO220 Type 4426	AB3547	3
Clip TO247 Type MAX03	AB4069	3
Clip TO220 Type MAX10	AB4099	3
Clip TO247 Type 4597	AB4148	3
Res W/Wound 0R33 2.5W 5%	AC3014	3
Preset 1K Carbon Vertical Adjust	AC3958	1
Res Planar 10R 10W	AC4002	2
Zener Diode BZX85 5V6 1.3W	AE0012	3
IC TL072 Dual Op-Amp	AE0046	3
IC 7815 Regulator	AE0047	2
Transistor BC637 NPN TO92H	AE0068	2
IC LM339N Quad Comparator	AE0071	3
IC Adjustable Regulator 783	AE0214	2
IC Op-Amp NE5532N	AE0221	3
Zener Diode BZX55C2V7	AE0231	2
Zener Diode BZX79C 12V 400mW	AE0232	2
IC Regulator 7818	AE3155	2
Diode BYW81P-200 15A	AE3468	2
Diode BYV27-400 2A	AE3469	3
Diode BYV26E 1A 1000V	AE3470	3
Diode P6KE200A	AE3471	3
Transistor Mosfet STP4NA80FP	AE3472	3

IC SMPS UC3842AN	AE3473	2
Bridge Rectifier 2KBP04M	AE3477	2
Thermistor 100K	AE3499	2
LED Rect. Green 5 x 2mm Flat Top	AE3501	2
LED Rect. Red 5 x 2mm Flat Top	AE3502	3
IC Regulator 7812	AE3588	2
Zener Diode BZV85 20V 1.3W	AE3815	2
Diode 1N5819 1A 40V	AE3914	3
Bridge Rectifier RBV2506	AE3921	2
Transistor Mosfet IRF540N	AE3924	2
Transistor Mosfet IRF9540N	AE3925	2
Transistor Mosfet IRFP450	AE3926	3
Diode RURP3060 30A 600V	AE3933	3
Diode SQ045 8A 45PIV	AE3934	3
Diode SF64 8A 80PIV	AE3935	3
IC SG3525AN PWM Control	AE3938	3
IC UC3854AN PFC Control	AE3939	3
Transistor Mosfet ZVN2106A	AE3940	2
Transistor Mosfet ZVP2106A	AE3941	2
Transistor MPSA92 PNP	AE8119	1
Transistor MPSA42 NPN	AE8138	1
Inrush Supressor	AE8143	1
Fastfoot	AK0102	4
Foam Filter 80 x 80mm	AK4070	3
Fuse 6.3A Anti-Surge 20mm	AL0395	5
Fuse 1.6A Anti-Surge 20mm	AL0466	5
Fuse 5A Anti-Surge 20mm	AL2270	5
Fuse Holder 10A 20mm PCB	AL3447	1
Fuse 500mA Anti-Surge 20mm	AL3534	5
Switch 2PCO Latching Vertical	AL8057	1
Inductor 4.7uH 600mA	AM3467	5
Fan 80x80x25 12V DC	AM3517	1
Inductor Ferrite Sleeve	AM3657	3
Inductor 5MH 5A CMC	AM3900	1
Inductor 330UH 1A	AM3901	1
Inductor 150UH	AM3902	1
Inductor 10UH	AM3903	1
Inductor 1MH	AM3904	1
Transformer HF Pulse PCB	AM4006	1

The channel cue sheet is a grid of controls for 8 channels. Each channel's controls are as follows:

- Gain Section:** Gain knob, 48V PAD, and a 3-band EQ with LOW, MID, and HIGH frequency sliders.
- EQ Section:** EQ IN knob and a 4-band parametric EQ with PRE, ALX, STG, and PRE sliders.
- Filter Section:** A 10-band stereo filter with LEV and PAN sliders for bands 1 through 10.
- Blend Section:** LOW BLEND knob and a MAIN MIX knob.
- Master Section:** MUTE button, SAFEDIT indicator, PAFL knob, and a vertical fader with a UCA GROUP label.

# ML 5000 ALLEN & HEATH

Matrix 1 through Matrix 8, each featuring 8 channels with controls for L, R, C, TB, LEV, MUTE, SAFEBERT, and AFL.

Post-Stage Aux 1 through Post-Stage Aux 8, each with controls for AFL and SAFEBERT.

AUX 1 through AUX 8, each with controls for MARK, LEV, PAN, MUTE, SAFEBERT, and AFL.

Meters section with Meters 1-8, each with a frequency spectrum display and controls for MUTE, SAFEBERT, and AFL.

Stereo 1 through Stereo 4, each with controls for A ON, B ON, MONO L, MONO R, HE, LF, HF, EG IN, PFE, and various level controls.

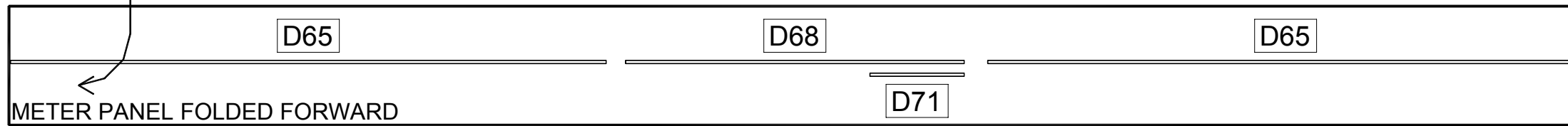
VCA 1 through VCA 8, each with controls for MUTE, SAFEBERT, and AFL.

Snapshot Memories section with EDIT GROUP, PREVIEW, STORE, RECALL, and VCA GROUP controls. Includes VCA 1-8 control panels with MUTE, SAFEBERT, and AFL.

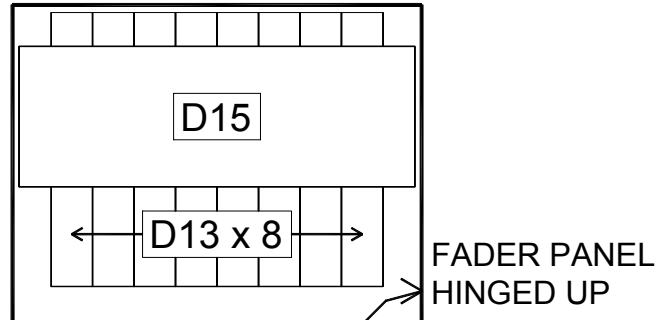


Service Notes:

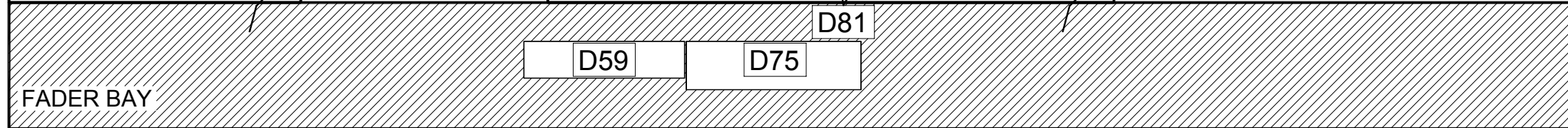
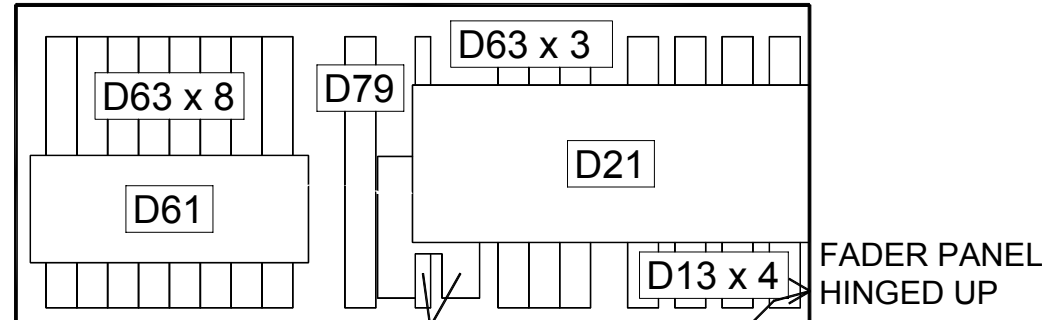
METERPOD INTERNAL VIEW



MONO INPUT FADER INTERNAL VIEW

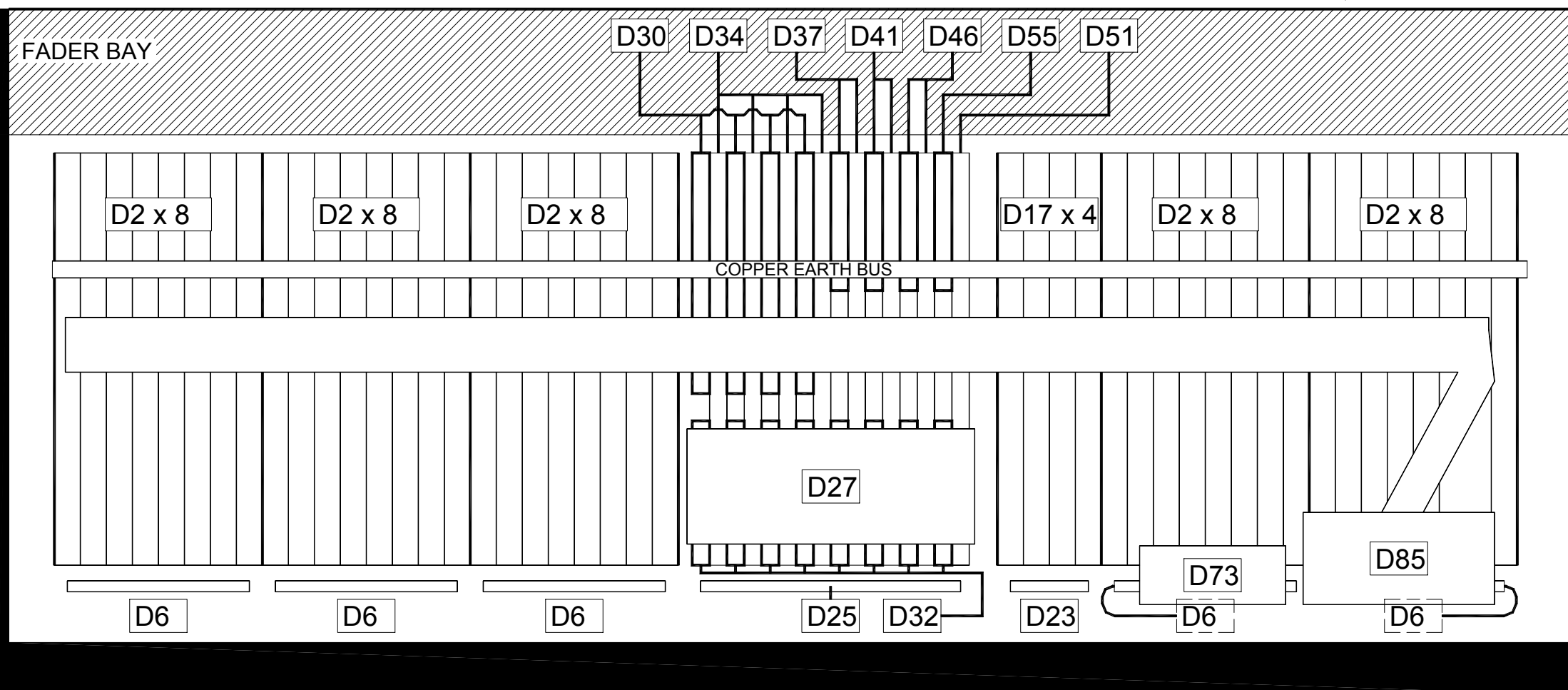


MASTER FADER INTERNAL VIEW



FRONT

BASE REMOVED, MIXER ON ITS BACK



**Drawing Contents**

System Block Diagram ..... D1

Mono Input Channel ..... D2-5

Mono Input Connector ..... D6-7

4M / 4S Connector ..... D8-12

Mono Input Fader ..... D13-14

Mono Input Fader Slave ..... D15-16

Stereo Input Channel ..... D17-20

Stereo Input Fader Slave ..... D21-22

Stereo/LRC Connector ..... D23-24

Master Connector ..... D25-26

Master Distribution ..... D27-29

Group Sub 1 ..... D30-31

Group Sub 2 ..... D32-33

Group 2-8 Master ..... D34-36

Aux 9/10 Master ..... D37-40

Aux 11/12 Master ..... D41-45

Aux 13/14 Master ..... D46-50

Aux 15/16 Master ..... D51-54

LRC Mix Master ..... D55-58

Aux Master Slave ..... D59-60

VCA Master Fader Slave ..... D61-62

Master Fader ..... D63-64

Meter 1-8 / 9-16 ..... D65-67

Meter Master ..... D68-70

Meter LED Bar ..... D71-72

MIDI / Power ..... D73-74

CPU ..... D75-78

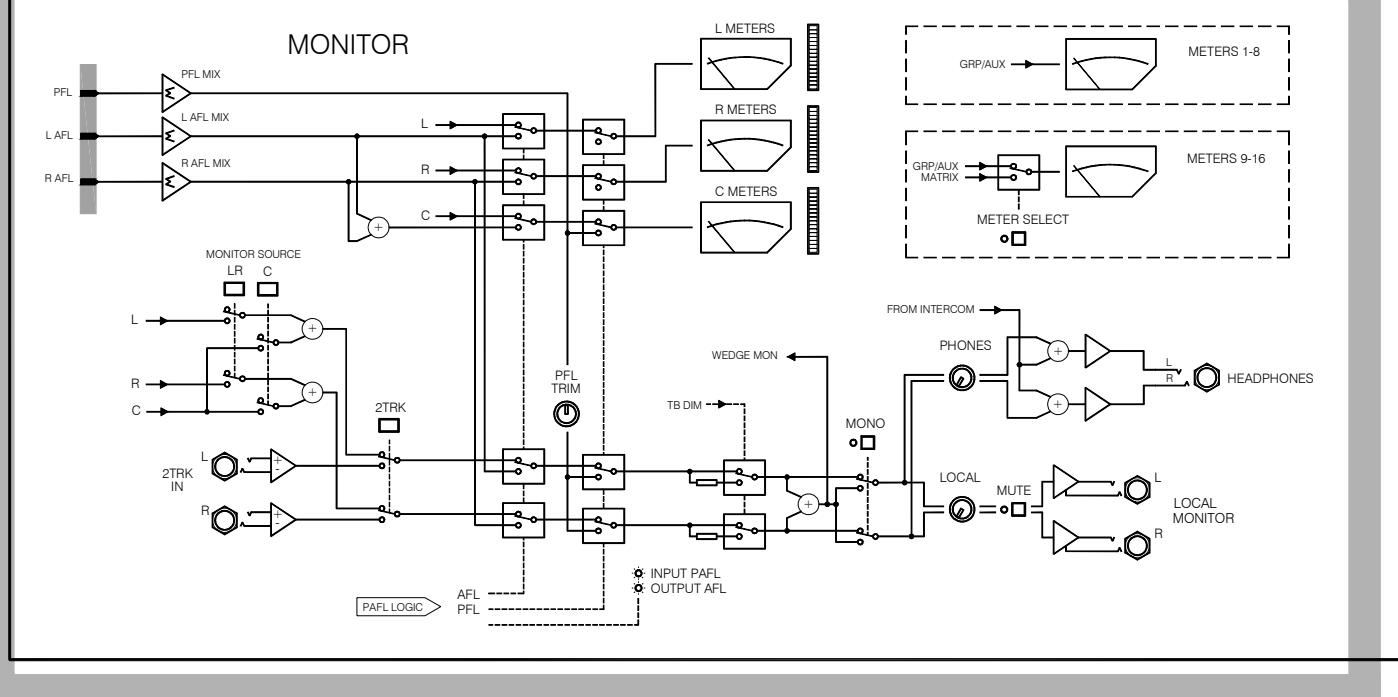
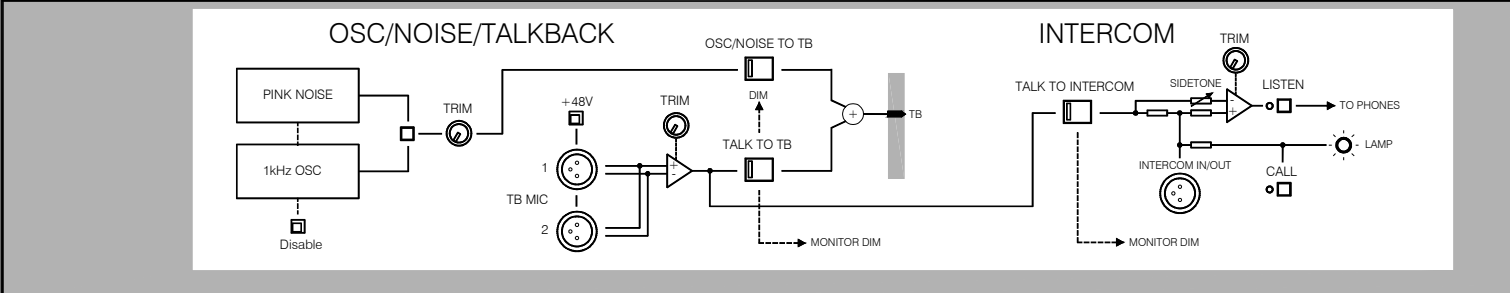
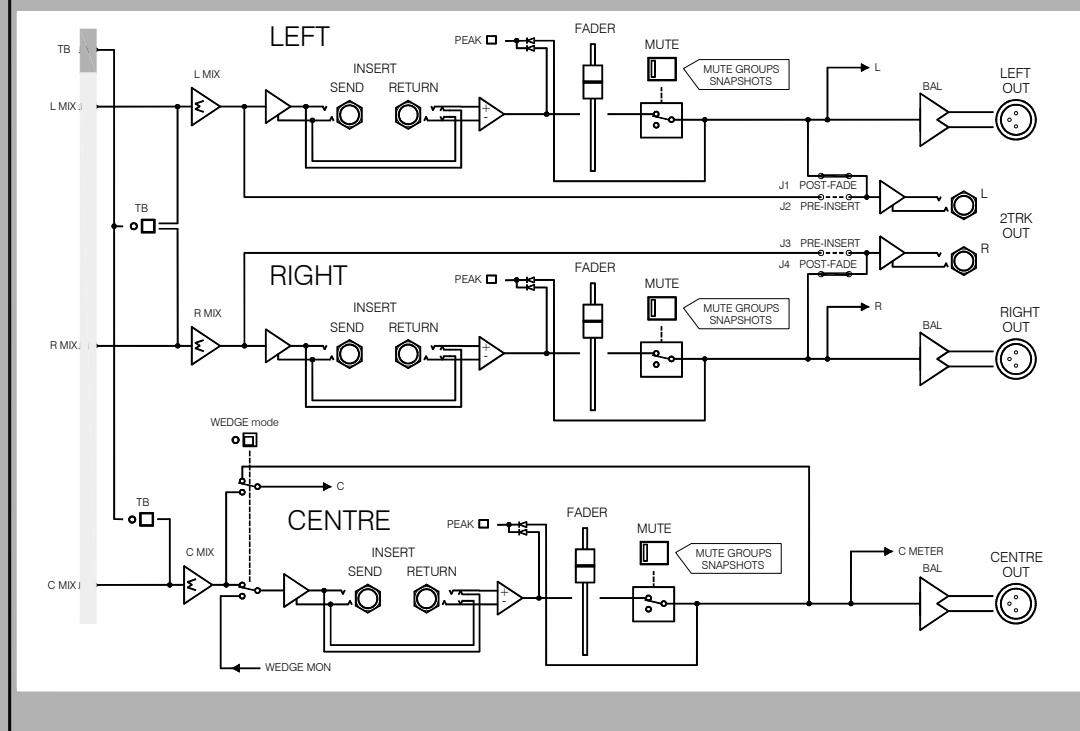
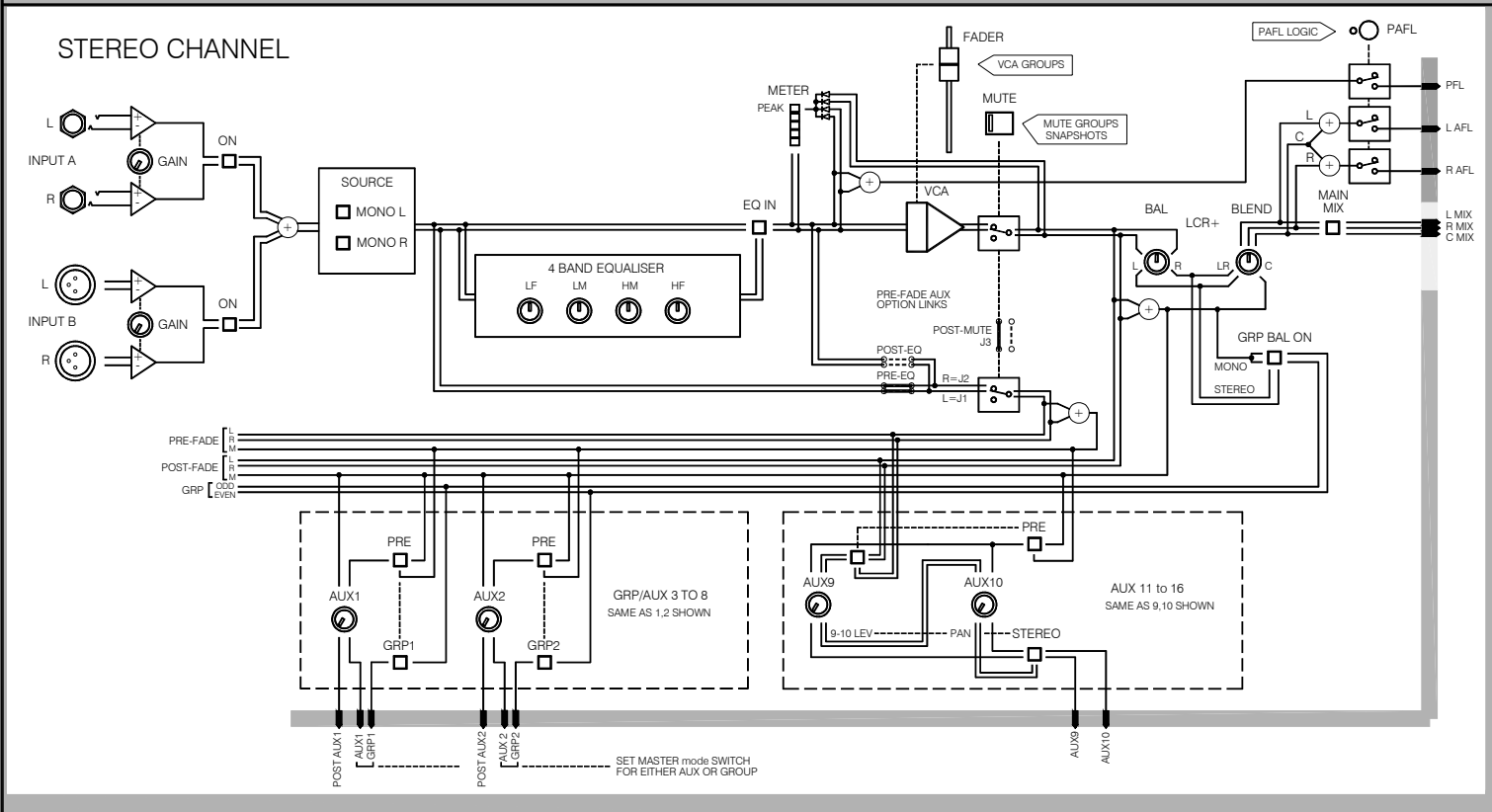
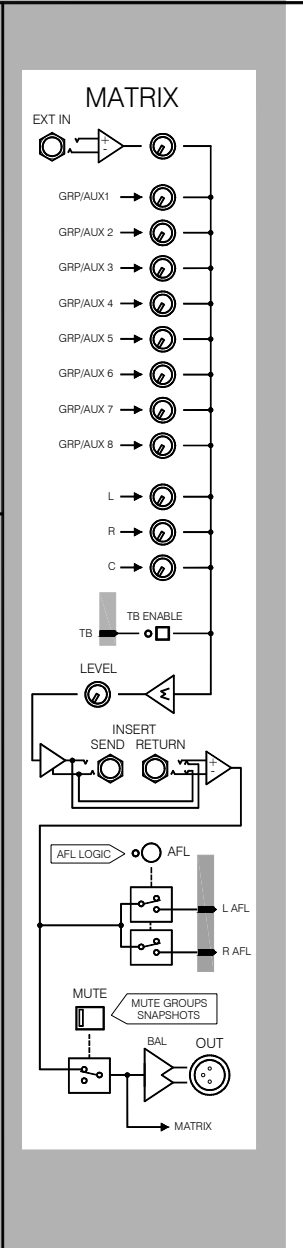
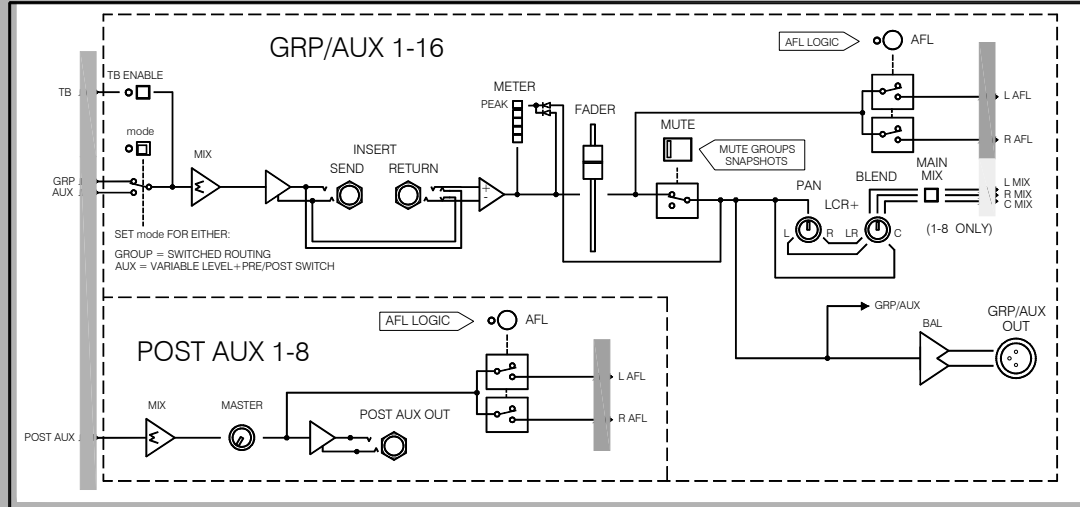
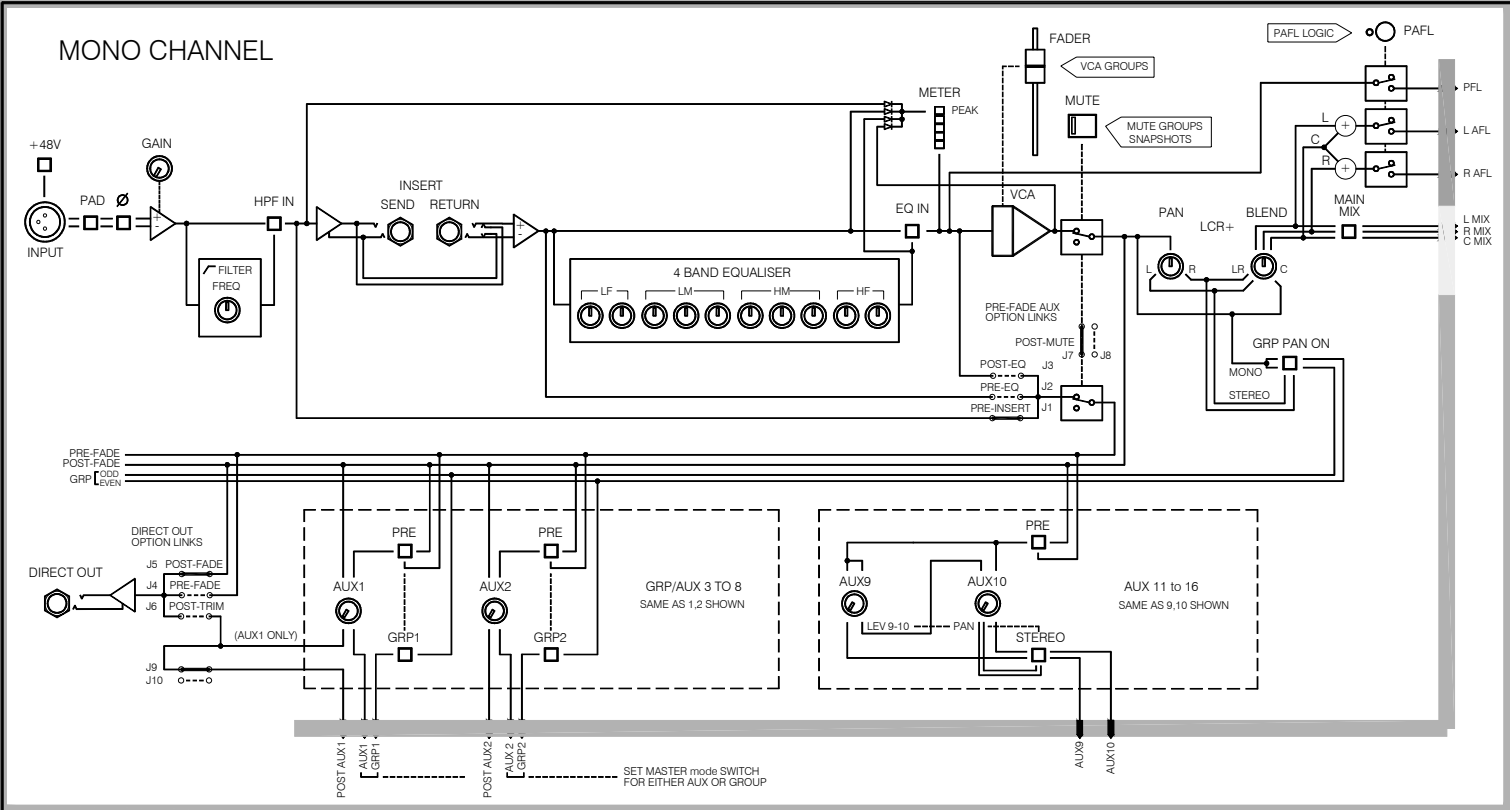
Mute Group ..... D79-80

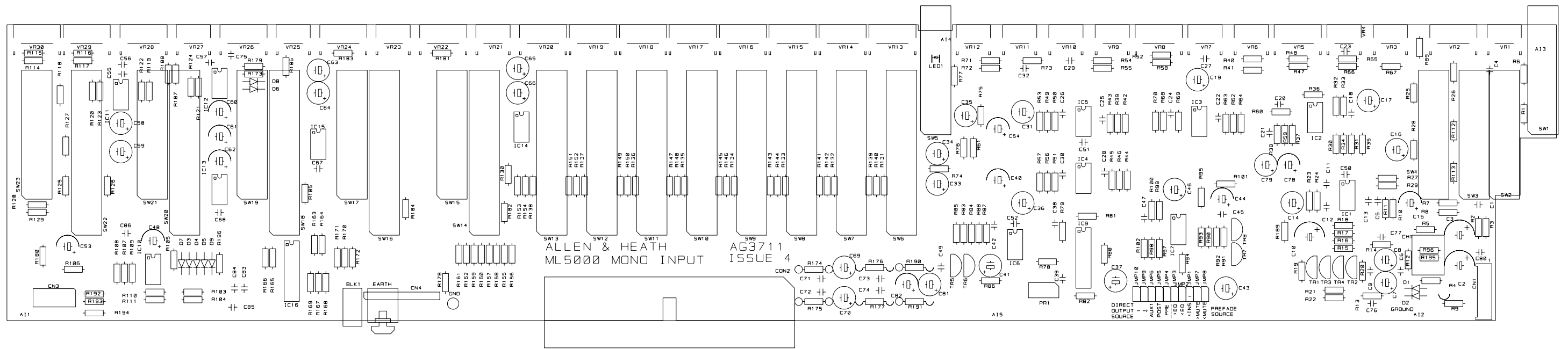
Control Panel ..... D81-82

MPS14 Power Supply ..... D83-84

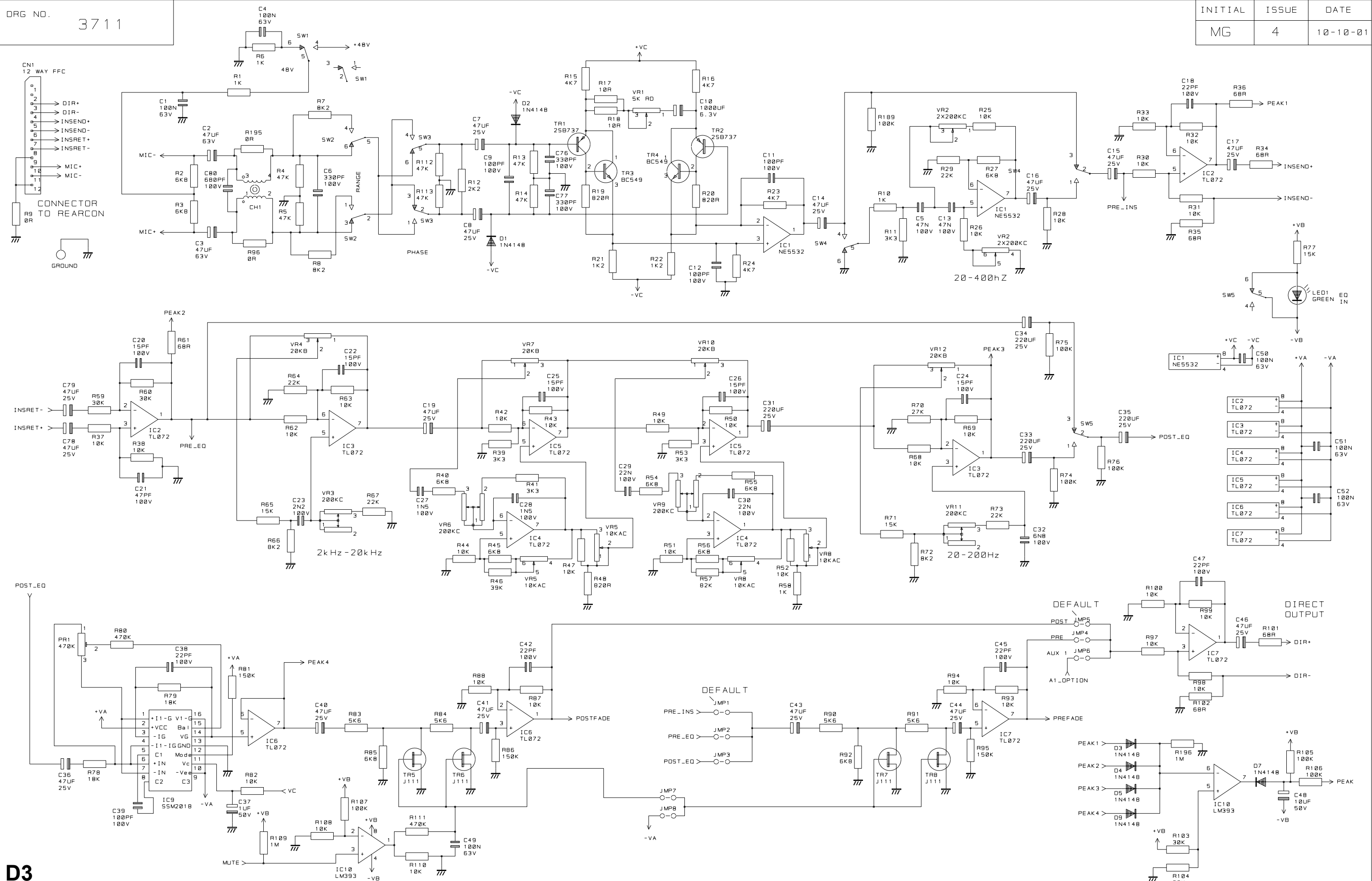
Sys-Link Input ..... D85-86

Sys-Link Output ..... D87-89





INITIAL	ISSUE	DATE
MG	4	10-10-01



**D3**

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 WITHOUT WRITTEN PERMISSION.

- NOTES
- VR1 5K RD
  - VR2 2X200K
  - VR3 200K
  - VR4 10KAC
  - VR5 10KAC
  - VR6 200K
  - VR7 20K
  - VR8 10KAC
  - VR9 200K
  - VR10 20K
  - VR11 200K
  - VR12 20K

POT BRACKETS CONNECTED TO ENFORCE CONNECTION TO FRONT PANEL FOR HUM SHIELDING

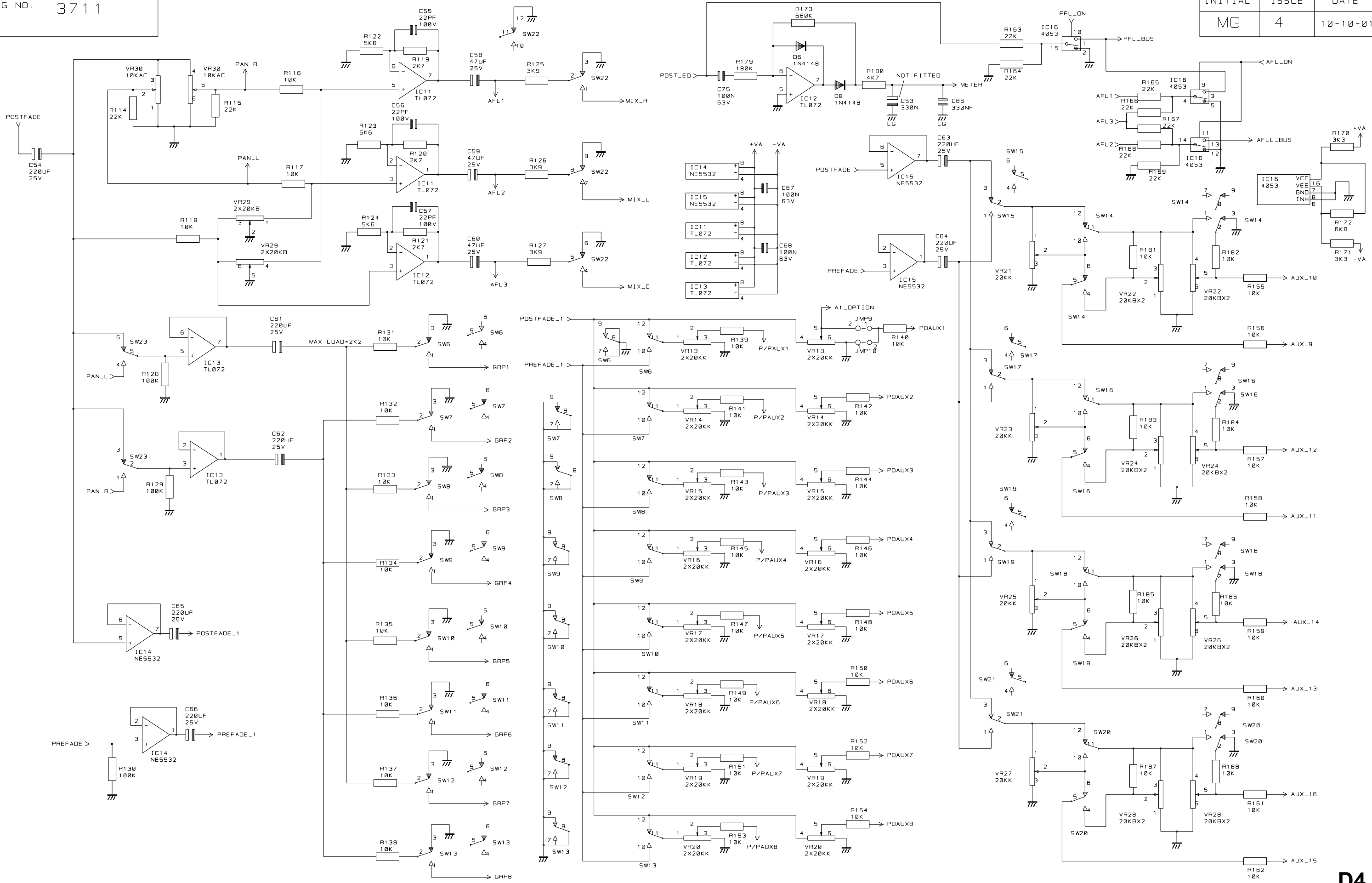
DRN. MG

ALLEN & HEATH  
 KERNICK INDUSTRIAL EST  
 PENRYN  
 CORNWALL  
 TR10 9LU  
 TEL: 01326 372070  
 FAX: 01326 377097

TITLE  
 ML5000 MONO  
 INPUT

DRG NO. 3711

INITIAL	ISSUE	DATE
MG	4	10-10-01



D4

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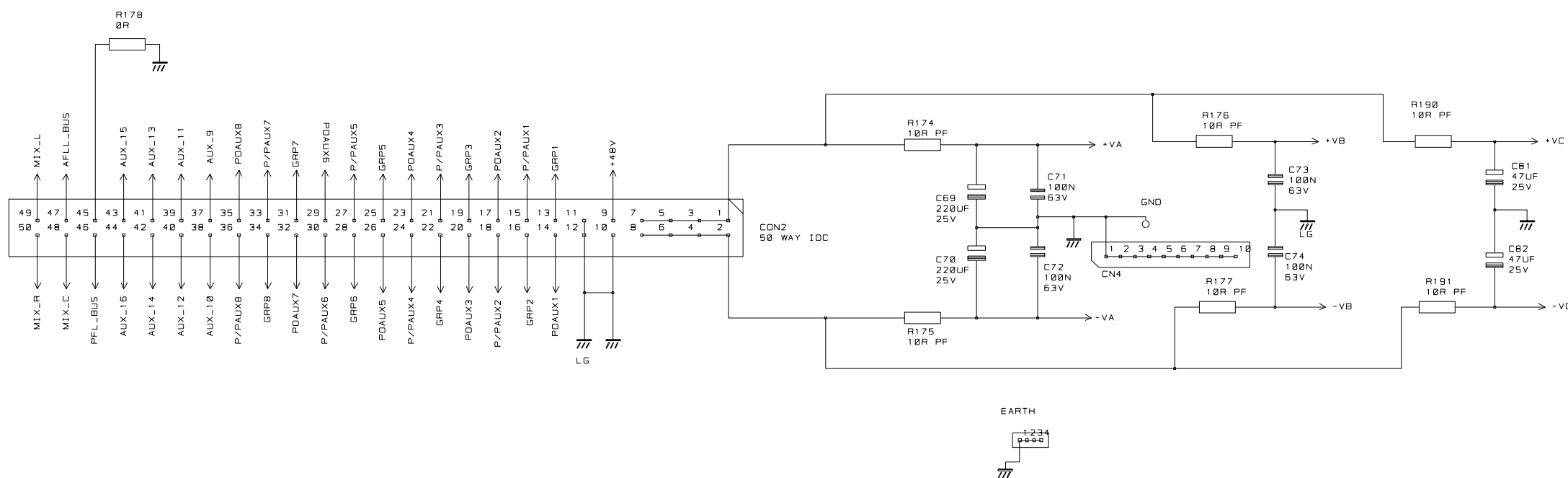
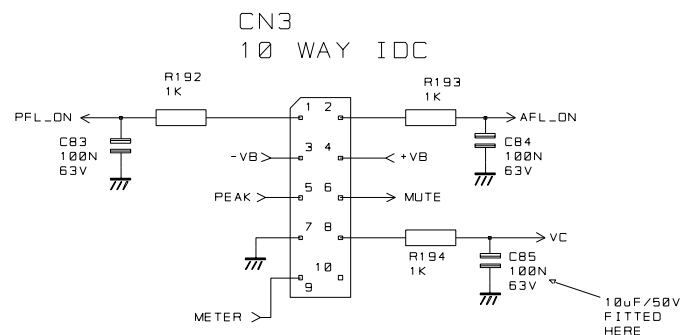
NOTES

VR13	VR14	VR15	VR16	VR17	VR18	VR19	VR20	VR21
VR23	VR25	VR27	VR22	VR24	VR26	VR28	VR29	VR30

DRN. MG

ALLEN & HEATH  
 KERNICK INDUSTRIAL EST  
 PENRYN  
 CORNWALL  
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TITLE  
 ML5000  
 MONO INPUT  
 DRG NO. 3711



**D5**

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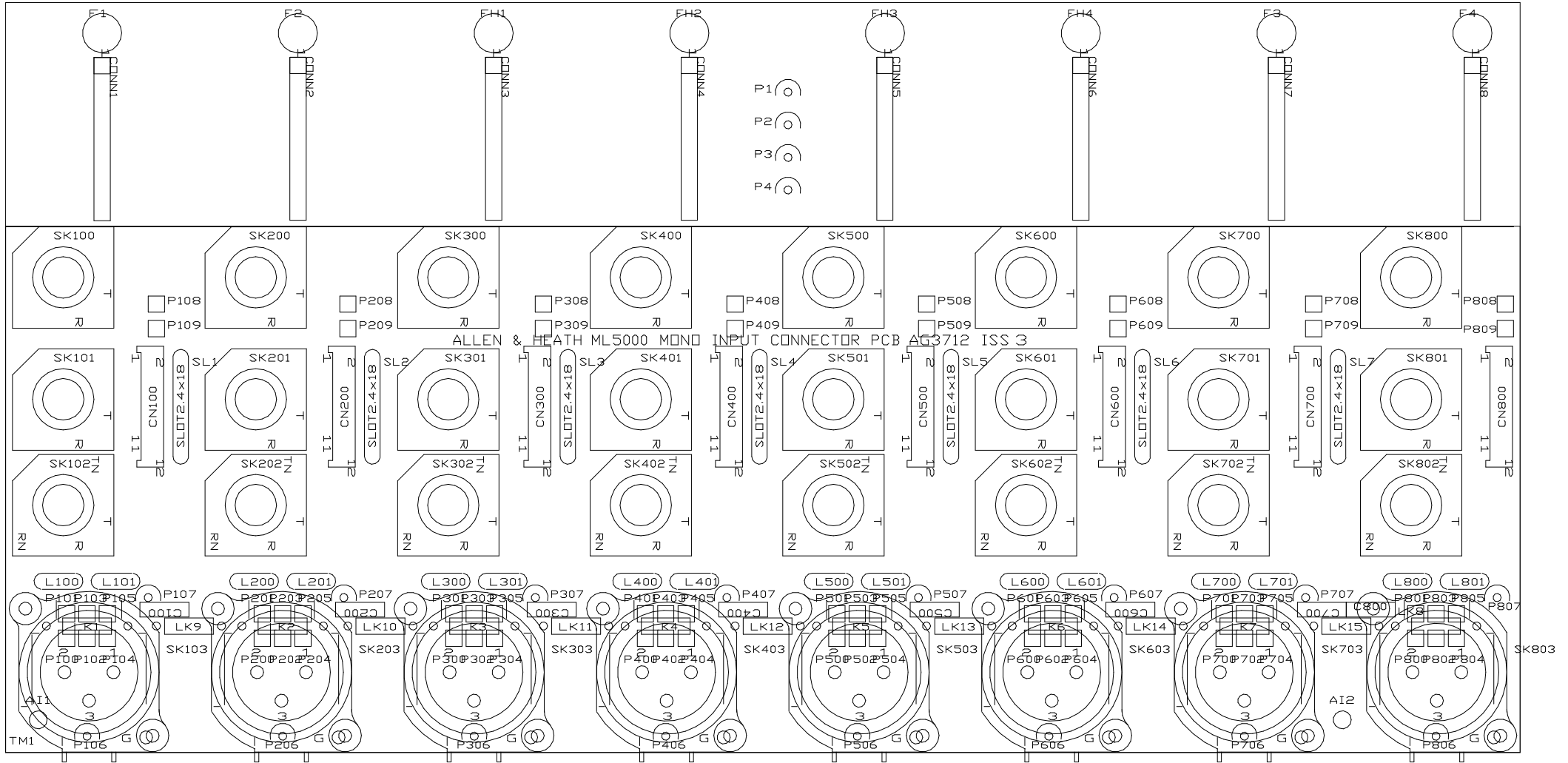
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DRN. MG

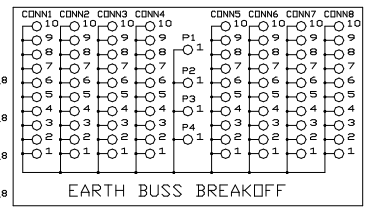
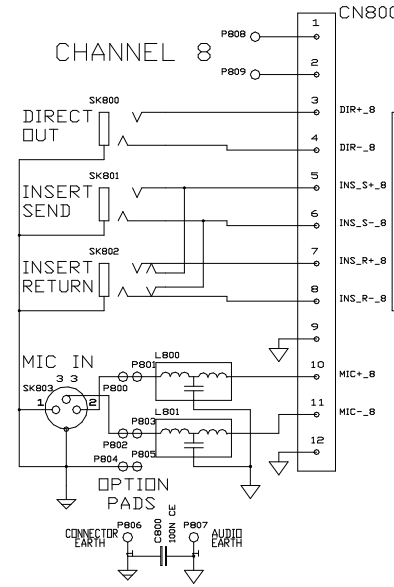
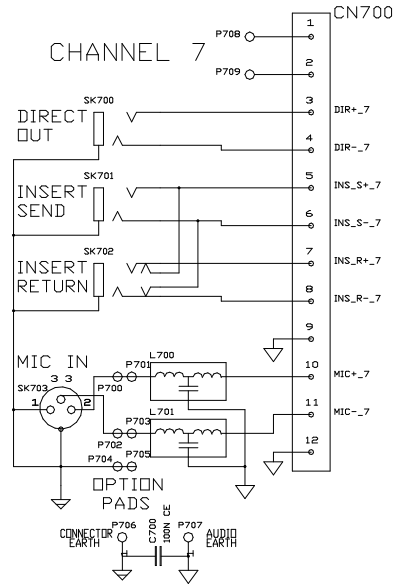
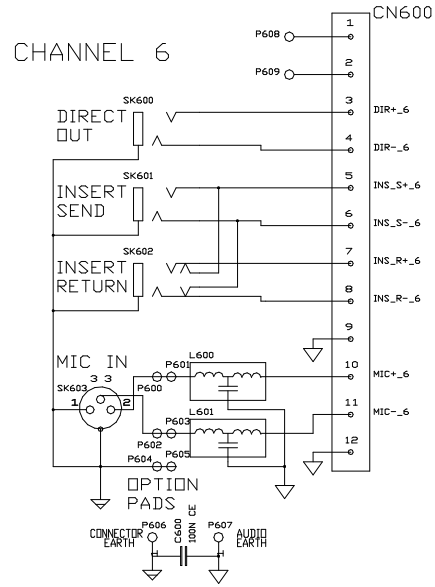
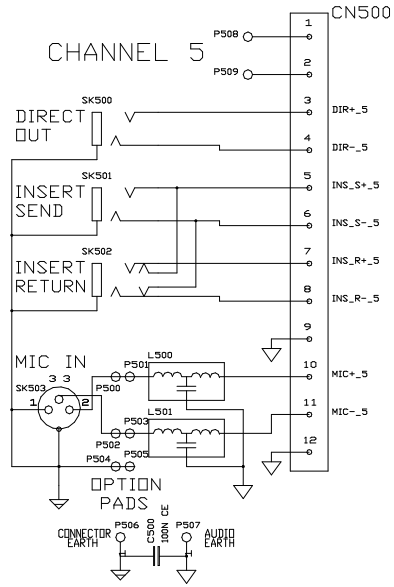
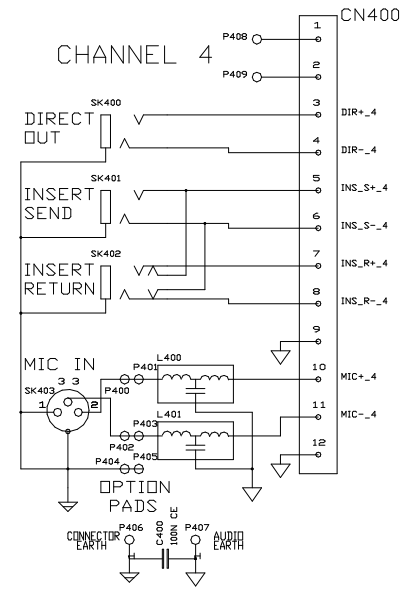
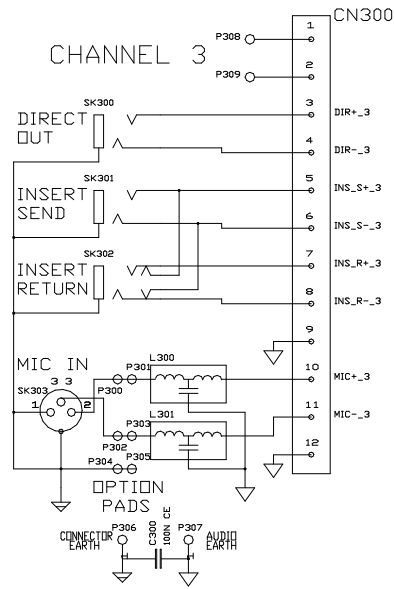
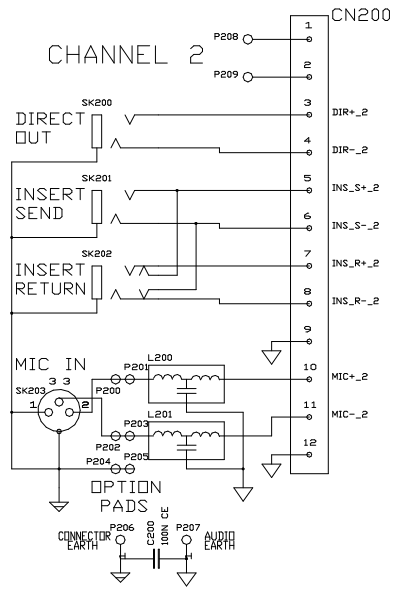
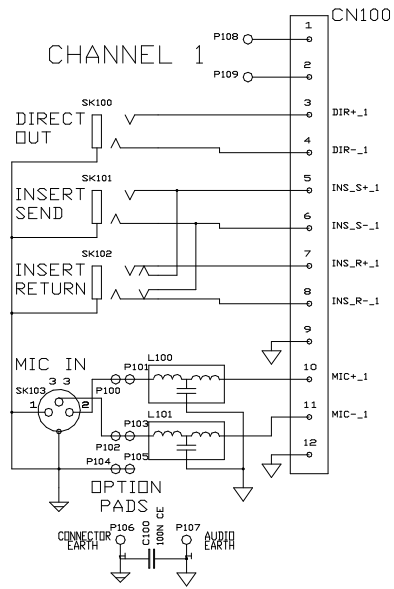
ALLEN & HEATH  
 KERNICK INDUSTRIAL EST  
 PENRYN  
 CORNWALL  
 TR10 9LU  
 TEL: 01326 372070  
 FAX: 01326 377097

TITLE  
 ML5000  
 MONO INPUT

DRG NO.  
 3711







D7

ISS	REVISION	BY	DATE
A	ORIGIN	AAT	05-07-99
1	100N CAPS ADDED	AAT	14-12-99
2	EARTH BUSS ADDED	AAT	10-04-00
3	CLINCH SHORT PREVENTION	AAT	28-06-00

NOTES

1. RESISTORS MARKED \* ARE 1% ALL OTHERS ARE 3% 1/4W UNLESS OTHERWISE MARKED
2. ELECTROLYTIC CAPACITORS ARE ?F/VOLTS

UNIT TITLE  
ML5000

DRAWING TITLE  
MONO INPUT CONNECTOR

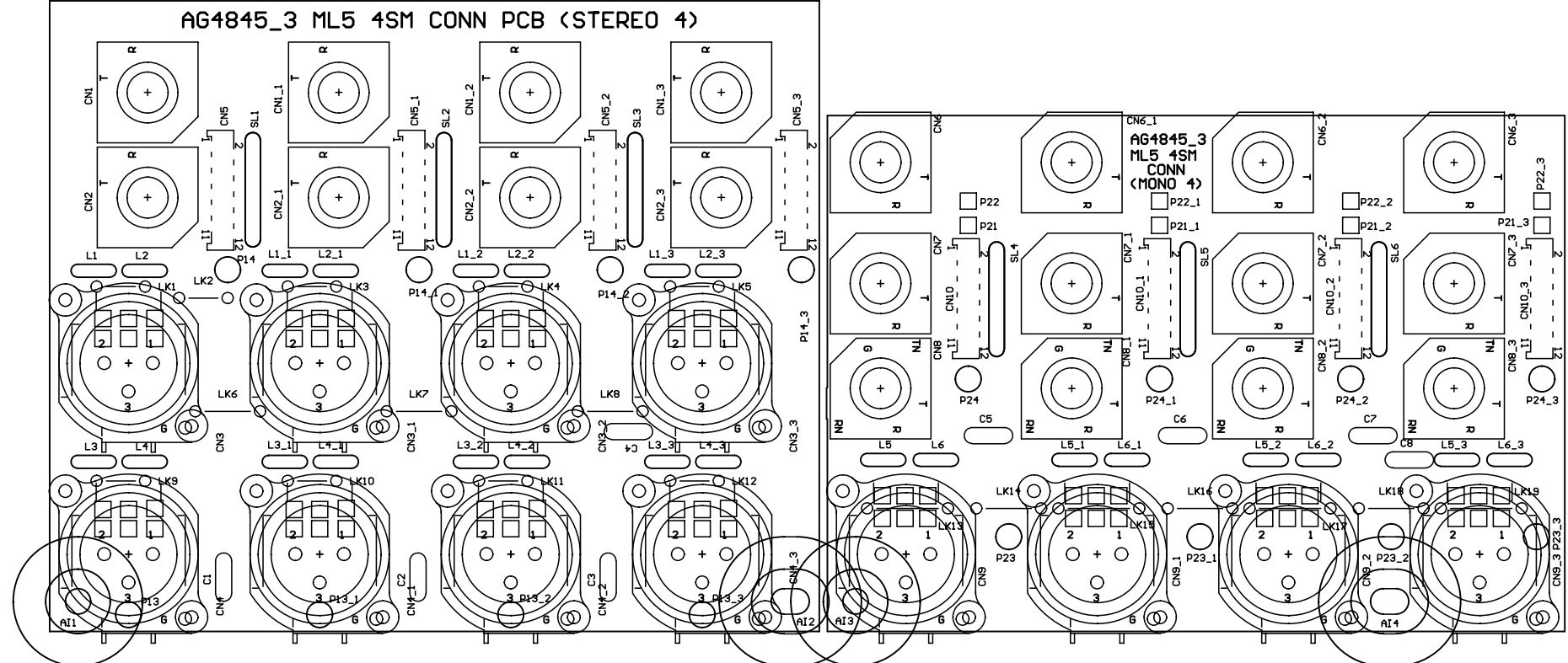
PCB TYPEAG3712

ALLEN & HEATH  
KERNICK INDUSTRIAL ESTATE  
PENRYN  
CORNWALL  
ENGLAND TR10 9LU

TEL. (44) (0) 1326 372070  
FAX. (44) (0) 1326 377097

DRAWING No. C3712 ISSUE 3 A2

a  
b  
c  
d  
e

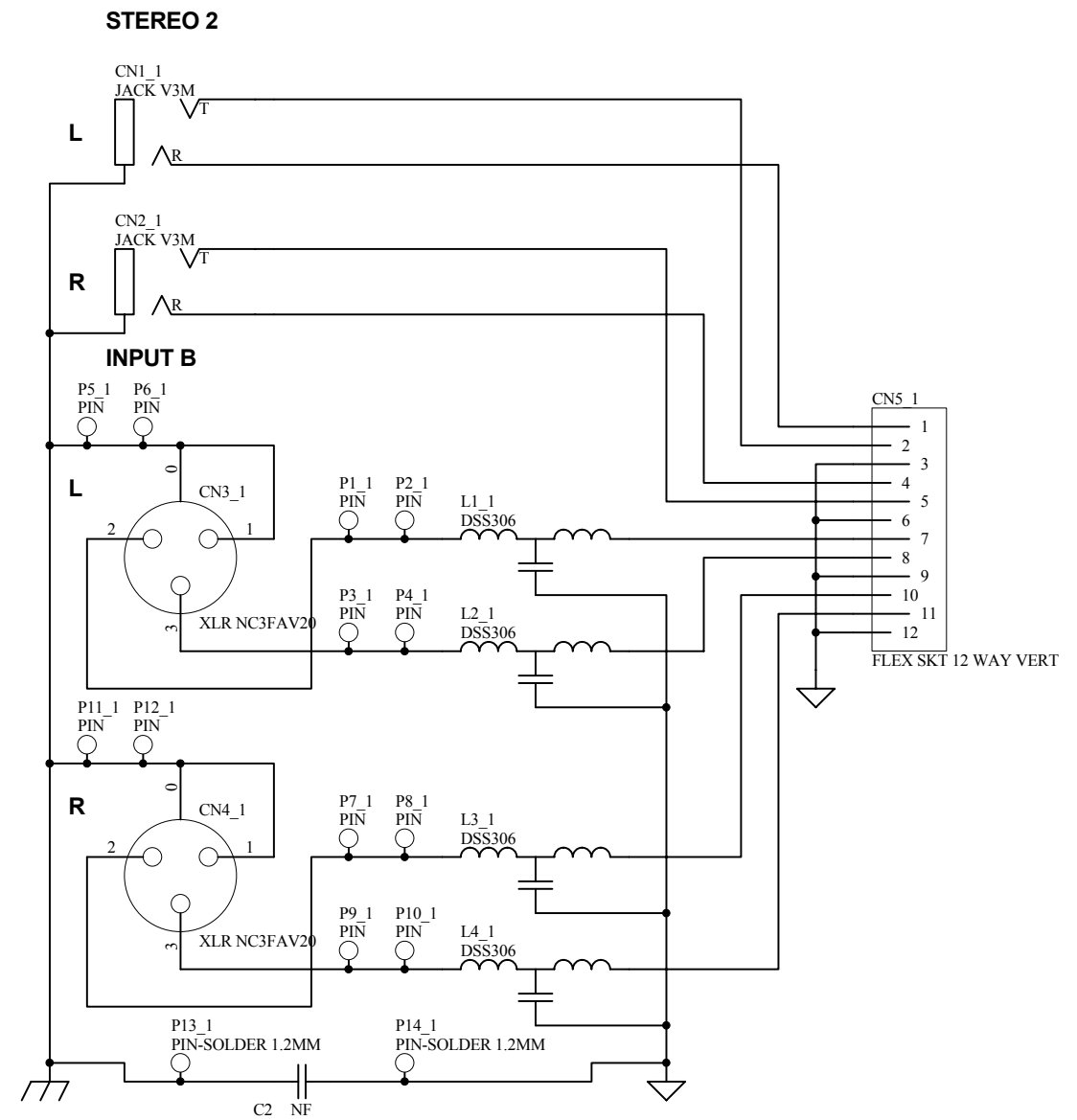
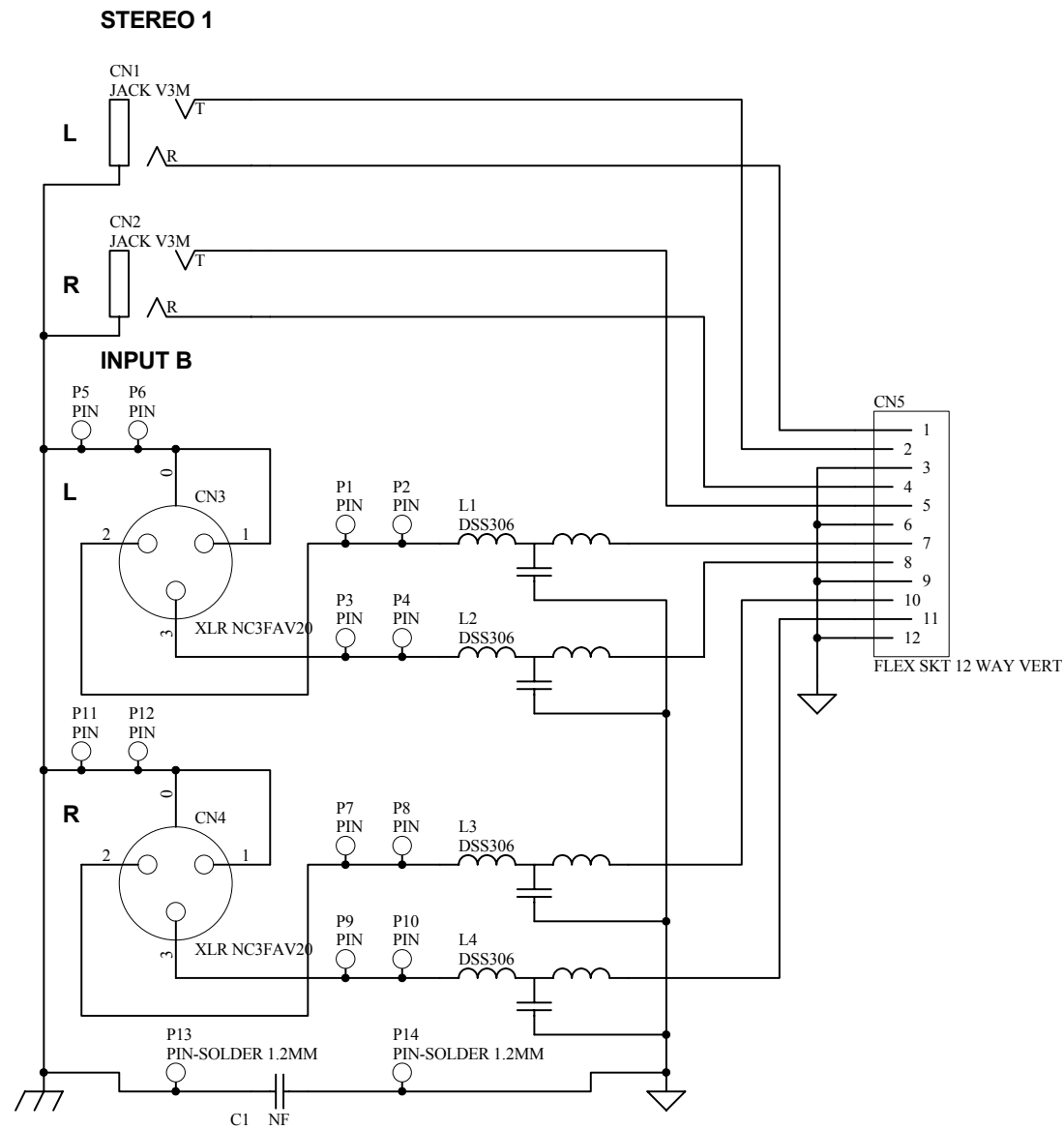


D8

**ALLEN&HEATH**  
 Kernick Industrial Estate,  
 Penryn, Cornwall,  
 England,TR10 9LU  
 Tel: +44 (0)8707 556250  
 Fax: +44 (0)8707 556251

TOP OVERLAY .GTO  
 FILE: AG4845\_3.PCB PRINTED: 10:31:44 3-Dec-2002

TITLE: ML5000 4SM CONN PCB  
 DRG No: AG4845 ISSUE: 3



D9

**ALLEN&HEATH**

Kernick Industrial Estate,  
Penryn, Cornwall,  
England. TR10 9LU  
Tel: +44 (0)8707 556250  
Fax: +44 (0)8707 556251

ISSUE	BY	DATE
2	AAT	18-04-02
3	AAT	02-05-02

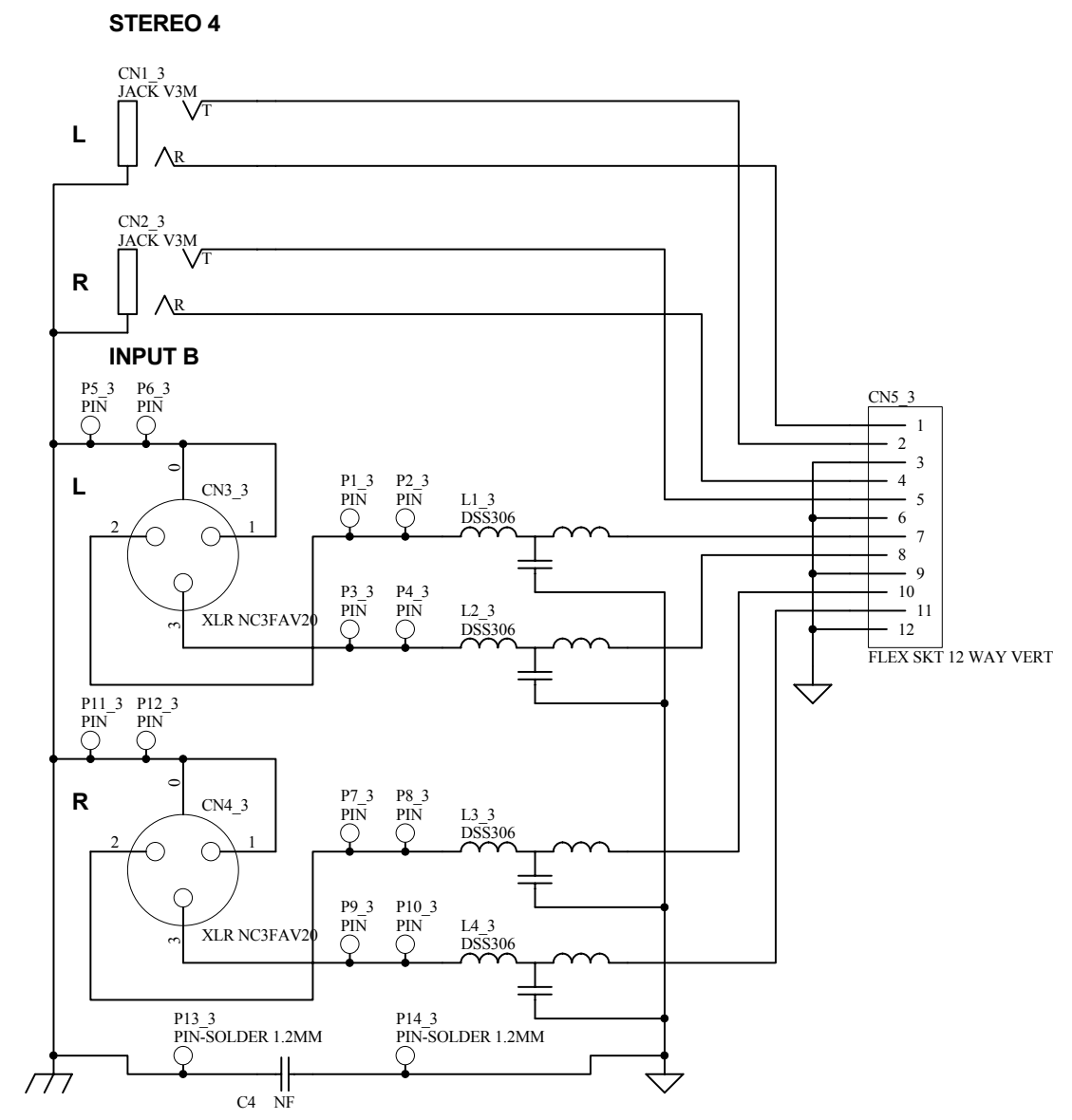
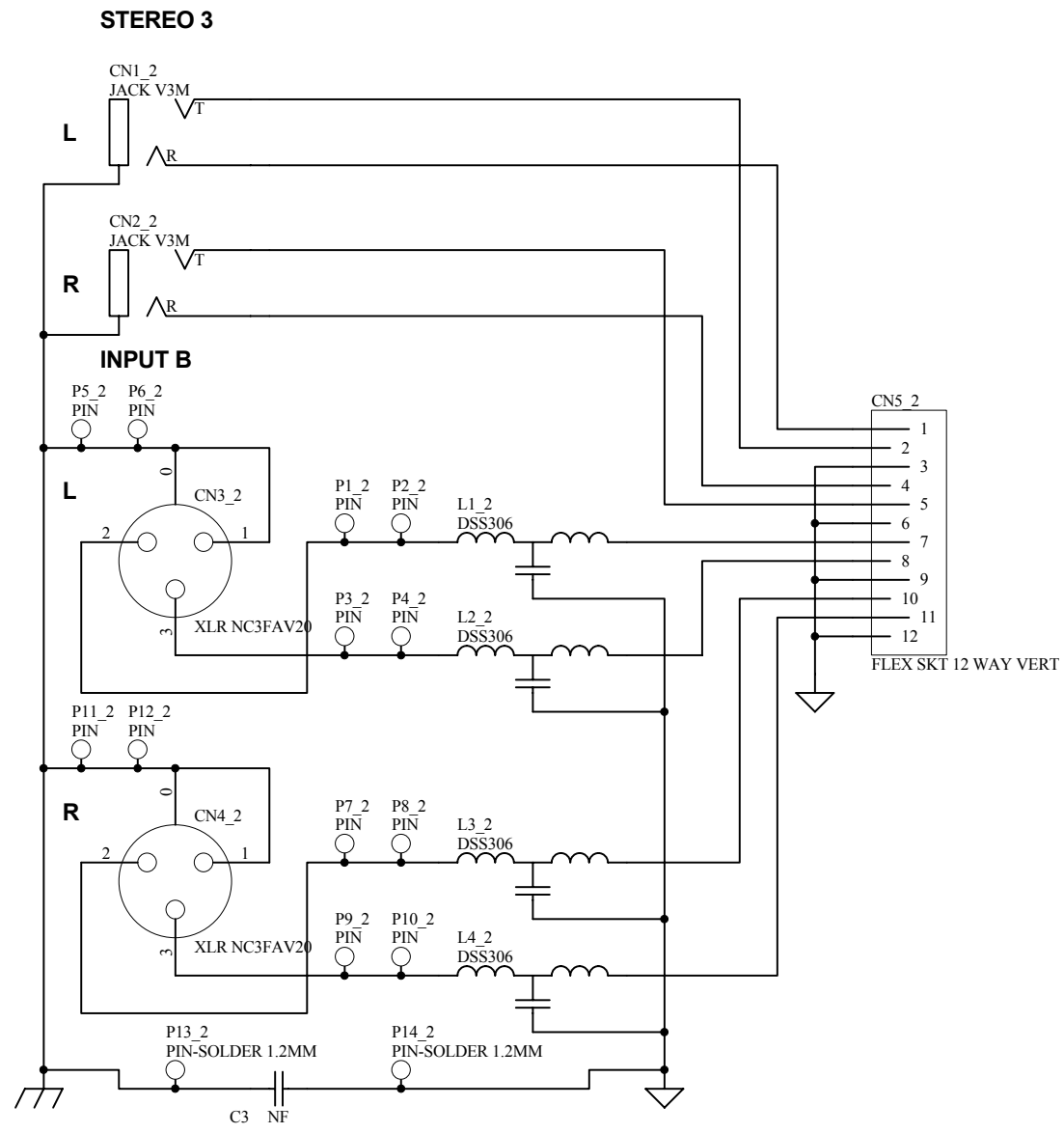
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TITLE: ML5000 4SM CONN PCB

PAGE:

DRG No: C4845 ISSUE: 3 SHEET: 2 OF 5

A B C D E F G H



**D10**

**ALLEN&HEATH**  
 Kernick Industrial Estate,  
 Penryn, Cornwall,  
 England. TR10 9LU  
 Tel: +44 (0)8707 556250  
 Fax: +44 (0)8707 556251

ISSUE	BY	DATE
2	AAT	18-04-02
3	AAT	02-05-02

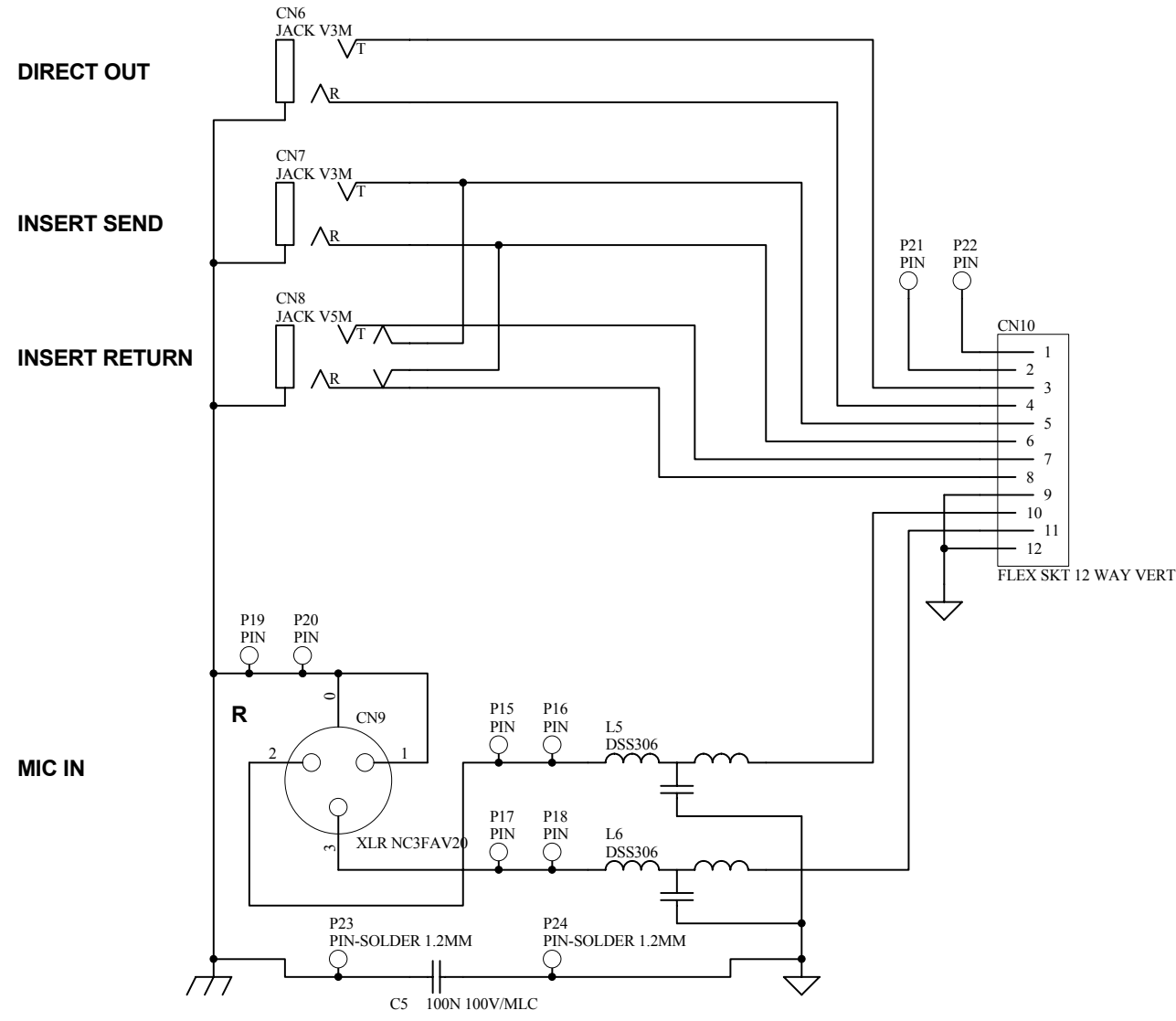
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TITLE: ML5000 4SM CONN PCB  
 PAGE:

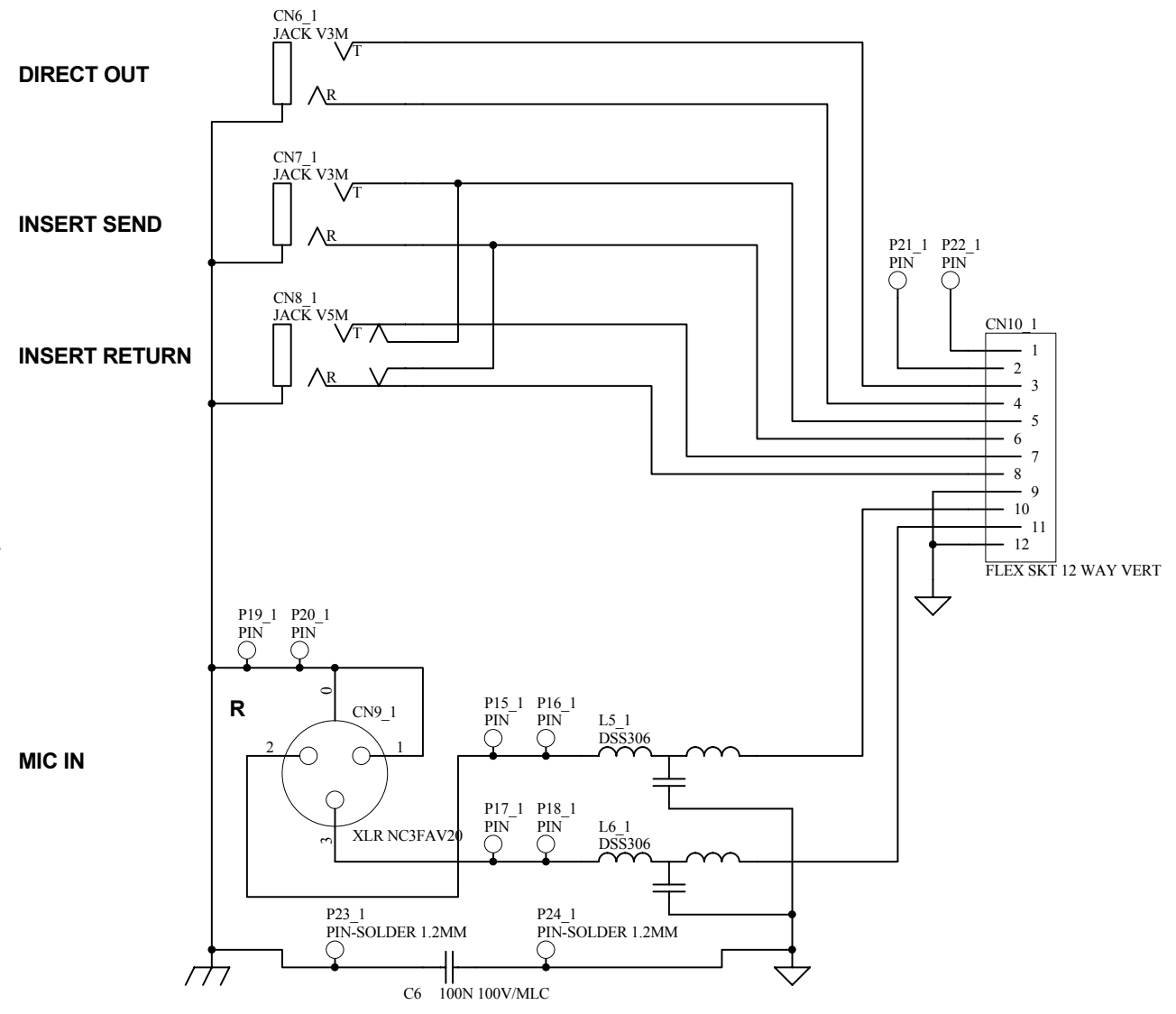
DRG No: C4845 ISSUE: 3 SHEET: 3 OF 5

A B C D E F G H

**MONO 1**



**MONO 2**



**D11**

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 Penryn, Cornwall,  
 England. TR10 9LU  
 Tel: +44 (0)8707 556250  
 Fax: +44 (0)8707 556251

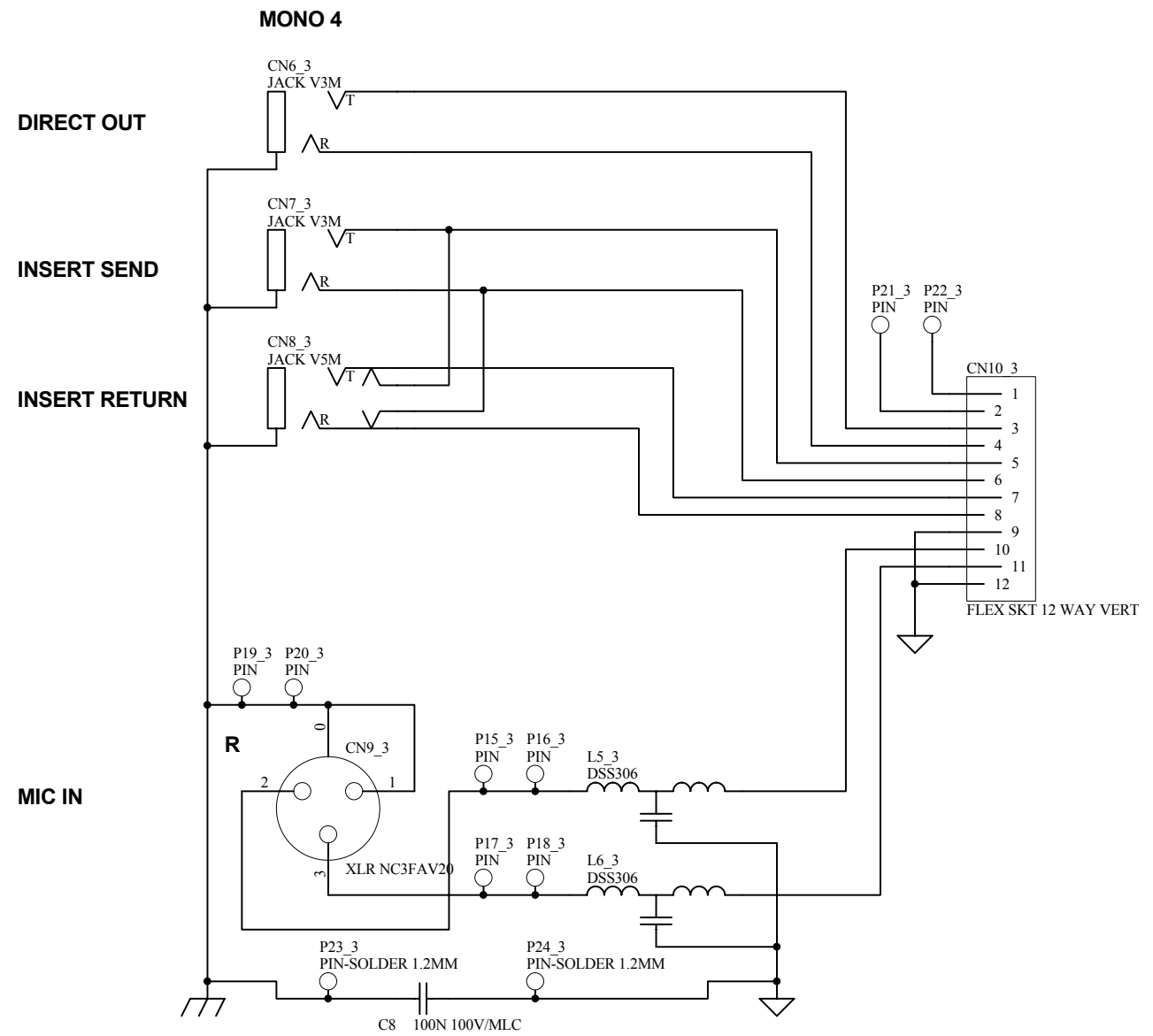
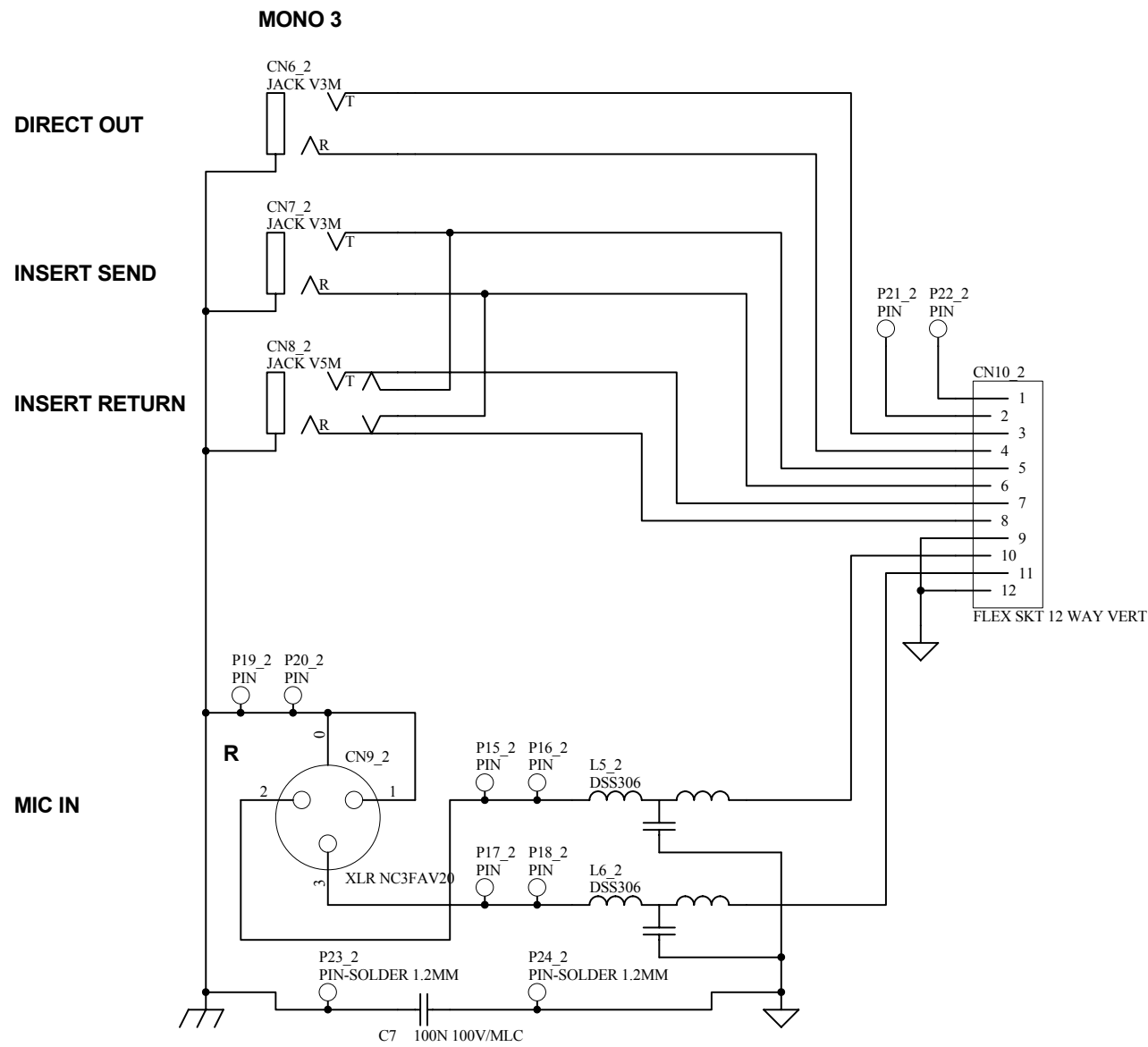
ISSUE	BY	DATE
2	AAT	18-04-02
3	AAT	02-05-02

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TITLE: **ML5000 4SM CONN PCB**  
 PAGE:

DRG No: **C4845** ISSUE: **3** SHEET: **4 OF 5**

A B C D E F G H



**D12**

**ALLEN&HEATH**

Kernick Industrial Estate,  
Penryn, Cornwall,  
England. TR10 9LU  
Tel: +44 (0)8707 556250  
Fax: +44 (0)8707 556251

ISSUE	BY	DATE
2	AAT	18-04-02
3	AAT	02-05-02

FILE: C4845\_3P5.Sch

PRINTED: 10:38:57 3-Dec-2002

TITLE: ML5000 4SM CONN PCB

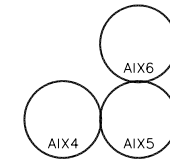
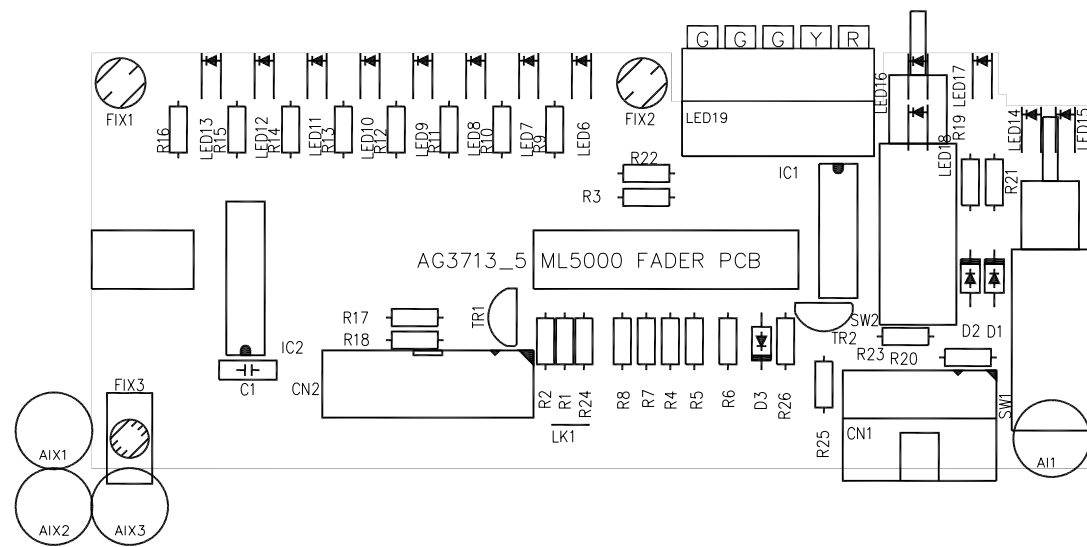
PAGE:

DRG No: C4845 ISSUE: 3 SHEET: 5 OF 5

A B C D E F G H



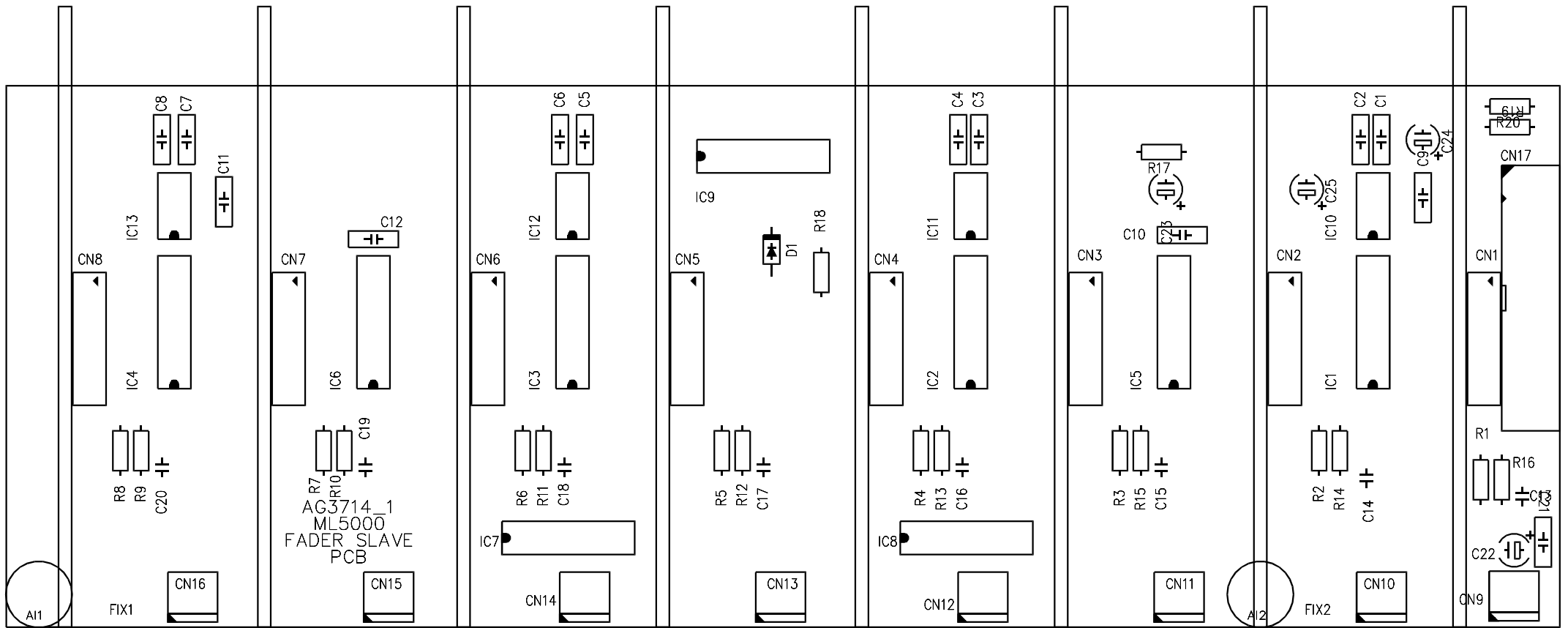
# ALLEN & HEATH ML5000 FADER PCB AG3713\_5

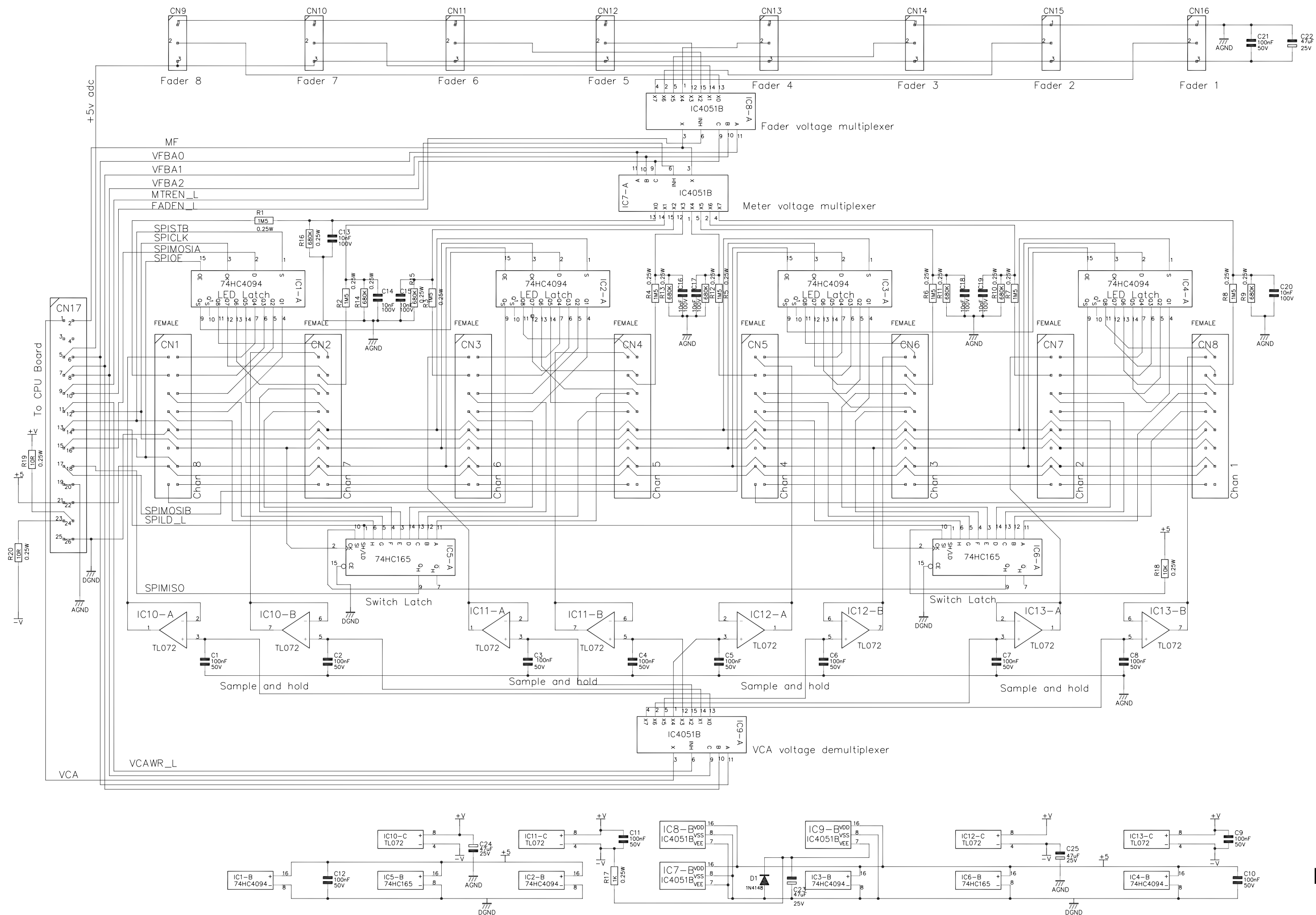


AG3713 ISS 5 TOP SILK 11-11-00



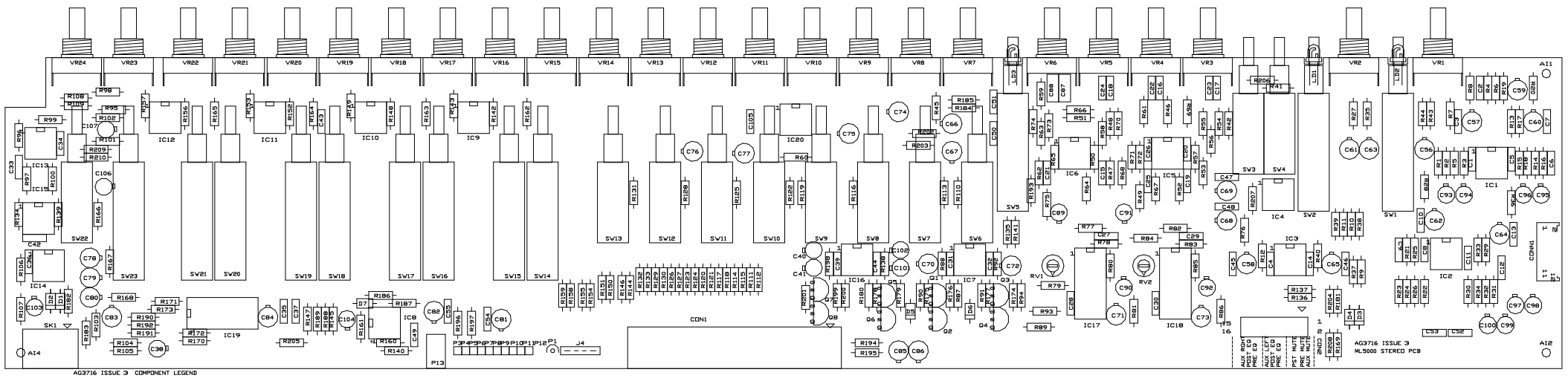


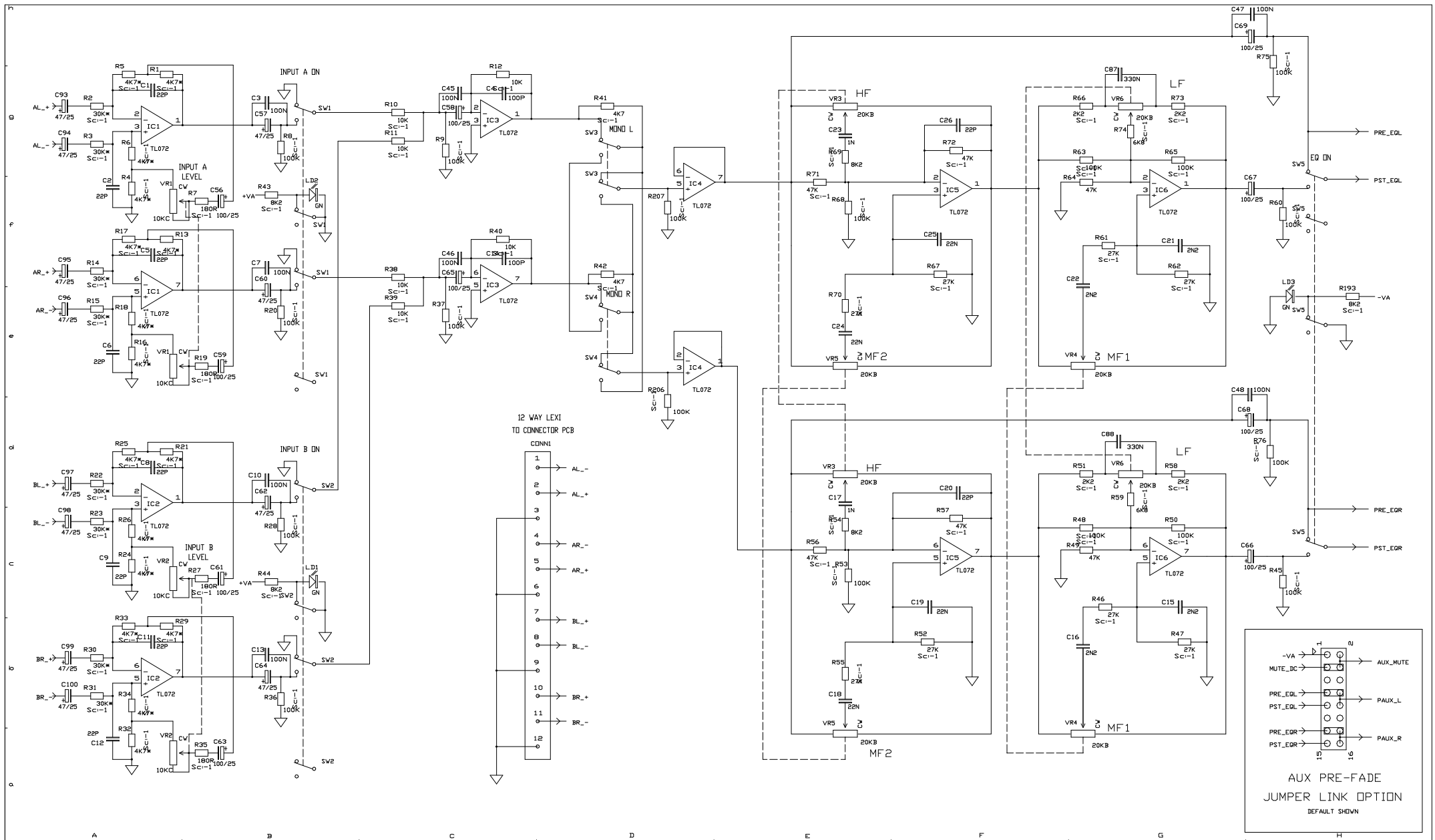




**D16**

ISS A 1 1.1	REVISION ORIGIN Serial data flow changes GROUND PLANE ADDED C1-8 Change to 100N MLC	BY DATE AMR 28-07-99 AAT 02-12-99 AAT 25-07-00	NOTES 1. RESISTORS MARKED * ARE 1% 2. ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED 3. ELECTROLYTIC CAPACITORS ARE uF/VOLTS	UNIT TITLE ML5000	DRAWING TITLE Channel Fader Slave Card CIRCUIT DIAGRAM PCB AG3714	ALLEN & HEATH PENRYN, CORNWALL ENGLAND, TR10 9LU	DRAWING No C3714 SHT 1 of 1	ISSUE 1.1	A1
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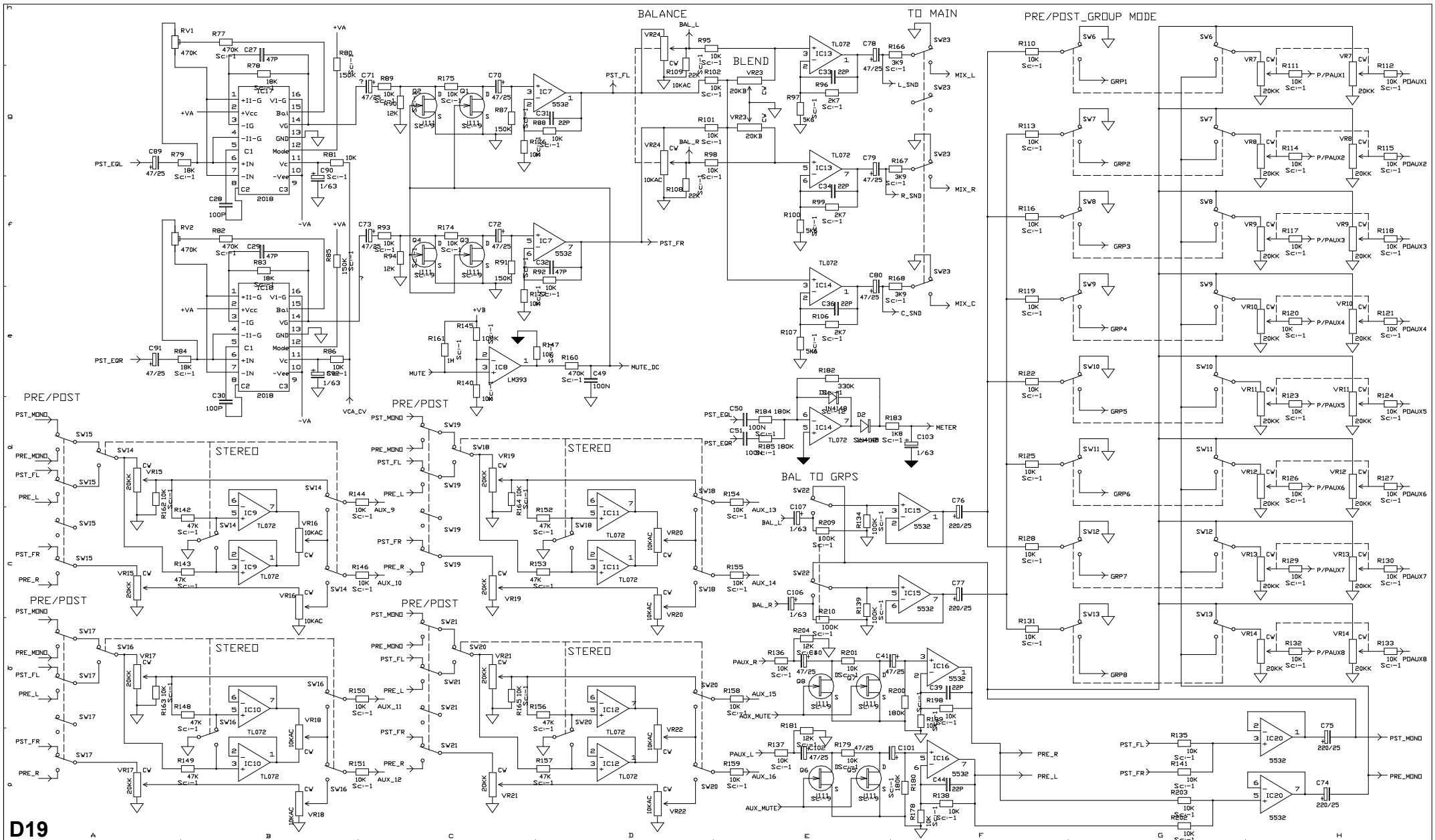




ISS.	REVISION	BY	DATE	NOTES
3	PFL UPDATE/DECOUPLING	ARJ	23-5-00	1. RESISTORS MARKED * ARE 1% ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE MARKED 2. ELECTROLYTIC CAPACITORS ARE 10V/VOLTS

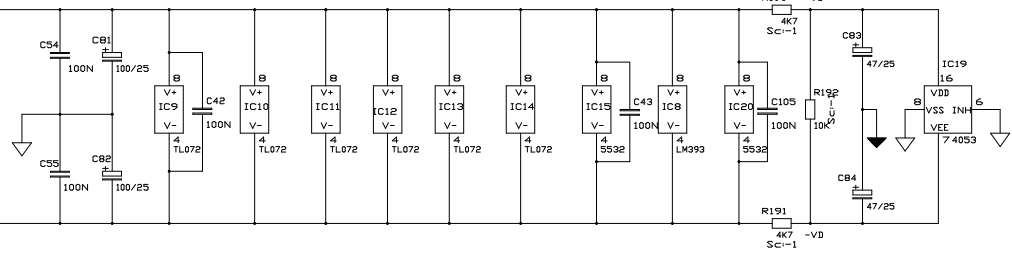
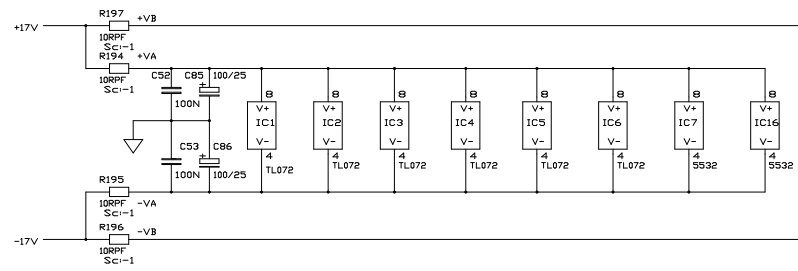
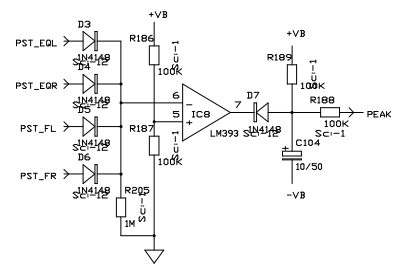
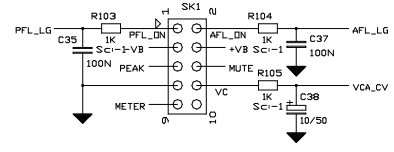
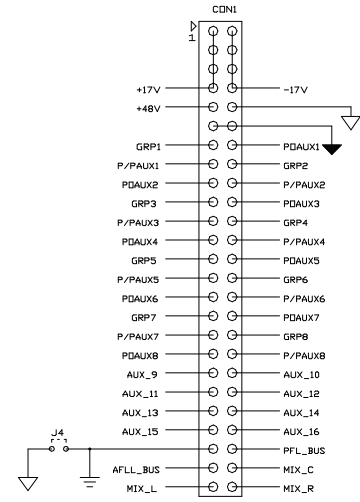
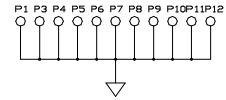
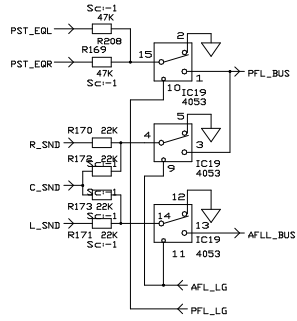
UNIT TITLE	ML5000	
DRAWING TITLE	STEREO PCB	
	PCBAG3716	

MANUFACTURED IN ENGLAND BY			<b>D18</b>
ALLEN & HEATH			
DRAWING No.	C3716	ISSUE	3
			A2

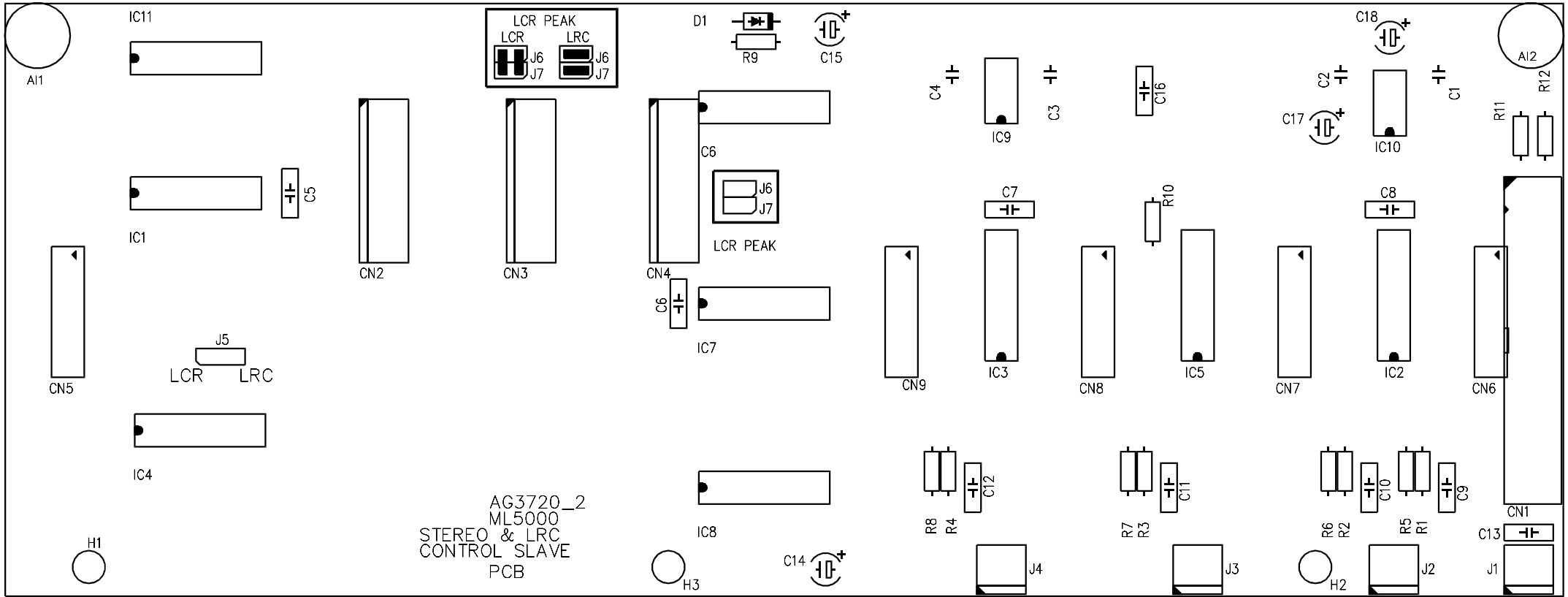


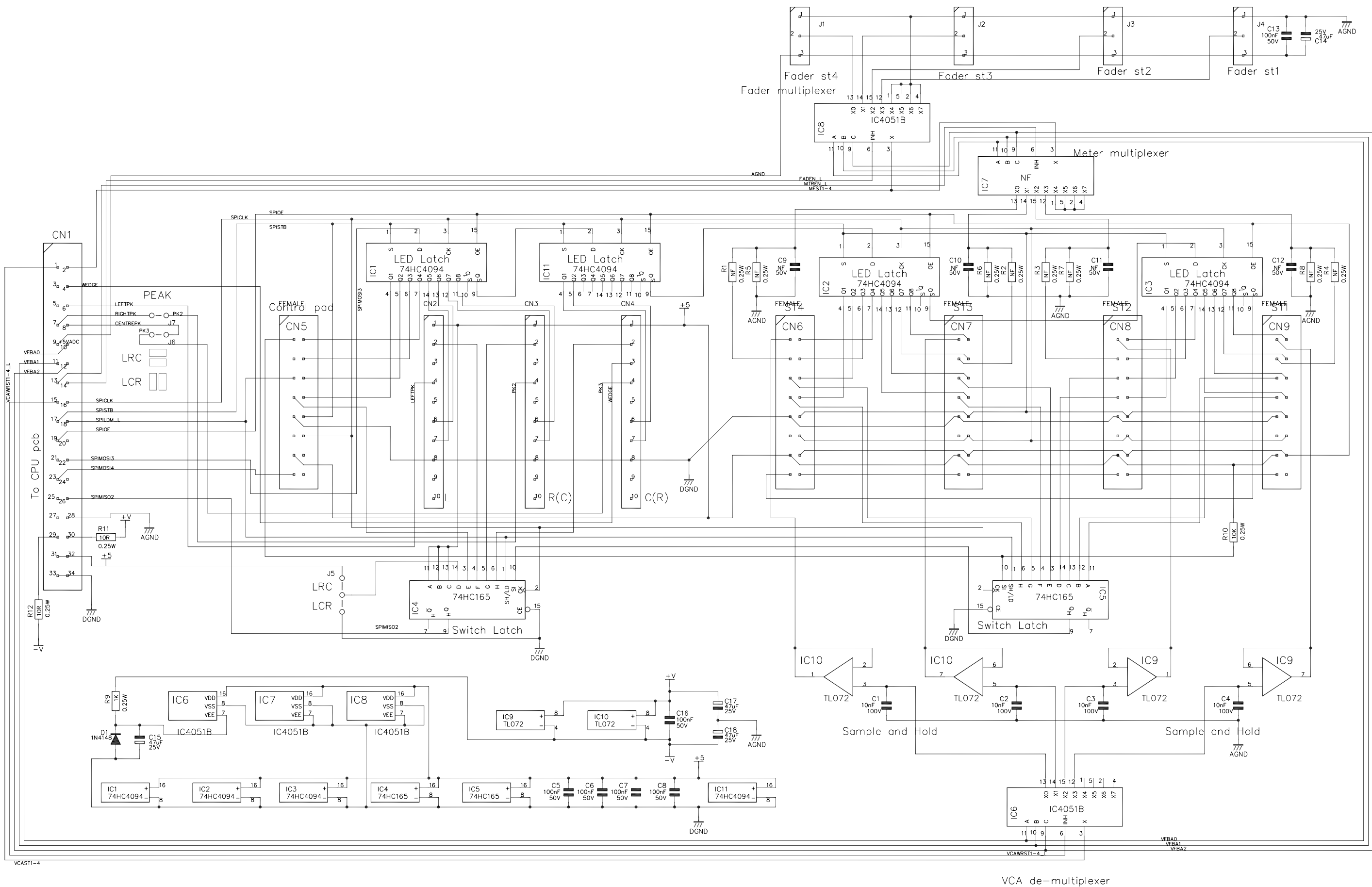
**D19**

ISS.	REVISION	BY DATE	NOTES	UNIT TITLE	MANUFACTURED IN ENGLAND BY
3	PFL UPDATE/DECOUPLING	ORJ 23-5-00	1. RESISTORS MARKED * ARE 1% ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE MARKED 2. ELECTROLYTIC CAPACITORS ARE 10V/VOLTS	ML5000 STEREO PCB	ALLEN & HEATH
				PCBAG3716	DRAWING No. C3716 ISSUE 3 A2



ISS.	REVISION	BY DATE	NOTES	UNIT TITLE	MANUFACTURED IN ENGLAND BY
3	PFL UPDATE/DECOUPLING	RJ 23-5-00	1. RESISTORS MARKED * ARE 1% ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE MARKED 2. ELECTROLYTIC CAPACITORS ARE 16V/VOLTS	ML5000	ALLEN & HEATH
				STEREO PCB	D20
				PCBAG3716	DRAWING No. C3716 ISSUE 3 A2





VCAWST1-4\_L

VCA de-multiplexer

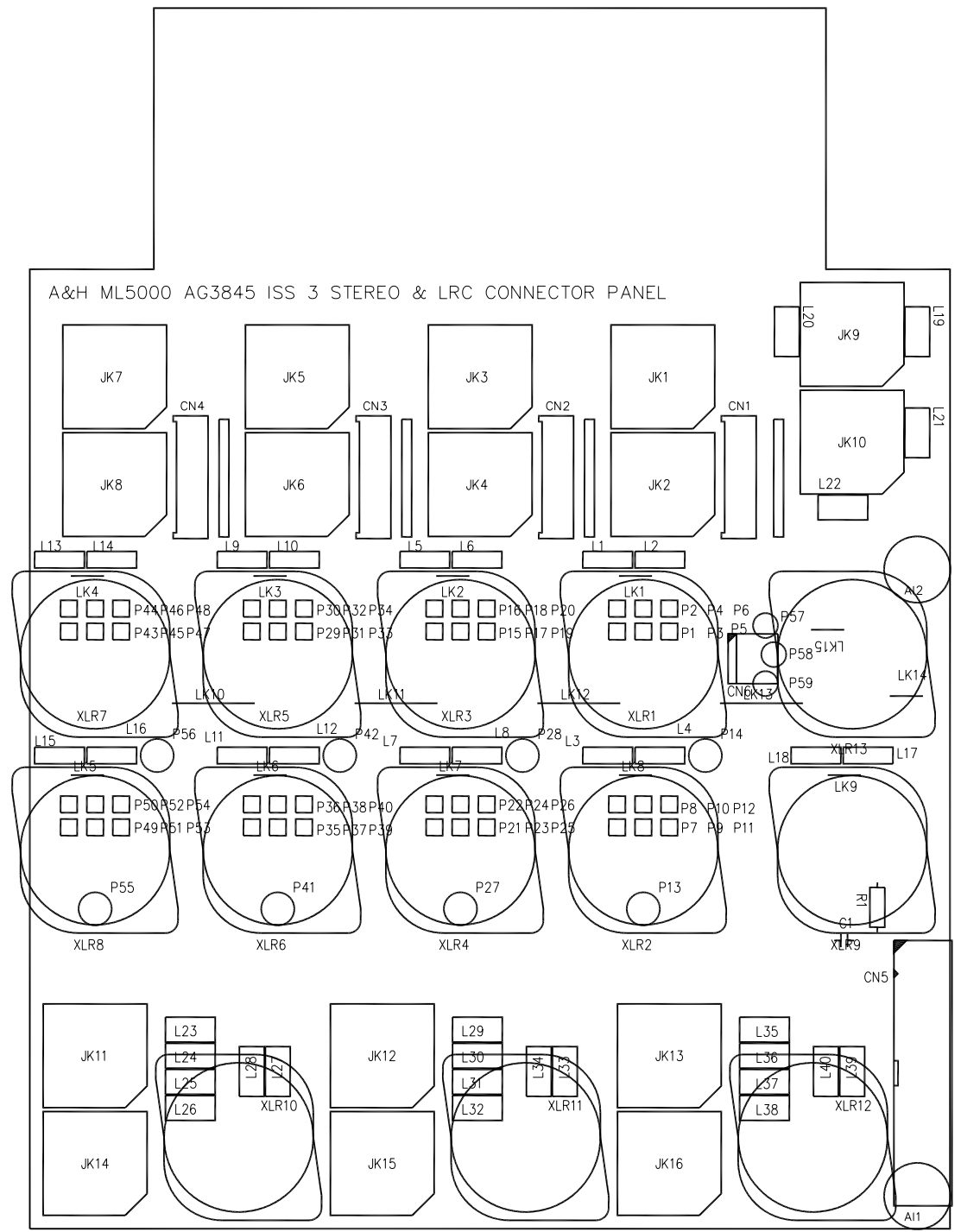
D22

ISS	REVISION	BY	DATE	NOTES	UNIT TITLE	DRAWING TITLE	DRAWING No	SHT 1 OF 1	ISSUE
A	ORIGIN	GMR	11/8/99	NOTES 1. RESISTORS MARKED * ARE 1% ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED 2. ELECTROLYTIC CAPACITORS ARE $\mu$ F/VOLTS 3.	ML5000	Stereo LRC and Control Slave	3720	1	2
B	Various logic changes	GMR	18/10/99		PCB AG 3720				
1	GROUND PLANE ADDED TO PCB MOUNTS	AAT	02-12-99						
2	GROUND PLANE ADDED TO PCB MOUNTS	AAT	22-02-00						

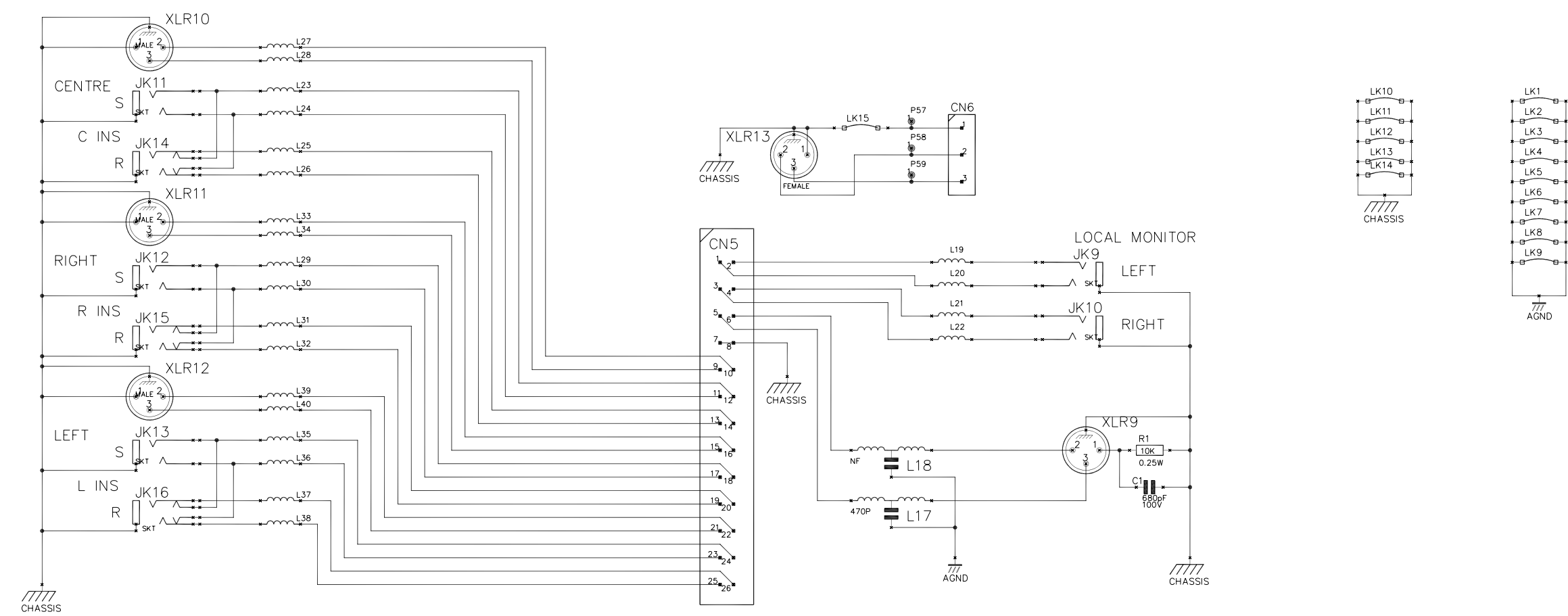
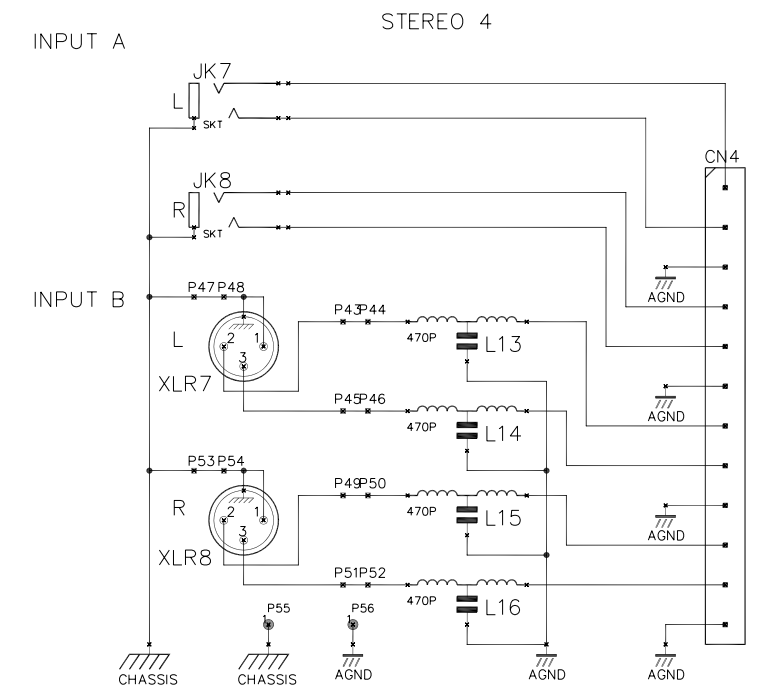
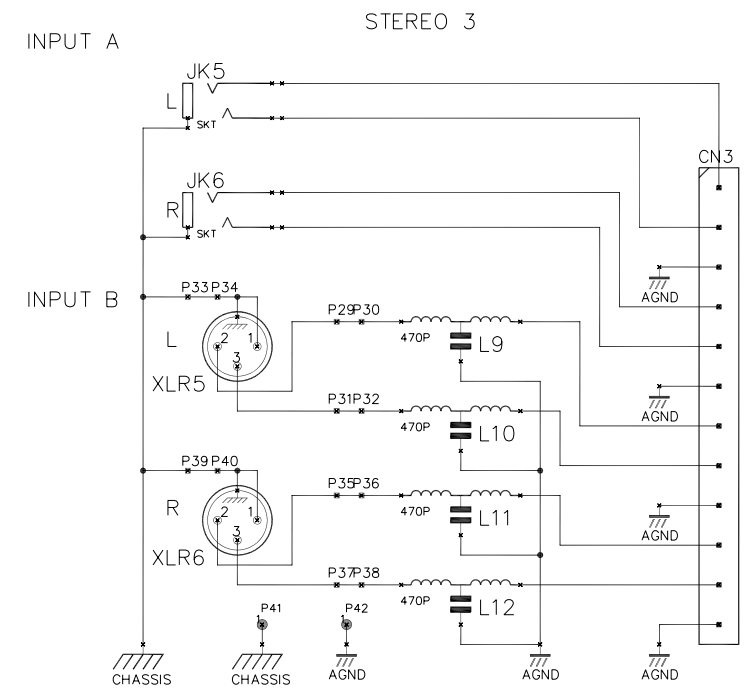
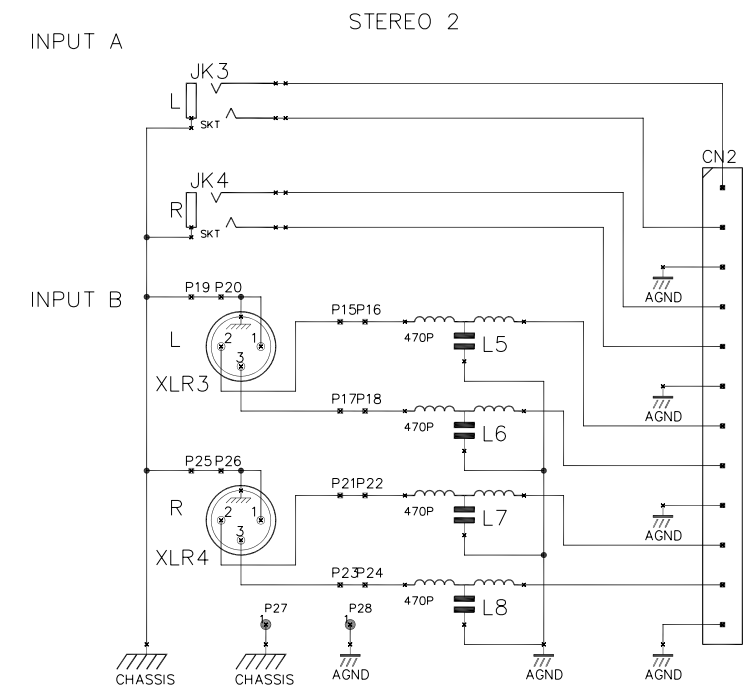
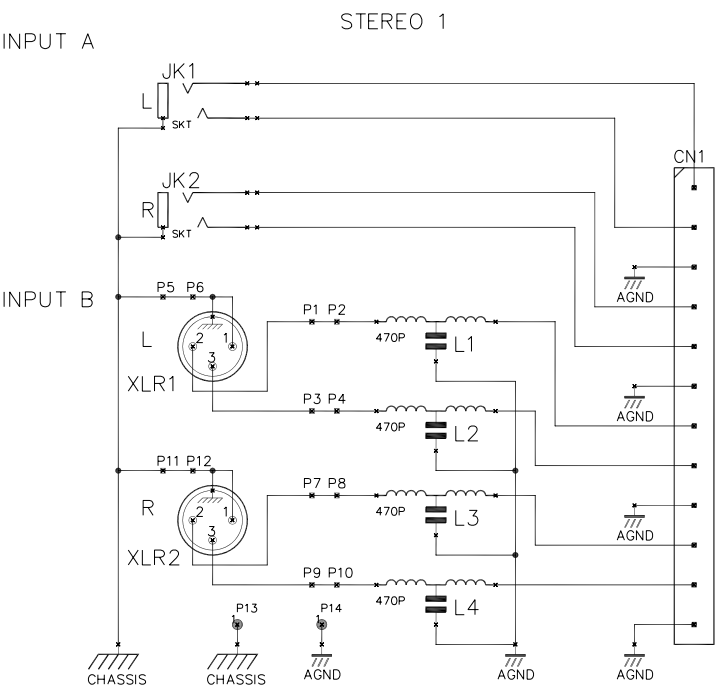
A1



A&H ML5000 AG3845 ISS 3 STEREO & LRC CONNECTOR PANEL



AG3845 ISS 3 TOP SILK AAT 23-03-00



**D24**

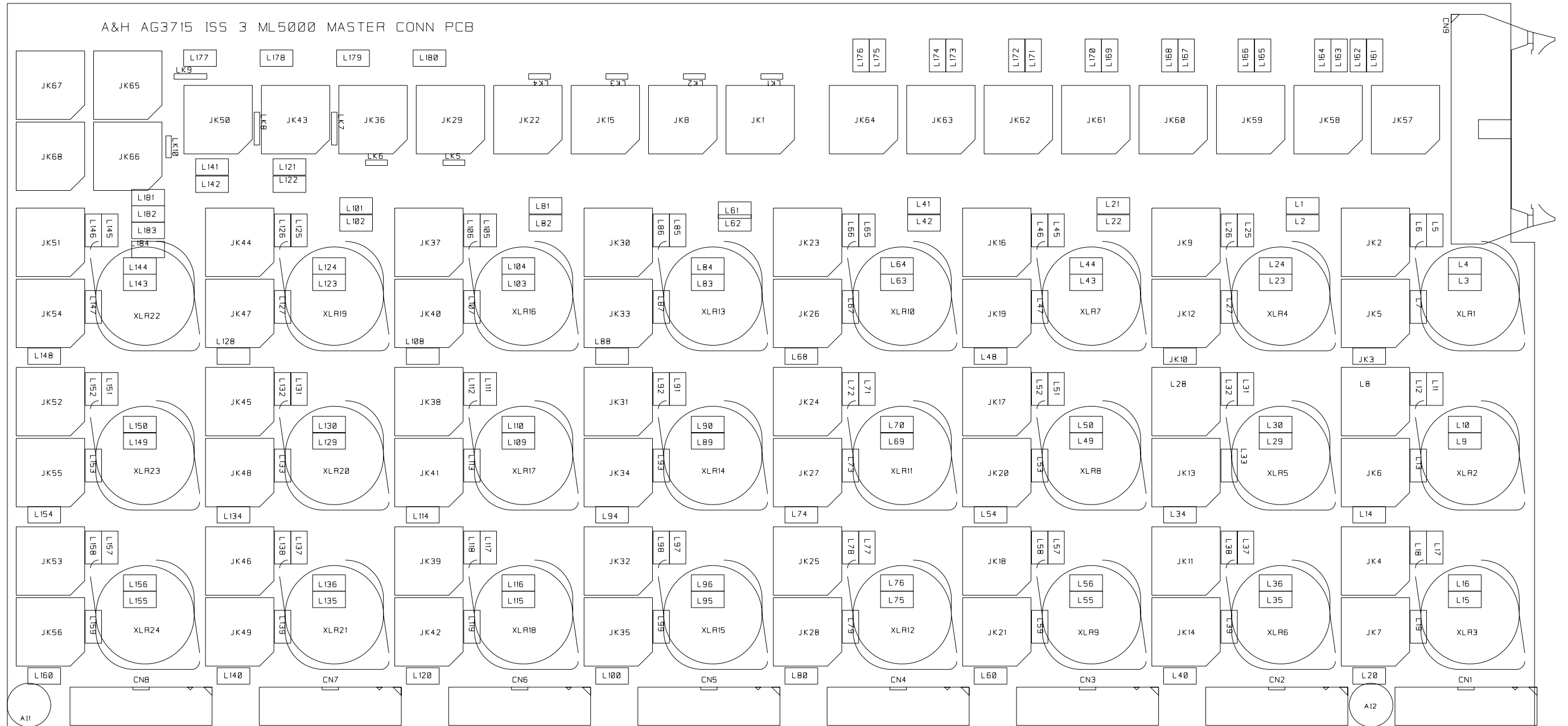
ISS	REVISION	BY	DATE
A	ORIGIN	AAI	27-08-99
2	PRODUCTION	AAI	23-03-00
3	GROUND PLANE CLEARANCE	AAI	10-09-01

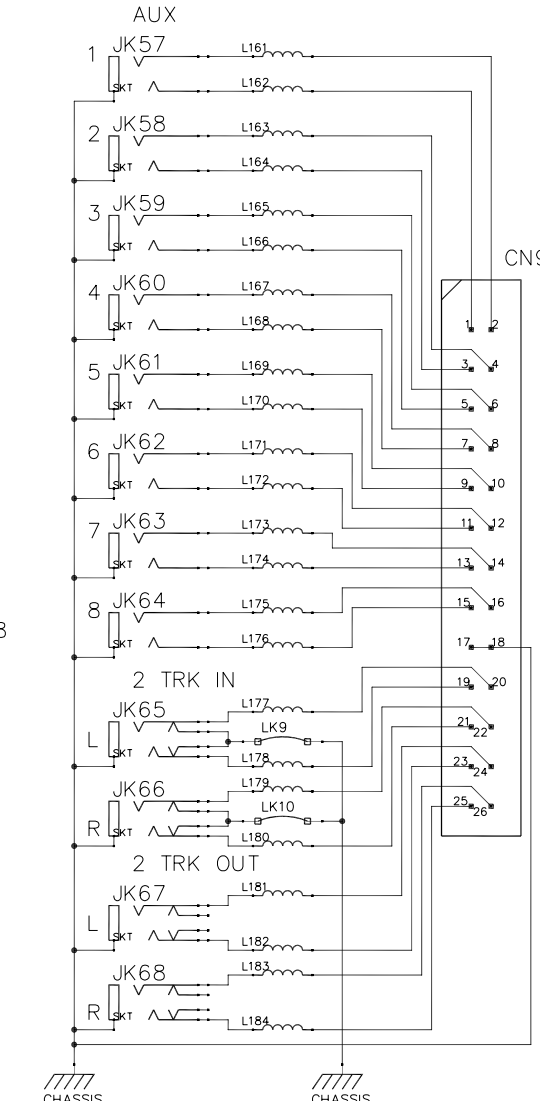
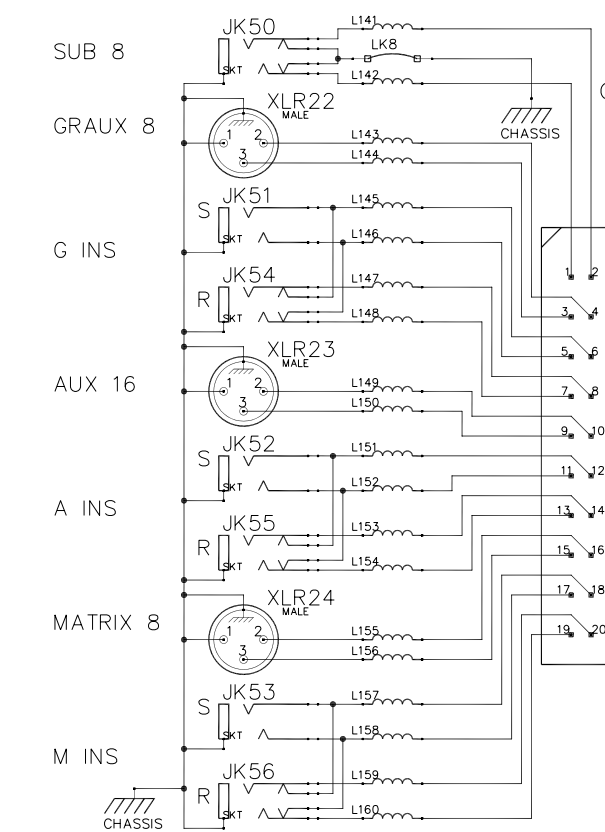
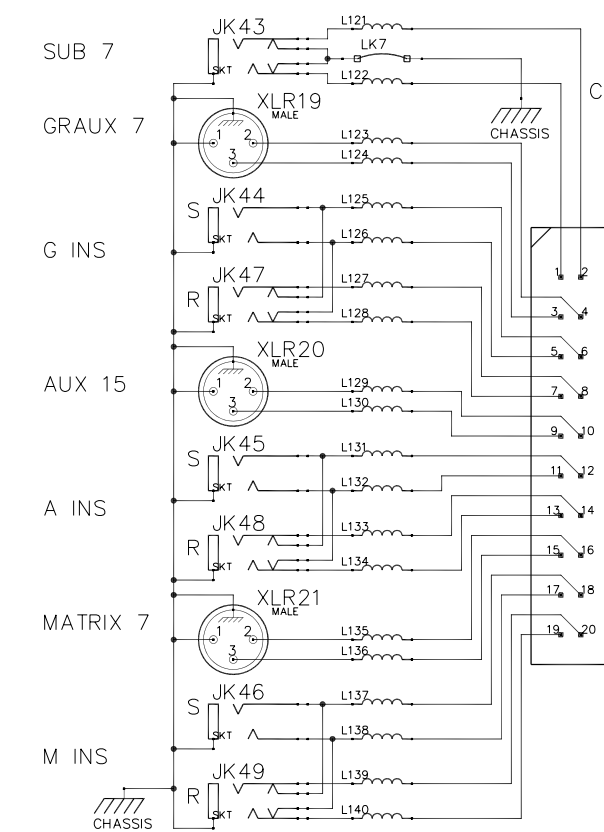
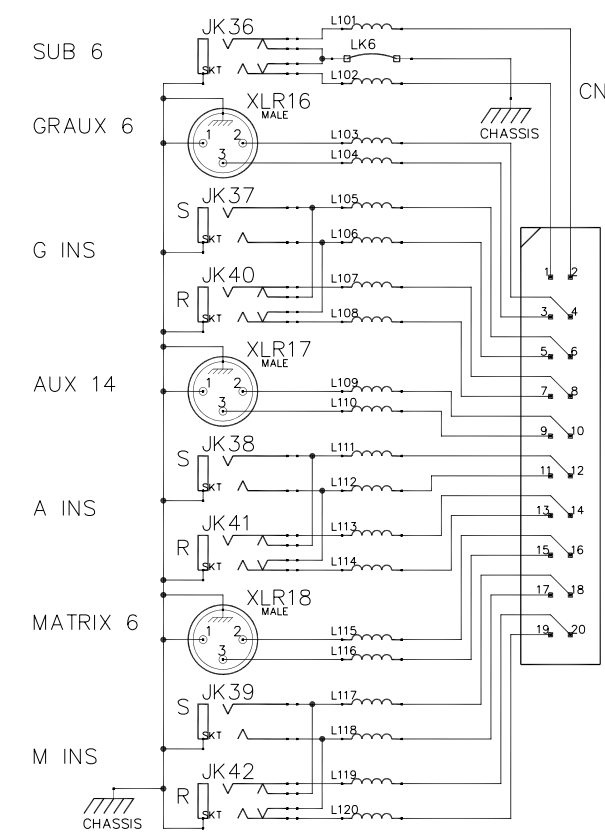
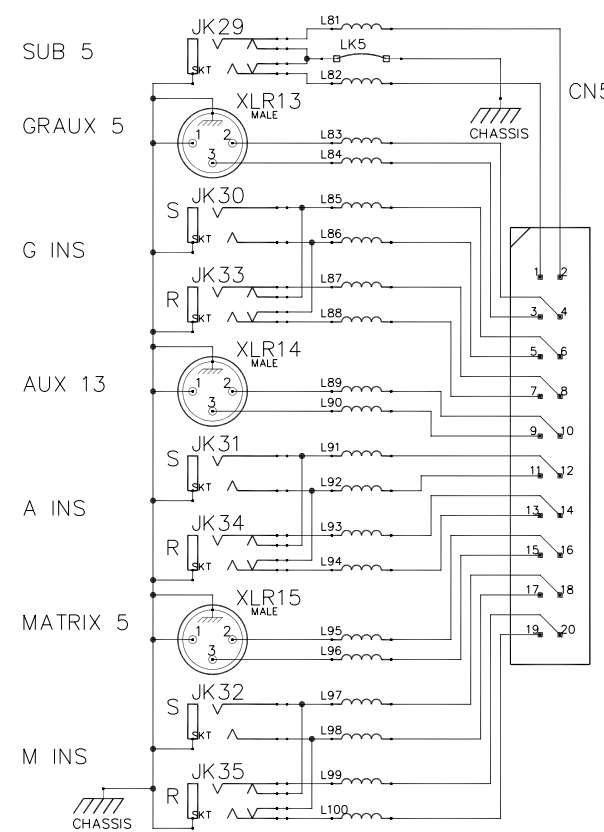
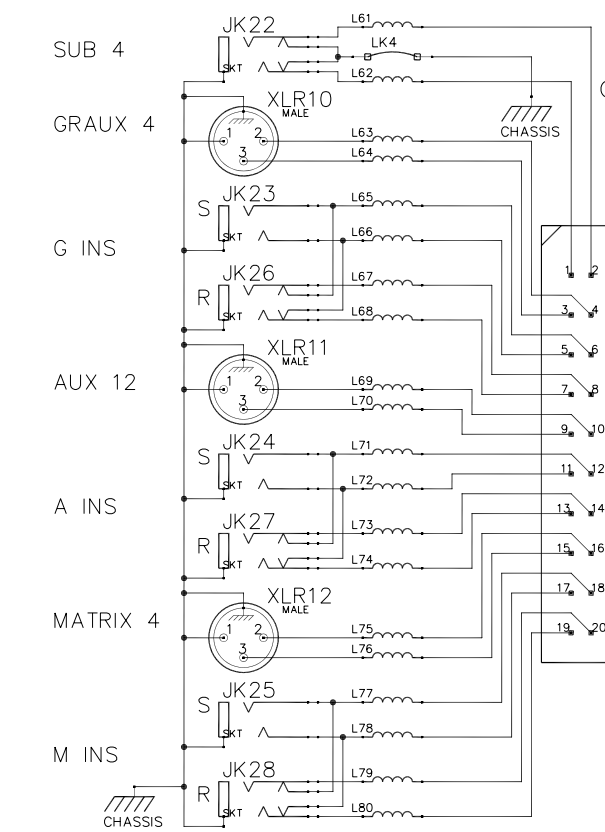
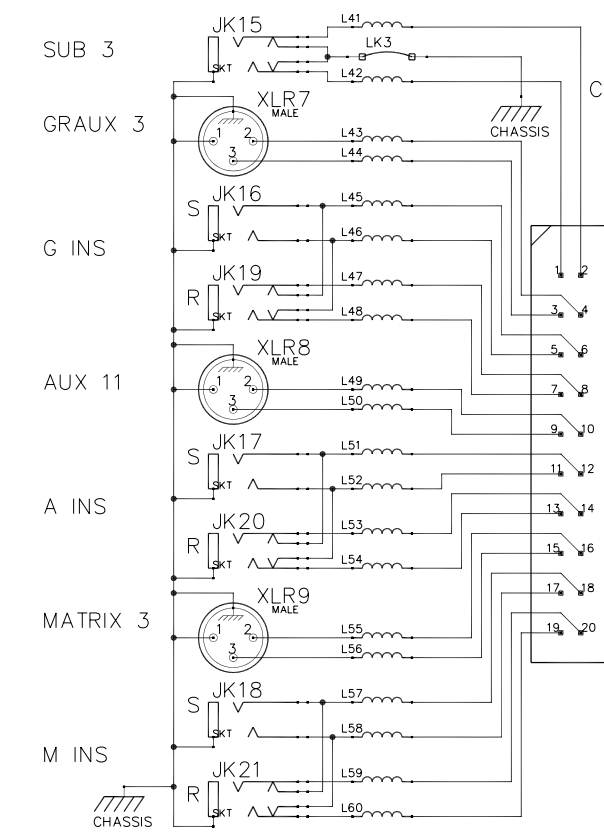
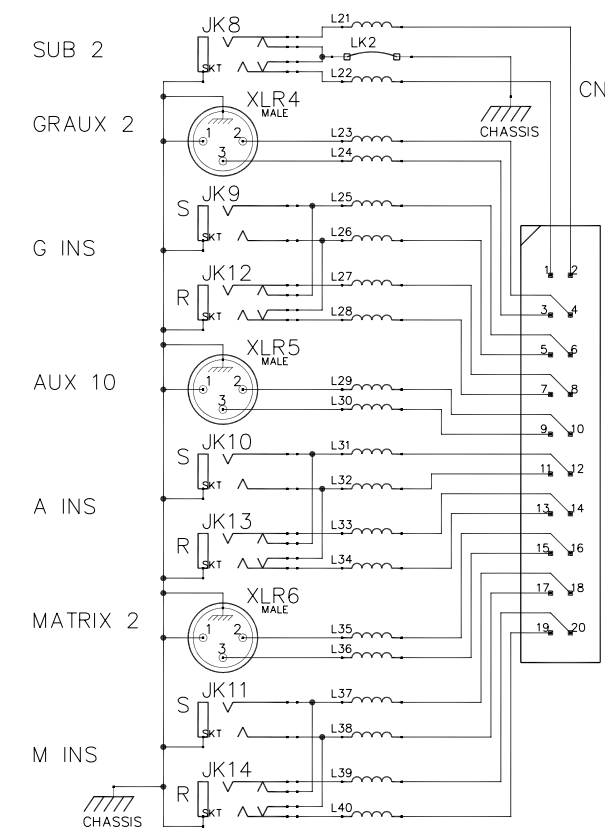
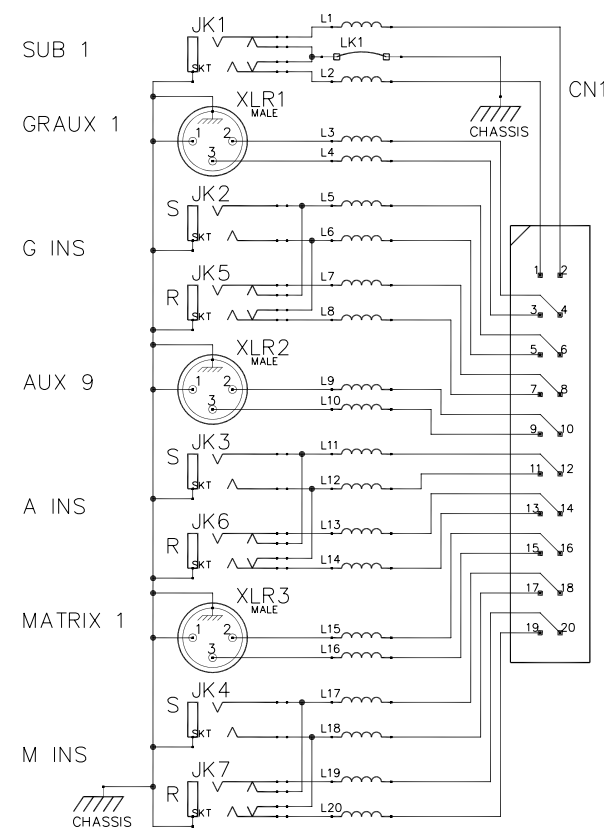
NOTES  
 1. RESISTORS MARKED \* ARE 1%  
 ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED  
 2. ELECTROLYTIC CAPACITORS ARE  $\mu$ F/VOLTS  
 3.

UNIT TITLE  
 ML5000  
 DRAWING TITLE  
 CIRCUIT DIAGRAM  
 STEREO LRC CONN  
 PCB AC 3845

ALLEN & HEATH  
 PENRYN, CORNWALL  
 ENGLAND, TR10 9LU  
 DRAWING No C C3845 SHT 1 of 1 ISSUE 3 A1

A&H AG3715 ISS 3 ML5000 MASTER CONN PCB





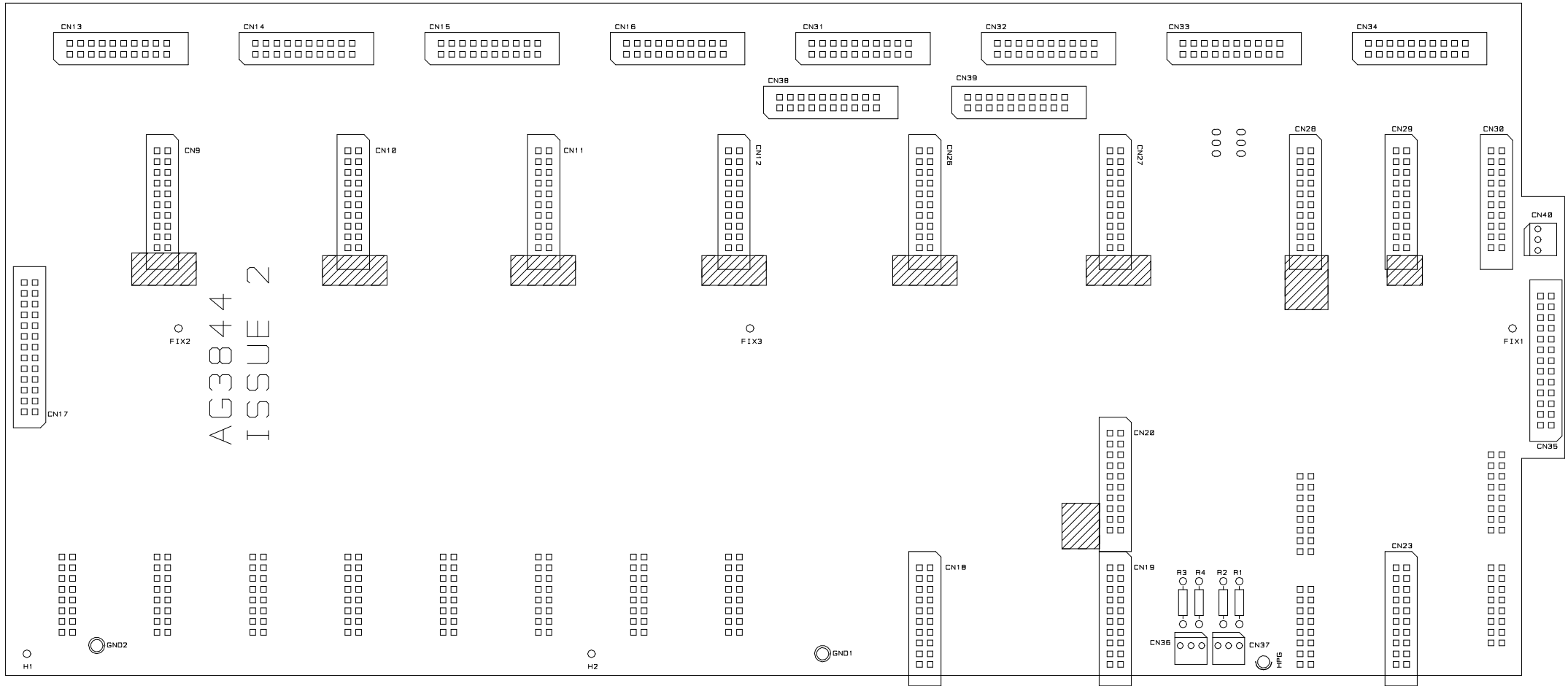
**D26**

ISS	REVISION	BY	DATE
A	ORIGIN	AAI	27-07-99
1	CN9 MV, CHG TO RA.GND ON XLR	AAI	13-12-99
2	SUBS AND 2 TRK NORMALISED	AAI	05-06-00
3	GROUND PLANE CLEARANCE	AAI	10-09-01

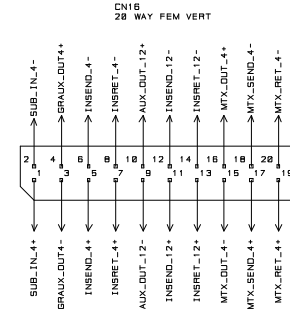
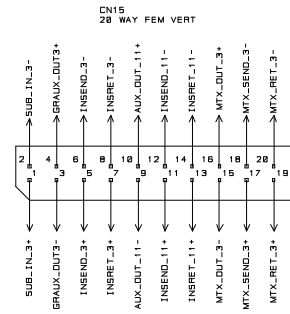
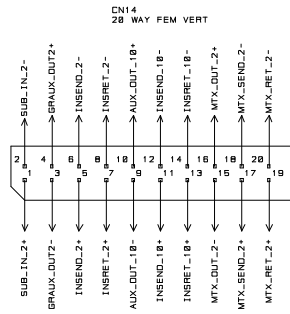
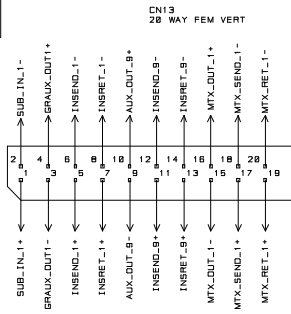
NOTES  
 1. RESISTORS MARKED \* ARE 1%  
 ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED  
 2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS  
 3.

UNIT TITLE  
 ML5000  
 DRAWING TITLE  
 MASTER CONNECTOR PCB  
 CIRCUIT DIAGRAM PCB AG 3715

ALLEN & HEATH  
 PENRYN, CORNWALL  
 ENGLAND, TR10 9LU  
 DRAWING No C3715 SHT 1 of 1  
 ISSUE 3 A1

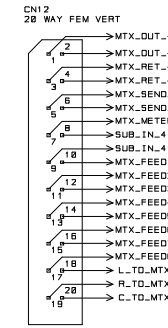
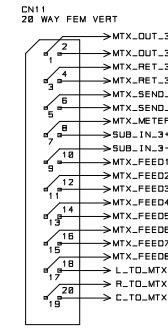
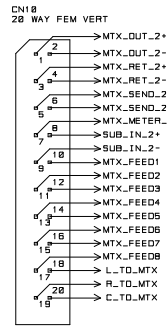
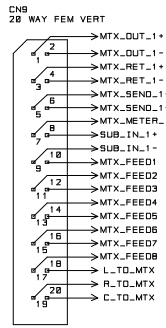
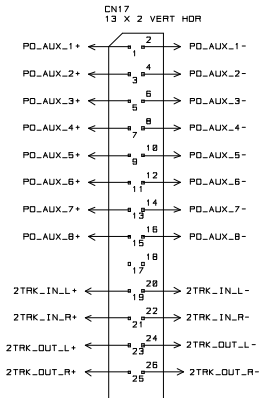


INITIAL	ISSUE	DATE
MG	2	8-5-00



CONNECTIONS TO REAR CONNECTOR BOARD

TO REAR CONNECTOR PCB



GROUP/AUX 1

GROUP/AUX 2

GROUP/AUX 3

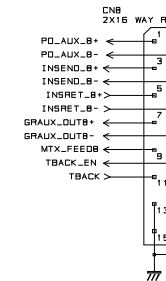
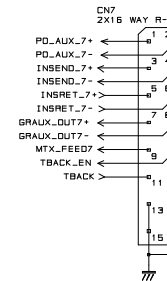
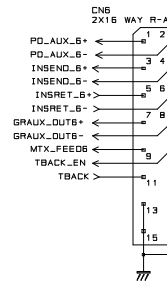
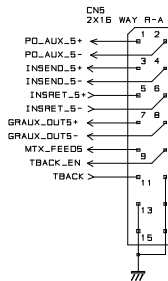
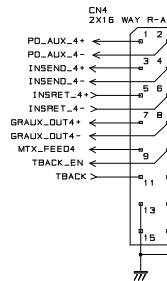
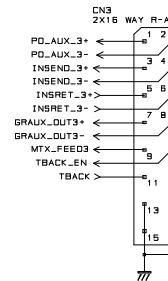
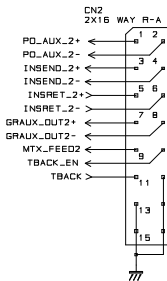
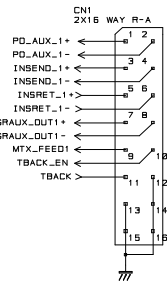
GROUP/AUX 4

GROUP/AUX 5

GROUP/AUX 6

GROUP/AUX 7

GROUP/AUX 8



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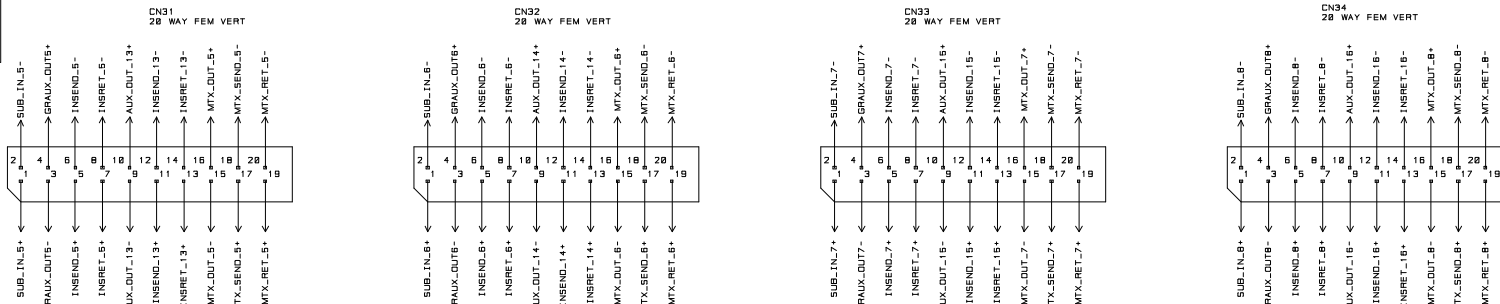
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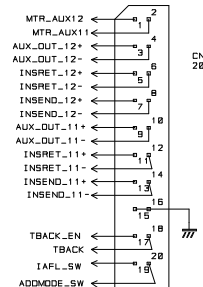
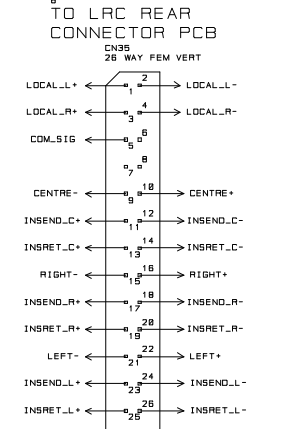
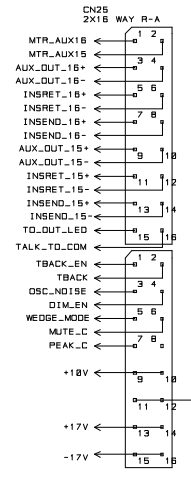
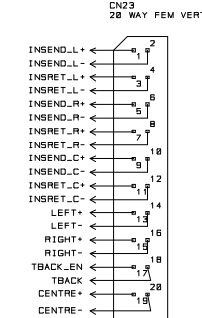
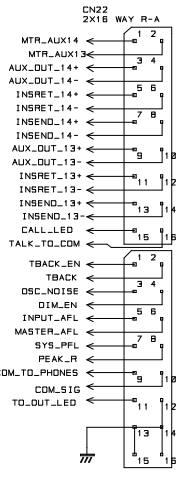
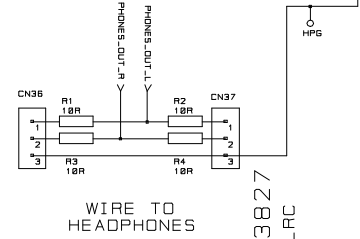
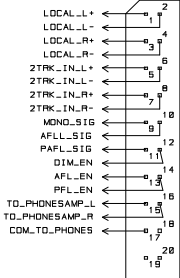
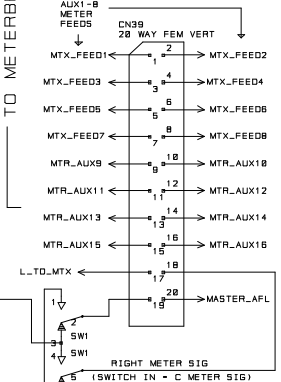
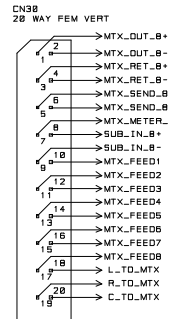
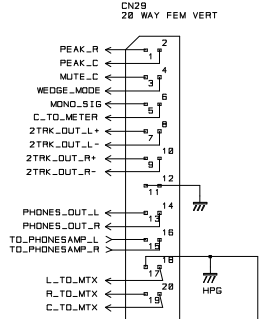
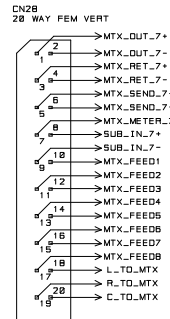
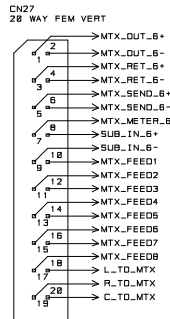
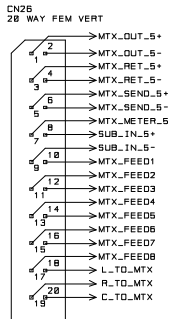
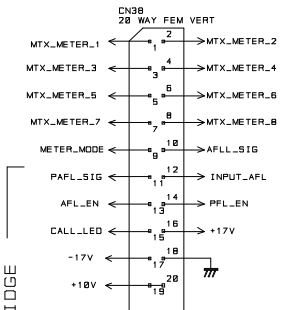
TITLE ML5000  
BACKPLANE  
SIGNAL DIST PCB

DRG NO. 3844

INITIAL	ISSUE	DATE
MG	2	8-5-00



CONNECTIONS TO REAR CONNECTOR BOARD



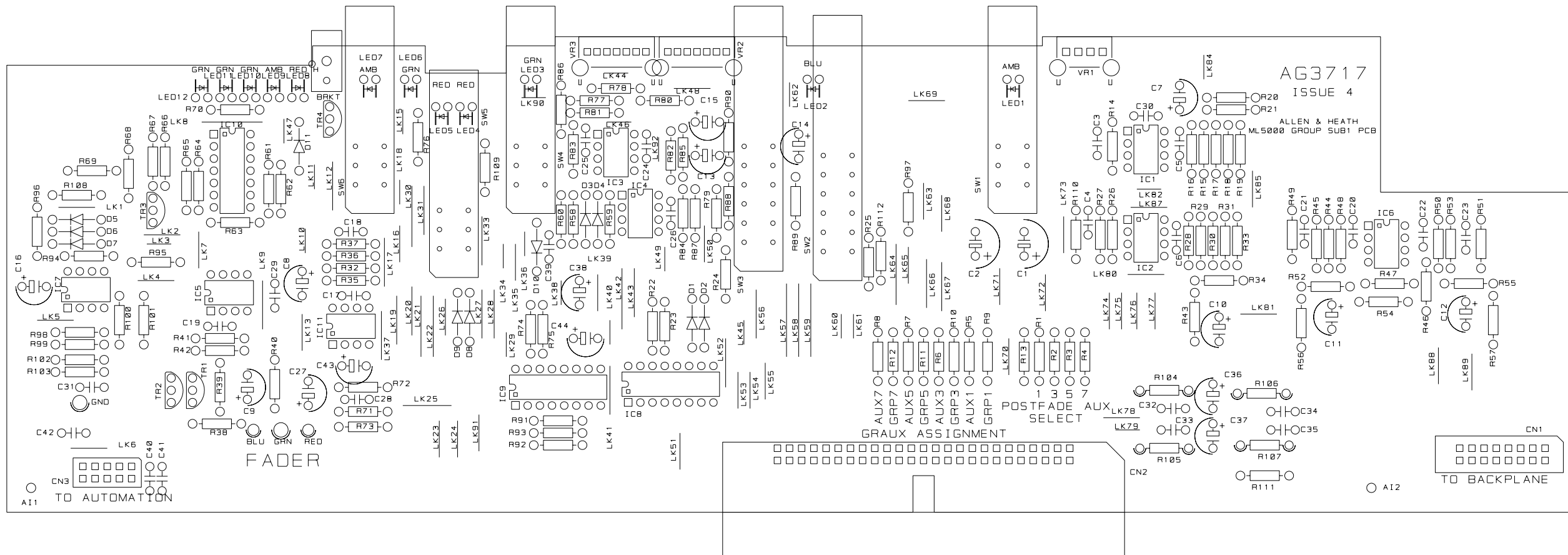
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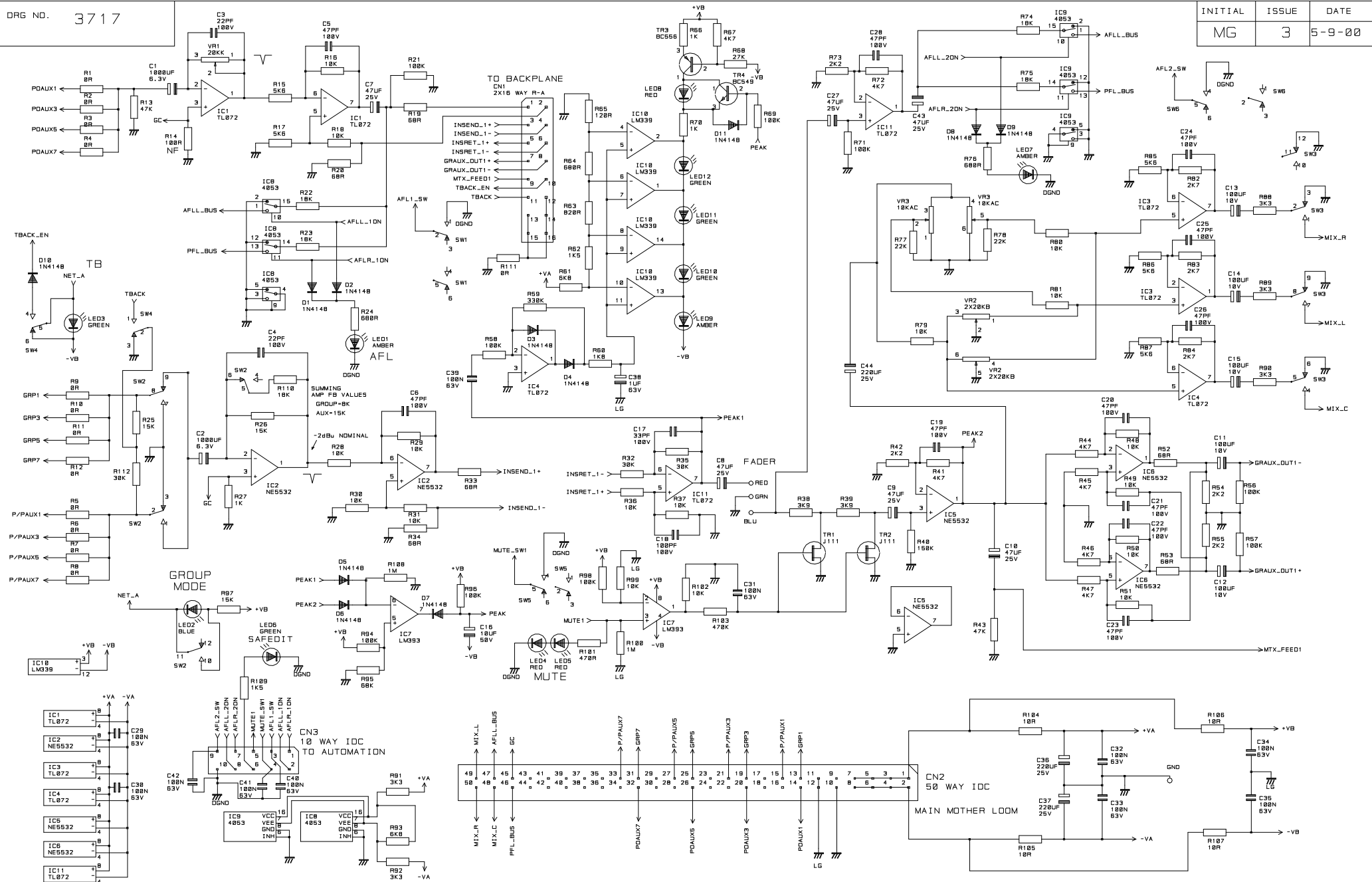
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 PENRYN  
 CORNWALL  
 TR10 9LU  
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TITLE ML5000  
 BACKPLANE  
 SIGNAL DIST PCB  
 DRG NO. 3844  
 SHT. 2 OF 2





INITIAL	ISSUE	DATE
MG	3	5-9-00



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NOTES

VR1 20K  
 VR2 2X20K  
 VR3 10K

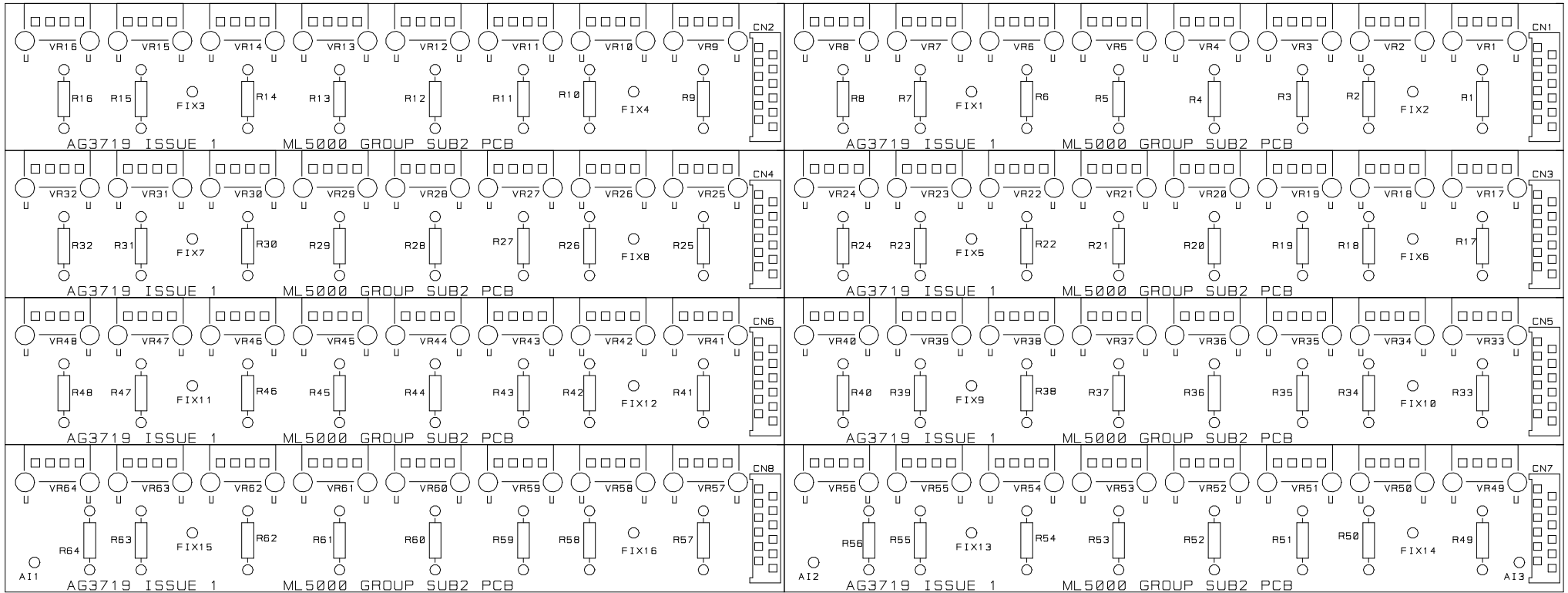
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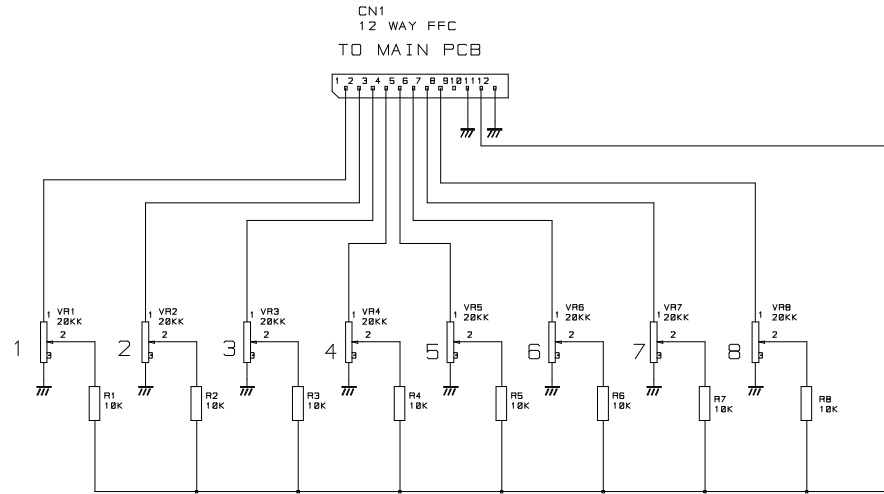
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 KERNICK INDUSTRIAL EST  
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 CORNWALL  
 TR10 9LU  
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TITLE  
 ML5000  
 GROUP SUB1

DRG NO. 3717

SHT. 1 OF 1



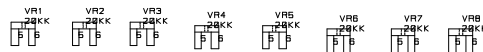


THIS CIRCUIT IS REPEATED ANOTHER 7 TIMES  
PER 8 WAY PANEL

D33

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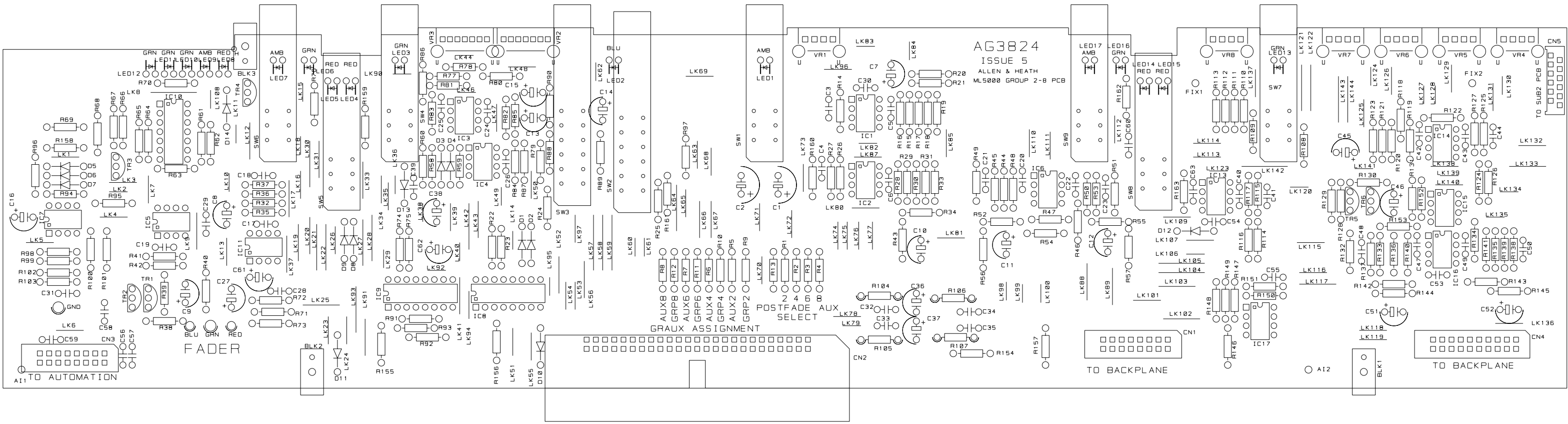


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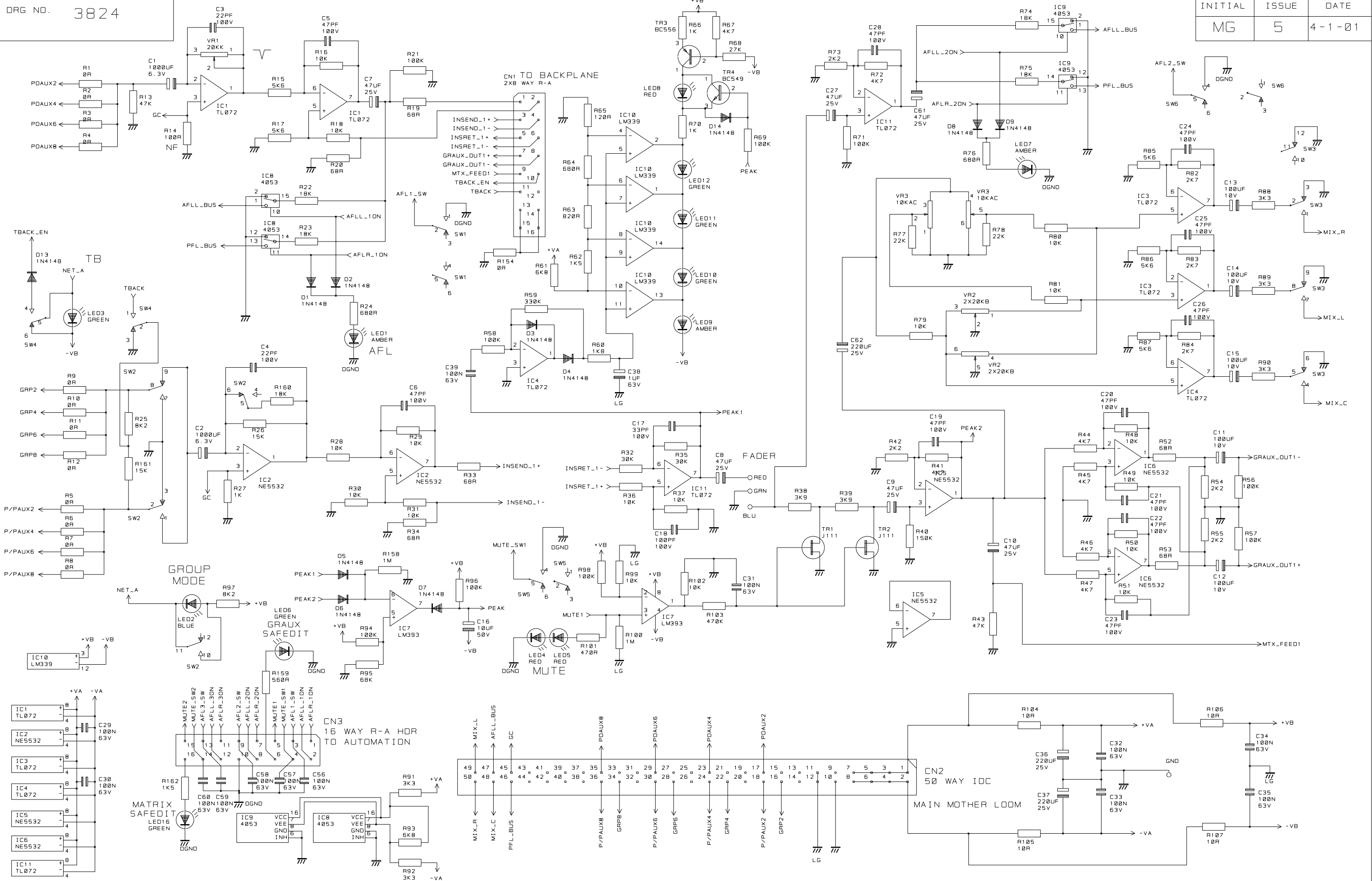
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TITLE  
ML5000  
GROUP SUB2

DRG NO. 3719



INITIAL	ISSUE	DATE
MG	5	4-1-01



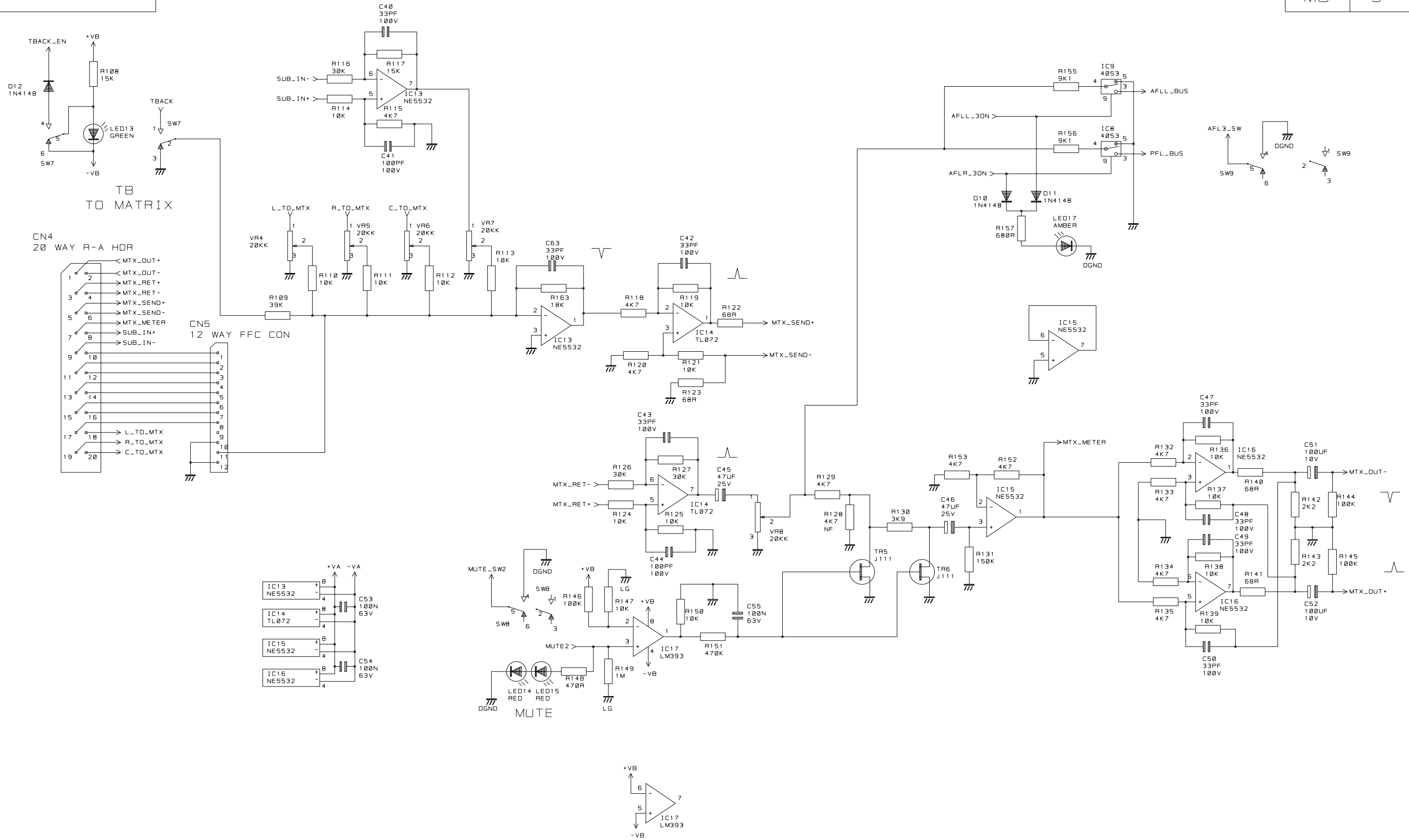
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**D35**

NOTES

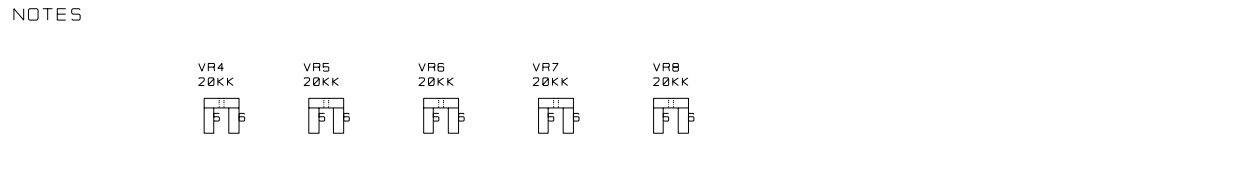
DRN. MG

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TITLE  
 ML5000  
 GROUP 2 TO 8  
 DRG NO. 3824  
 SHT. 1 OF 2



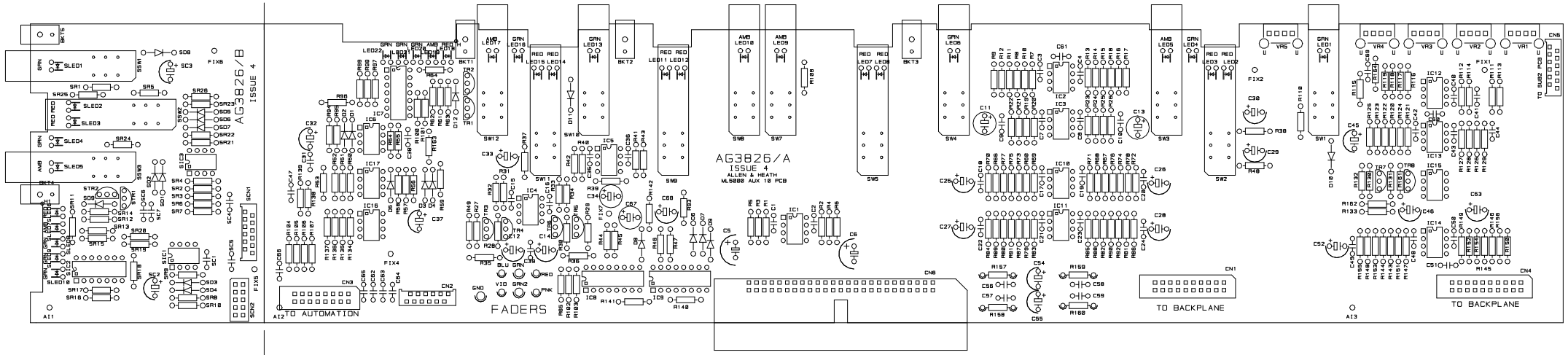
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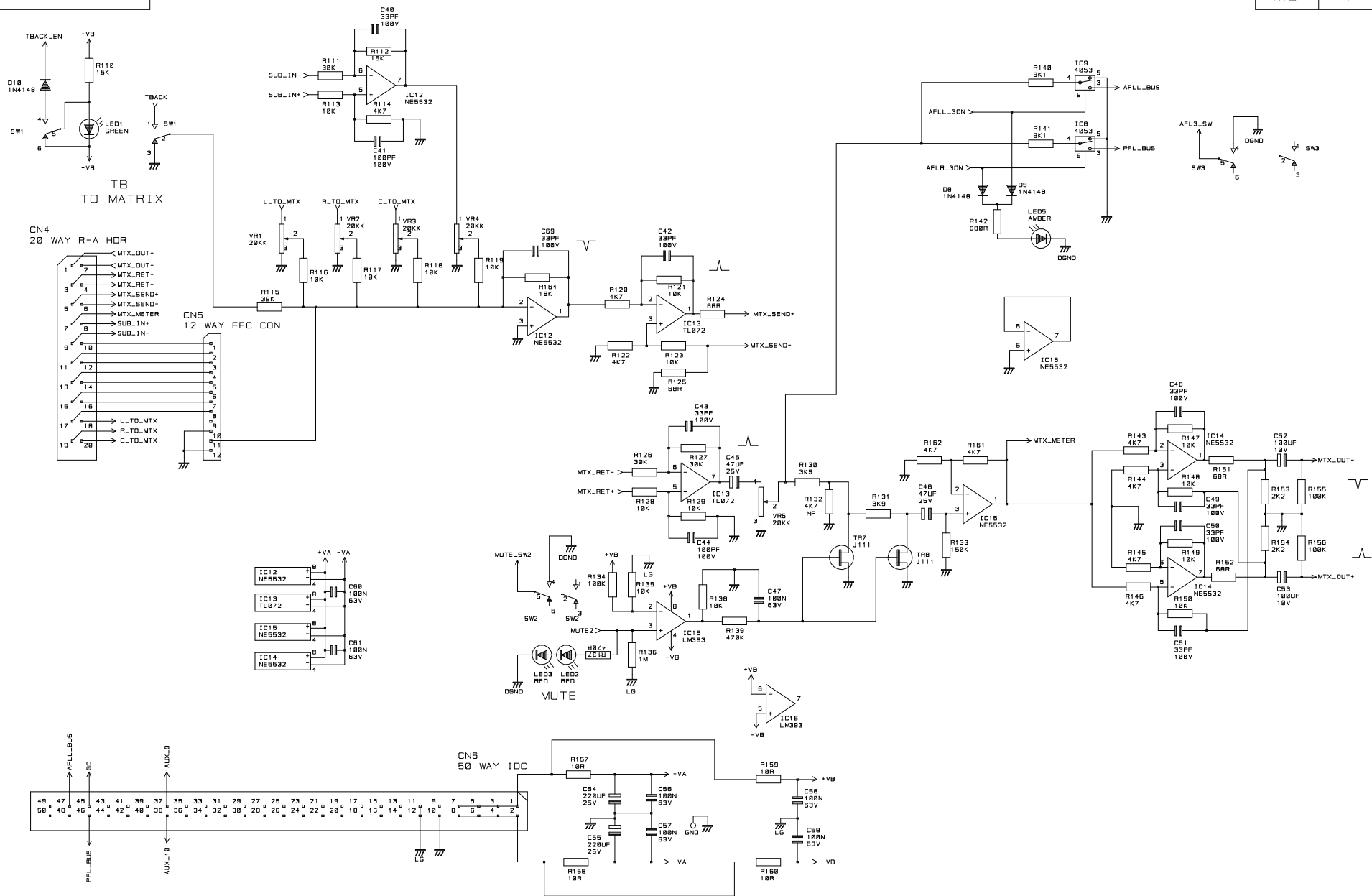
ALLEN & HEATH  
 KERNICK INDUSTRIAL EST  
 PENRYN  
 CORNWALL  
 TR10 9LU  
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TITLE  
 ML5000  
 GROUP 2 TO 8  
 DRG NO. 3824









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NOTES

VR1 20K	VR2 20K	VR3 20K	VR4 20K	VR5 20K

DRN. MG

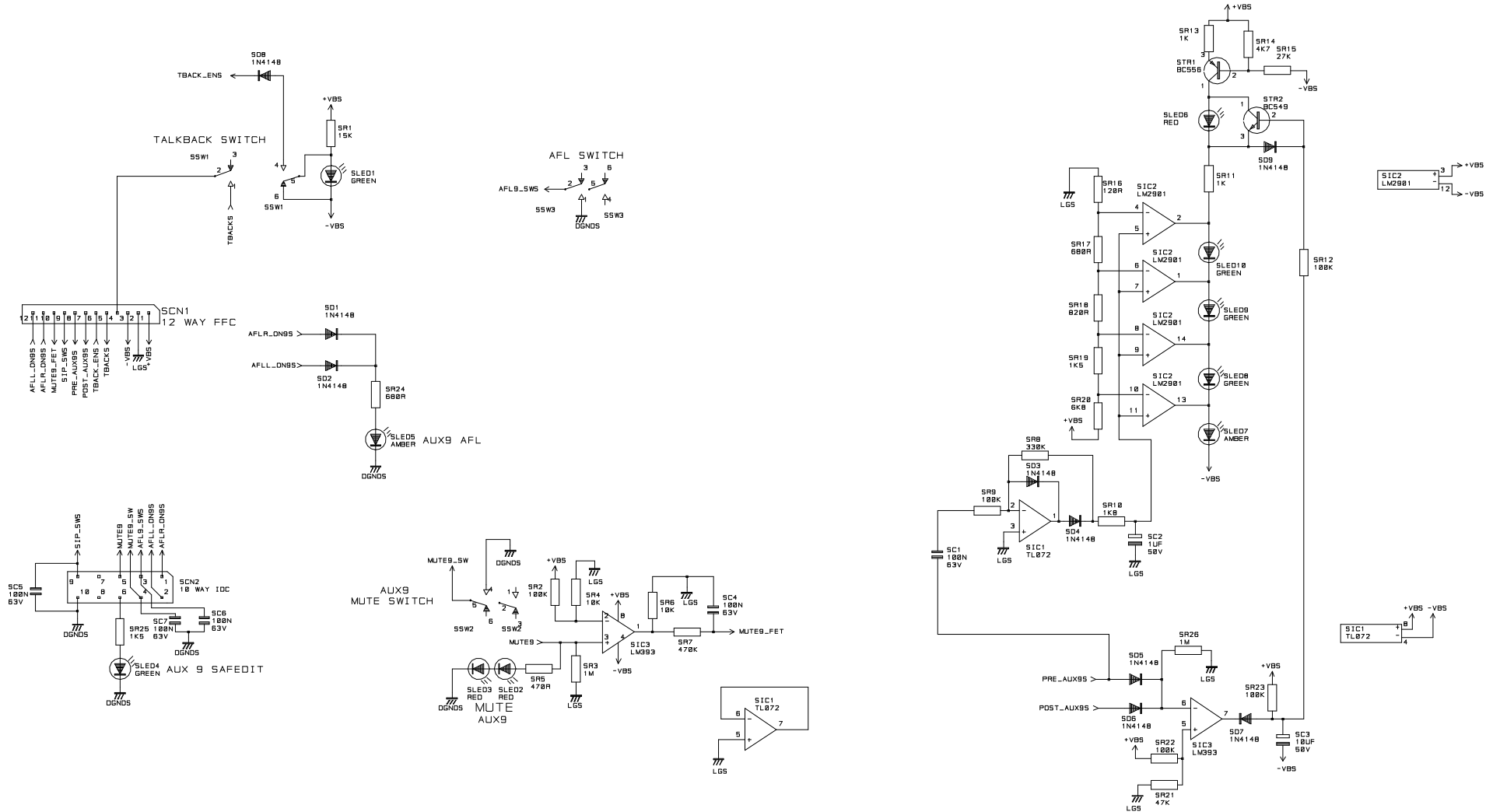
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 CORNWALL  
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TITLE  
 ML5000  
 AUX 10 PCB

DRG NO. 3826

SHT. 2 OF 3



D40

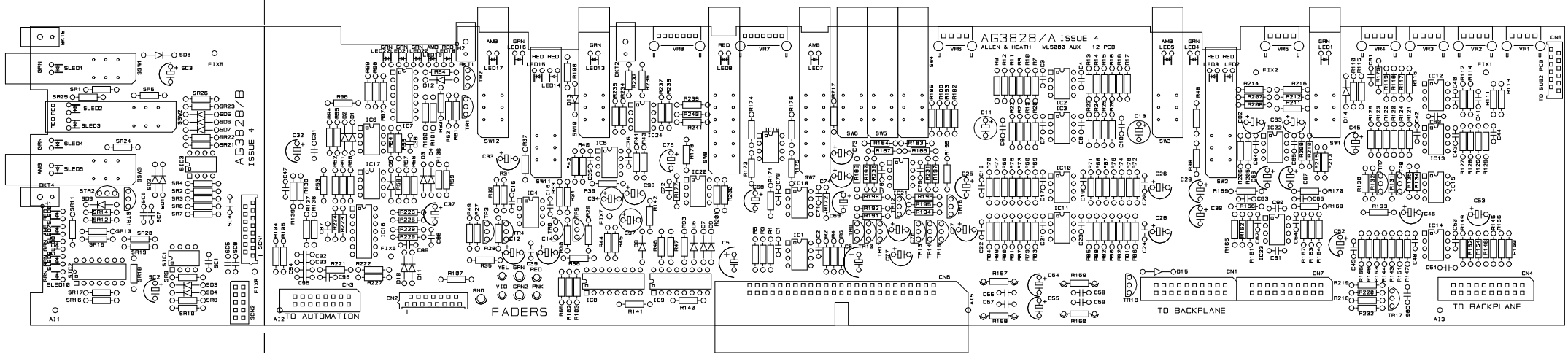
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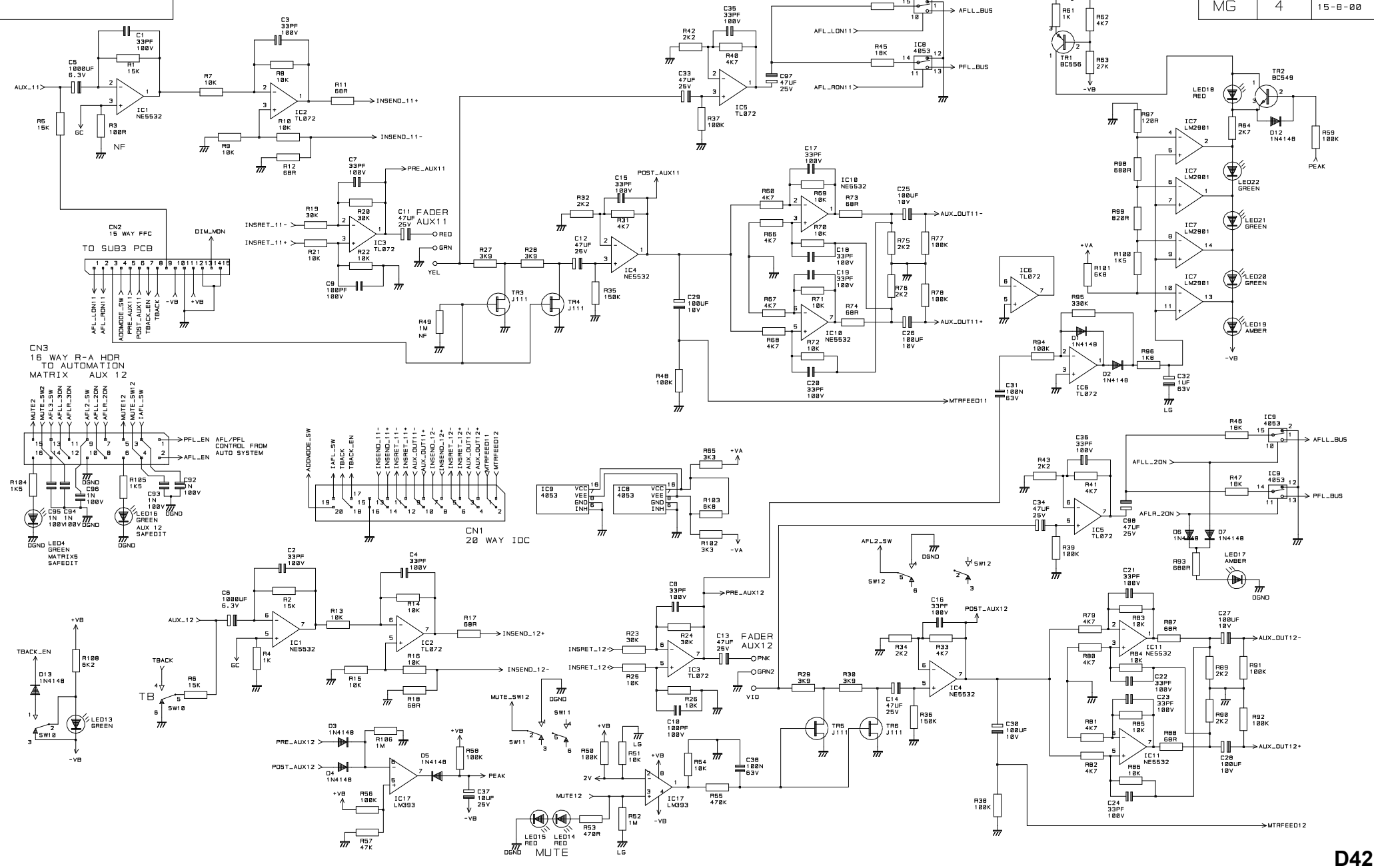
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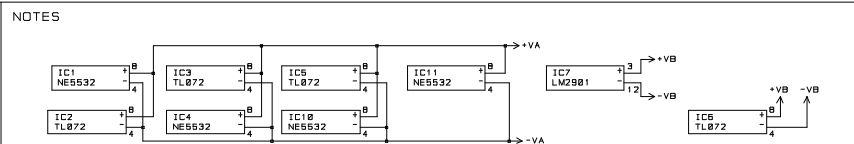
TITLE  
 ML5000  
 AUX 10 PCB  
 DRG NO. 3826



INITIAL	ISSUE	DATE
MG	4	15-8-00



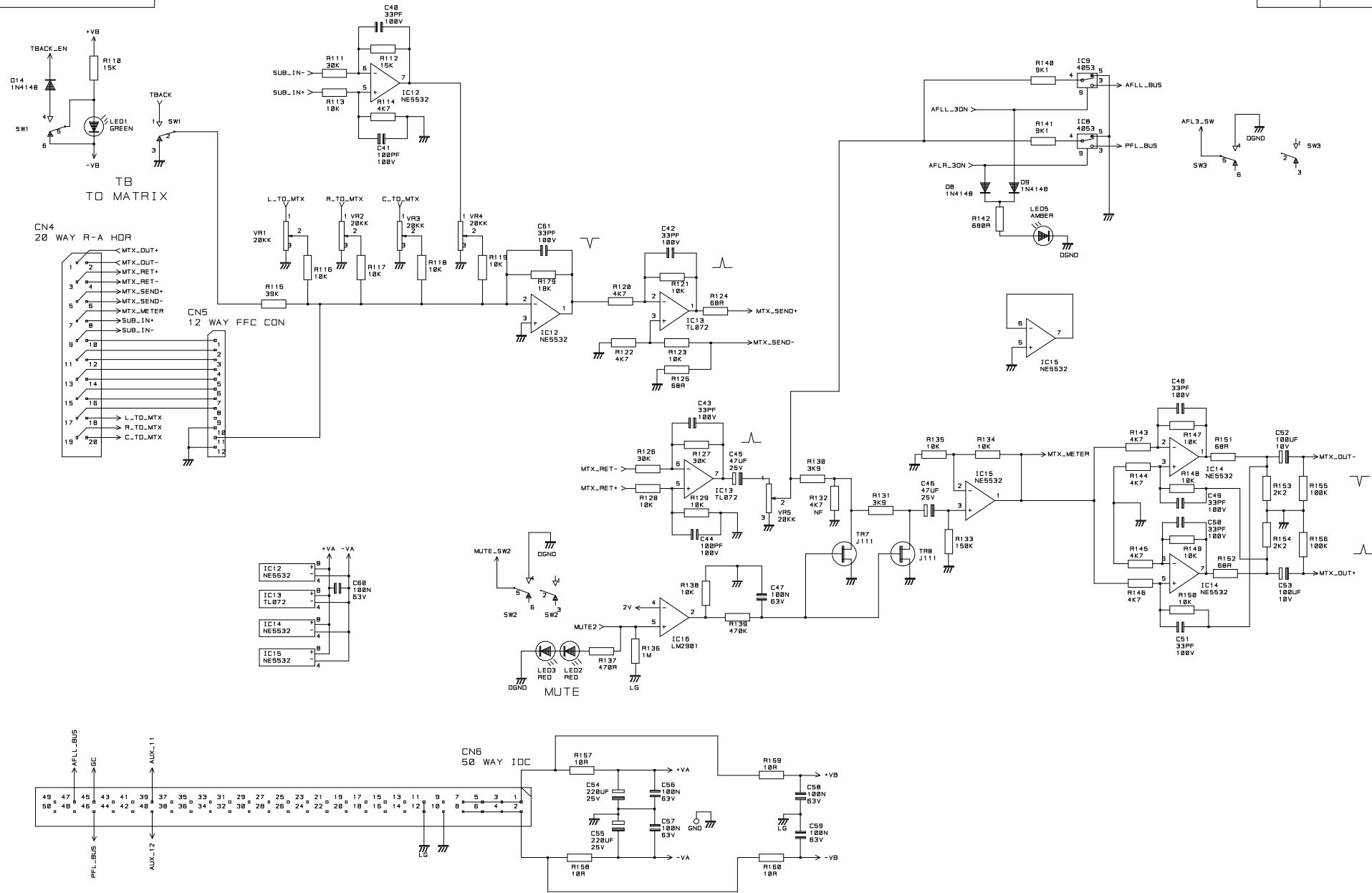
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TITLE  
 ML5000  
 AUX 12 PCB  
 DRG NO. 3828  
 SHT. 1 OF 4



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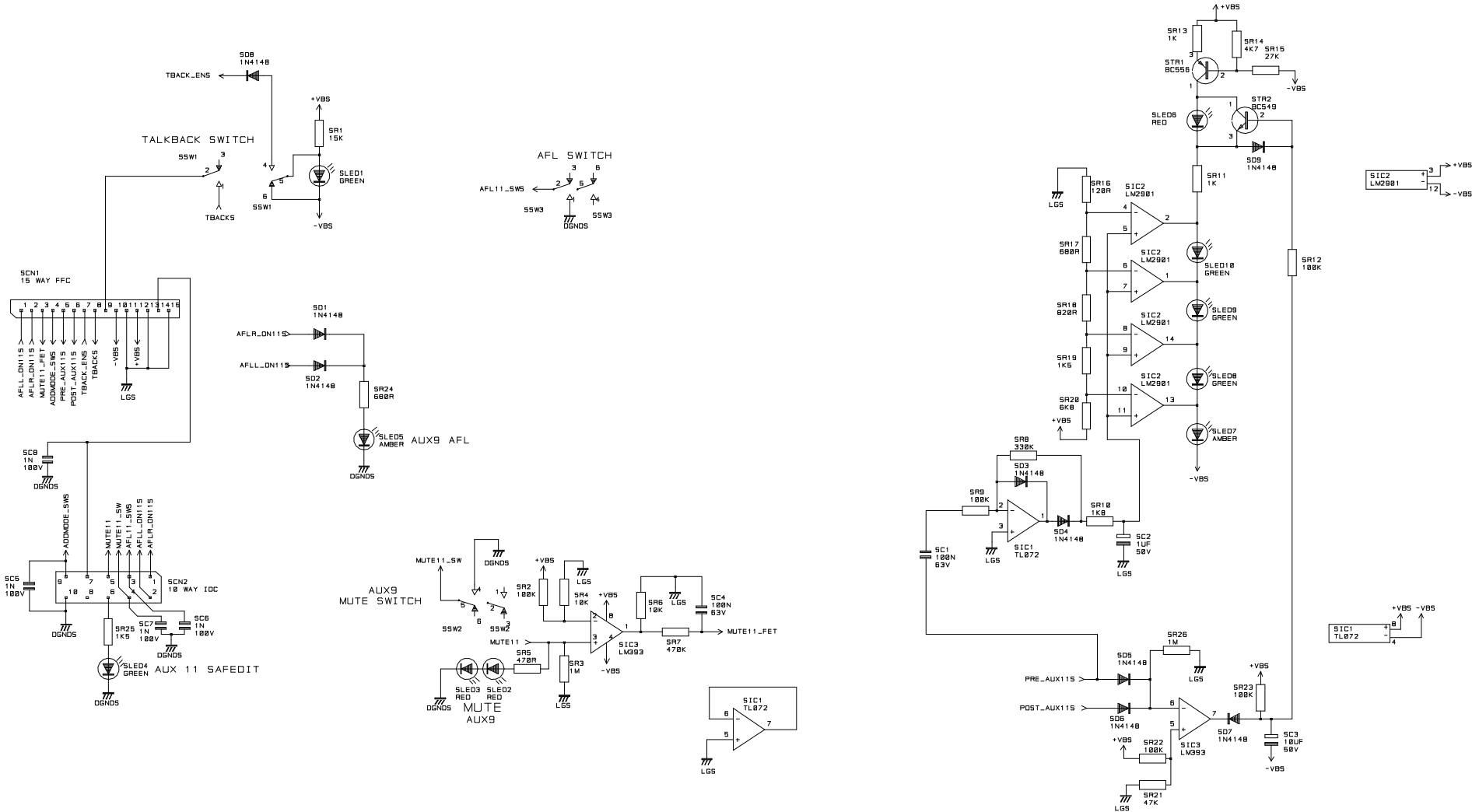
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 CORNWALL  
 TR10 9LU  
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TITLE

ML5000  
 AUX 12 PCB

DRG NO.

3828



D44

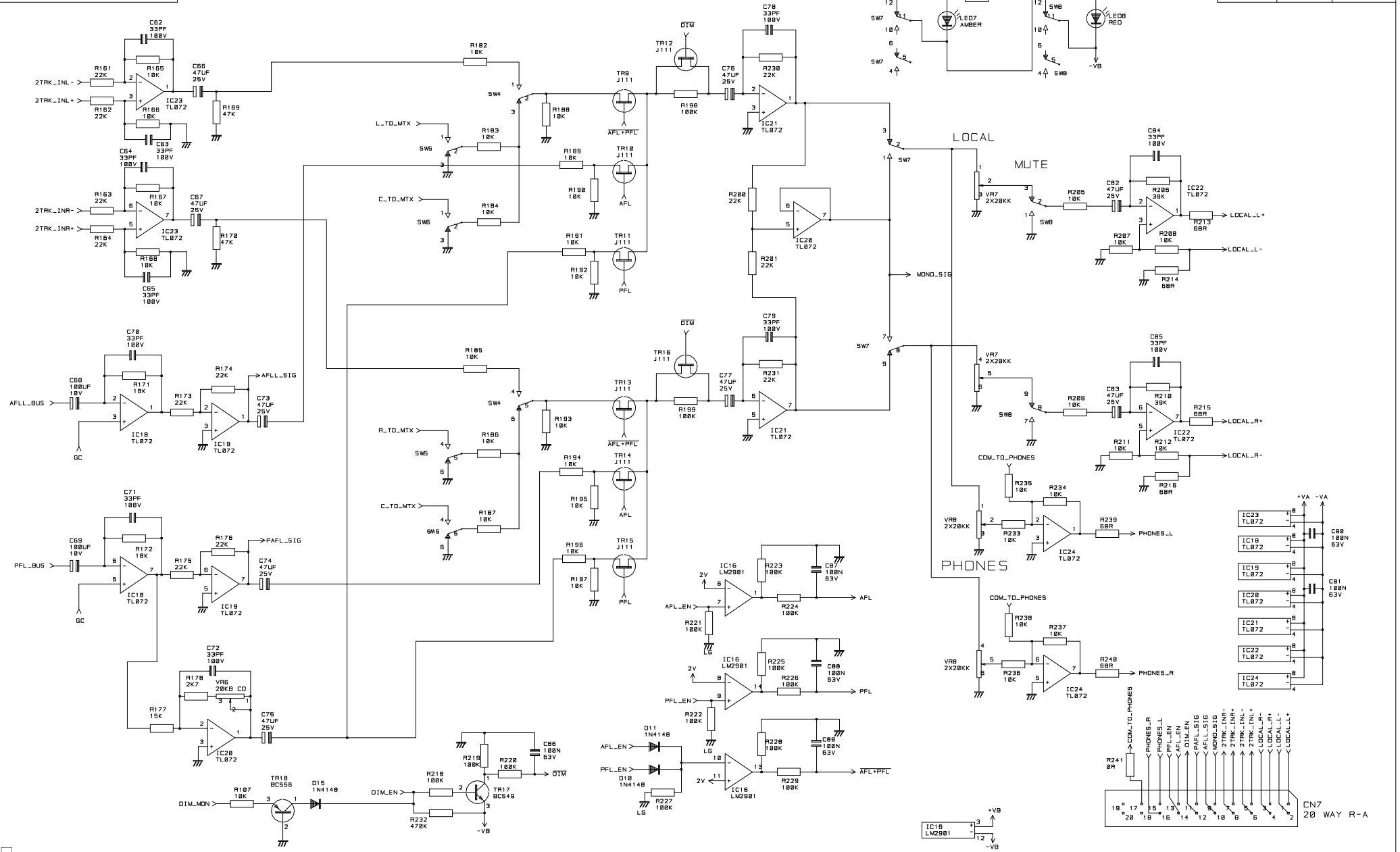
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TITLE  
 ML5000  
 AUX 12 PCB  
 DRG NO. 3828



D45

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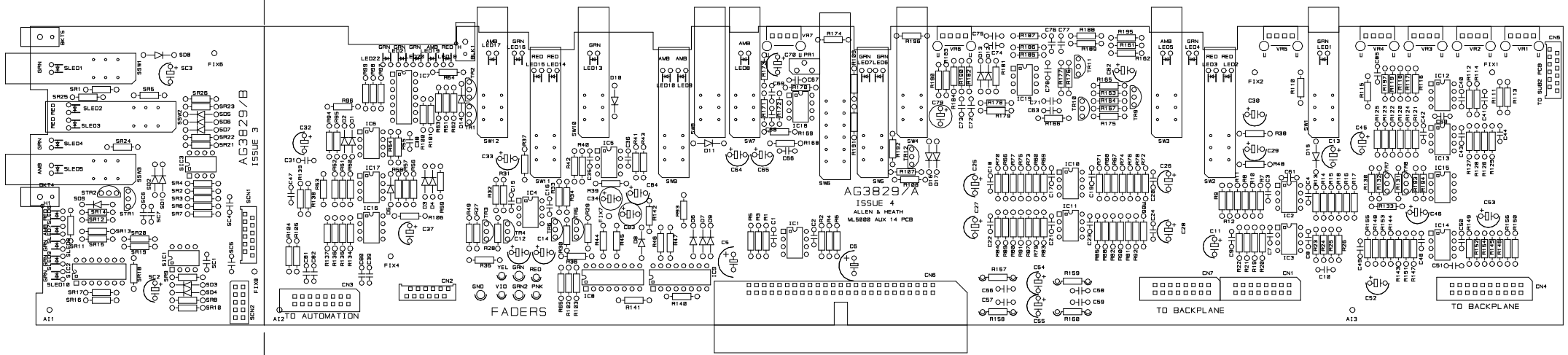
VR6 20KB CD  
 VR7 2X20KK  
 VR8 2X20KK

DRN. MG

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 PENRYN  
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 TR10 9LU  
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 FAX: 01326 377097

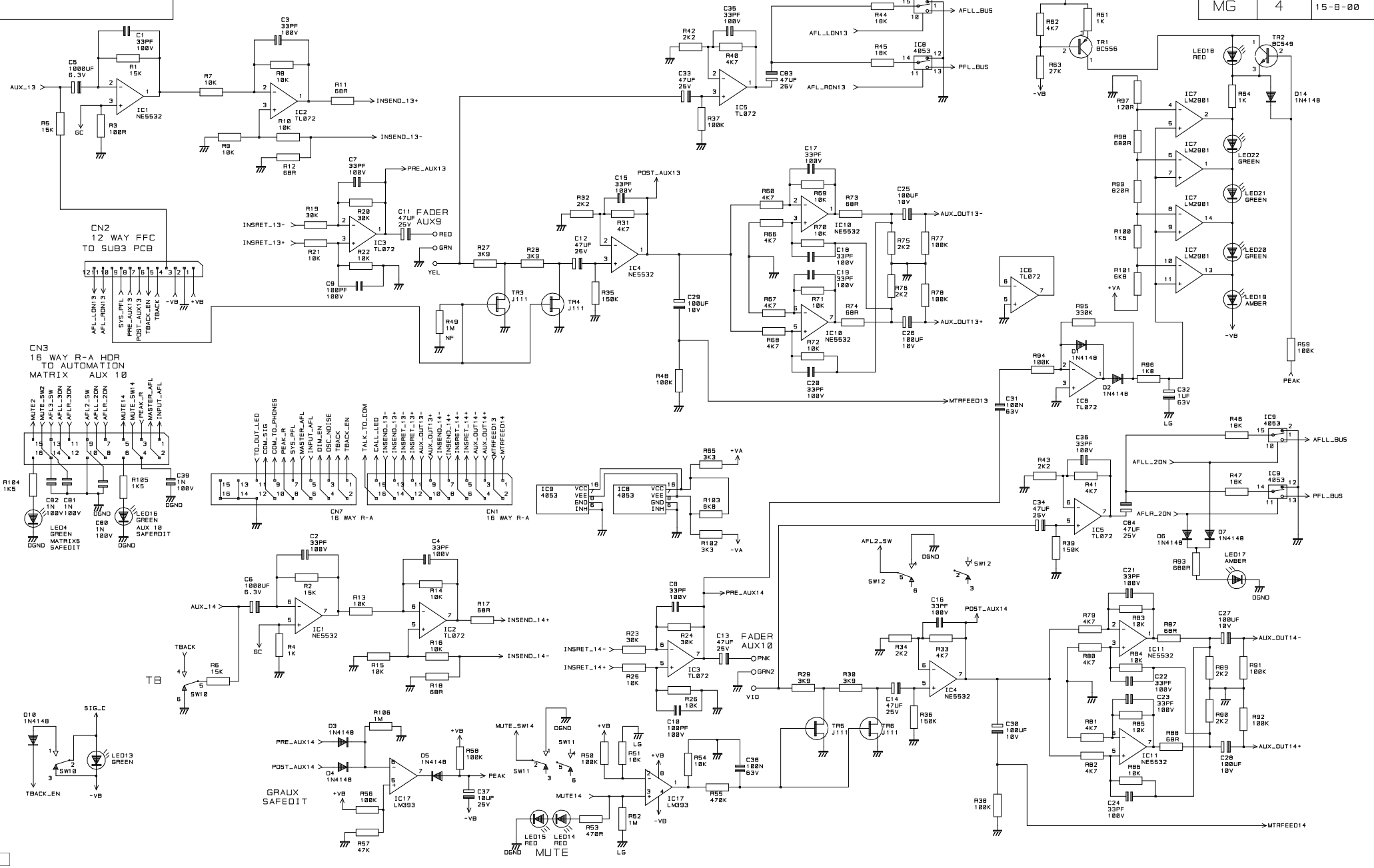
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 ML5000  
 AUX 12 PCB

DRG NO. 3828



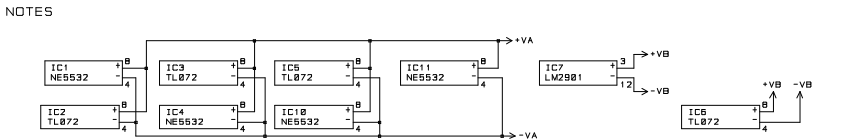


INITIAL	ISSUE	DATE
MG	4	15-8-00



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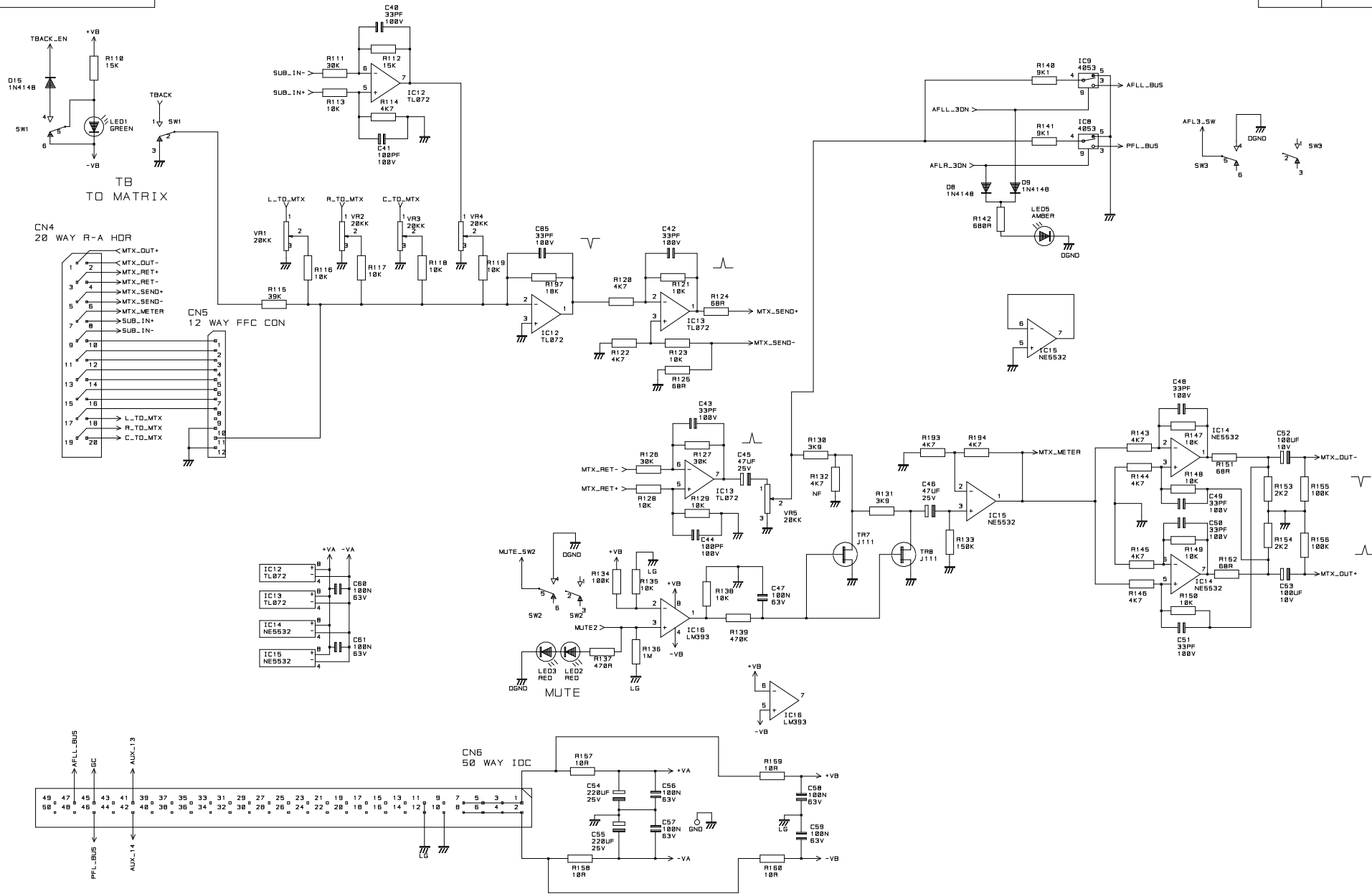
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TITLE  
 ML5000  
 AUX 14 PCB  
 DRG NO. 3829  
 SHT. 1 OF 4



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NOTES

VR1 20K	VR2 20K	VR3 20K	VR4 20K	VR5 20K

DRN. MG

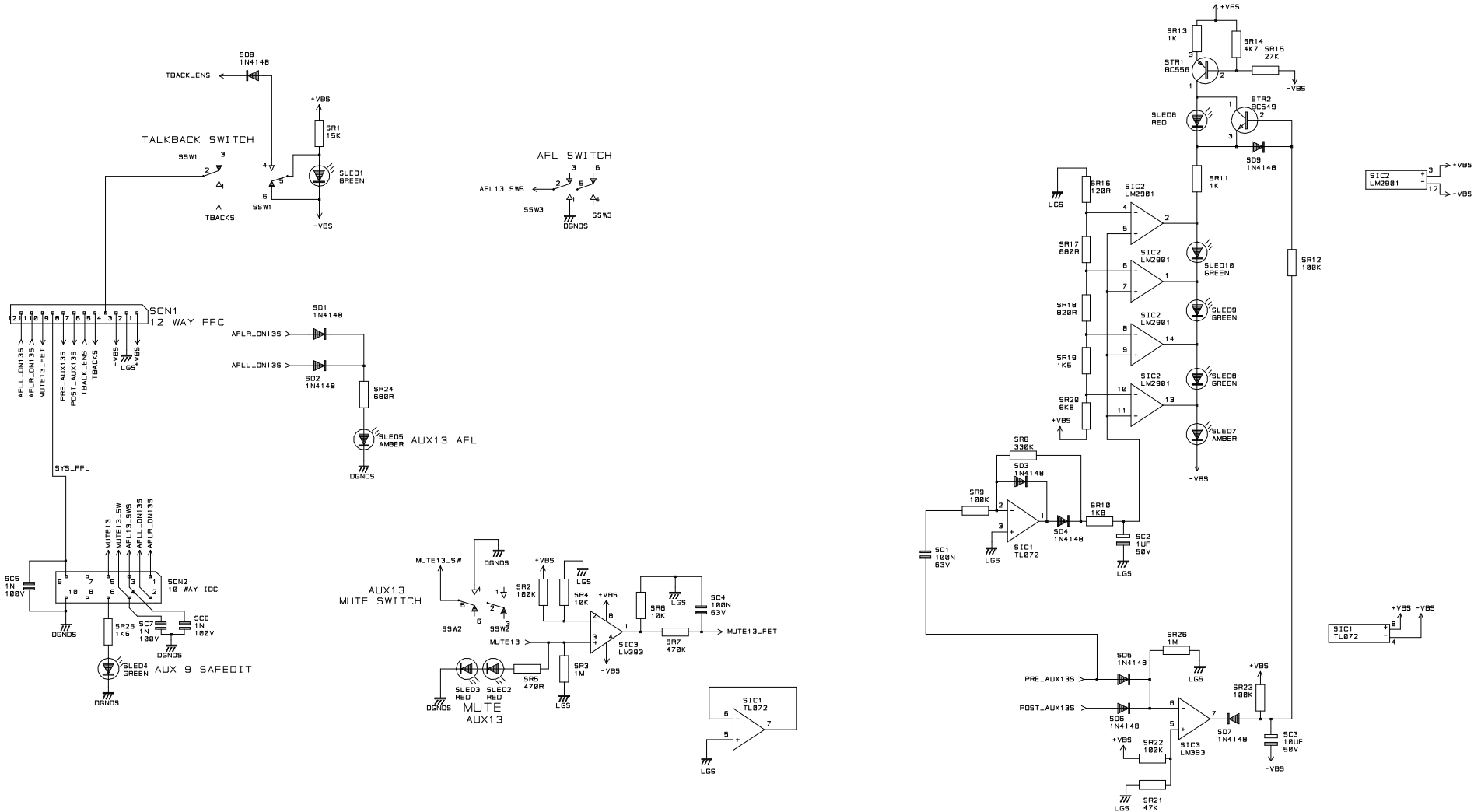
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 CORNWALL  
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TITLE  
 ML5000  
 AUX 14 PCB

DRG NO. 3829

SHT. 2 OF 4

INITIAL	ISSUE	DATE
MG	4	15-8-00



D49

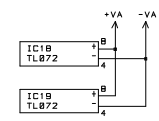
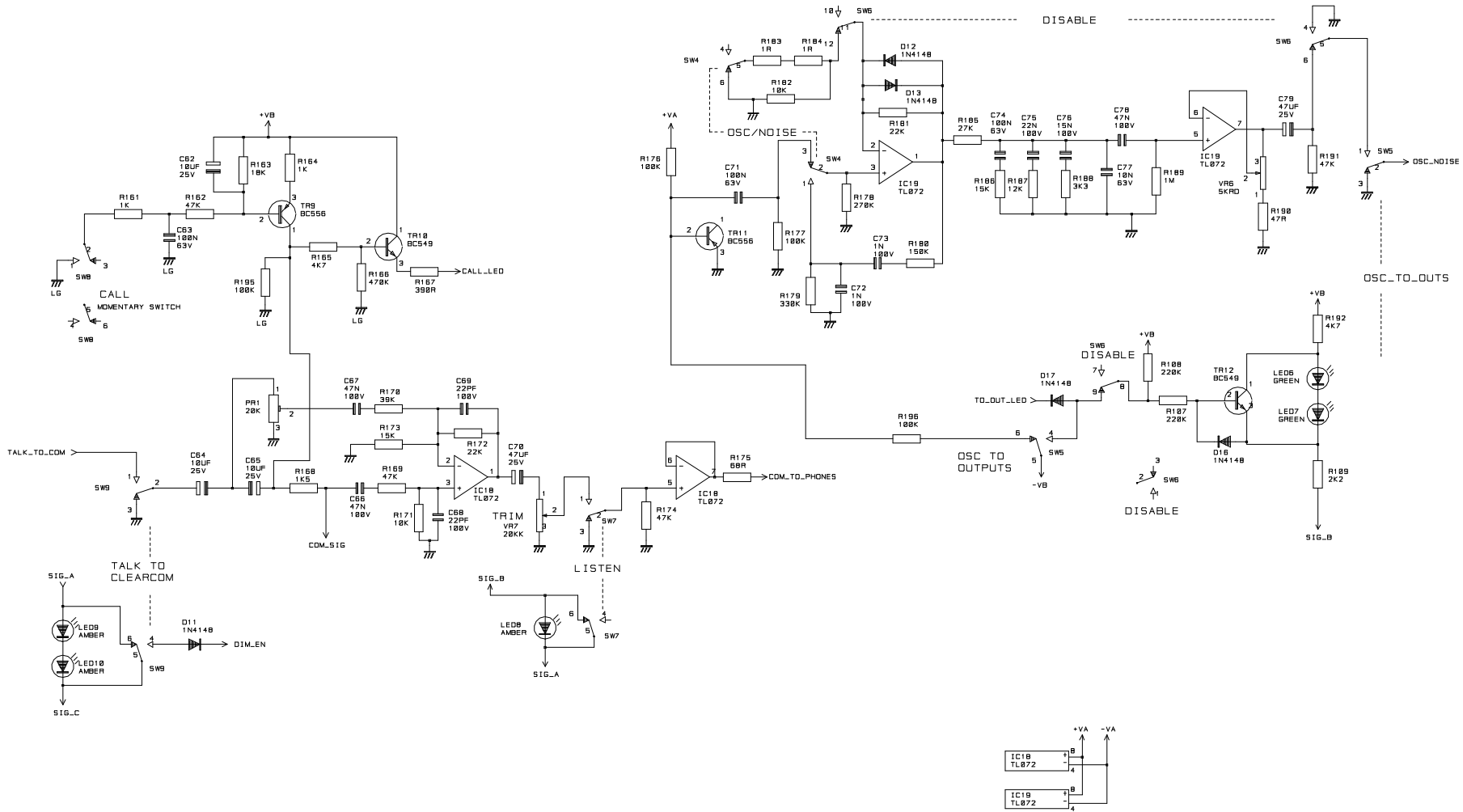
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TITLE  
 ML5000  
 AUX 14 PCB  
 DRG NO. 3829



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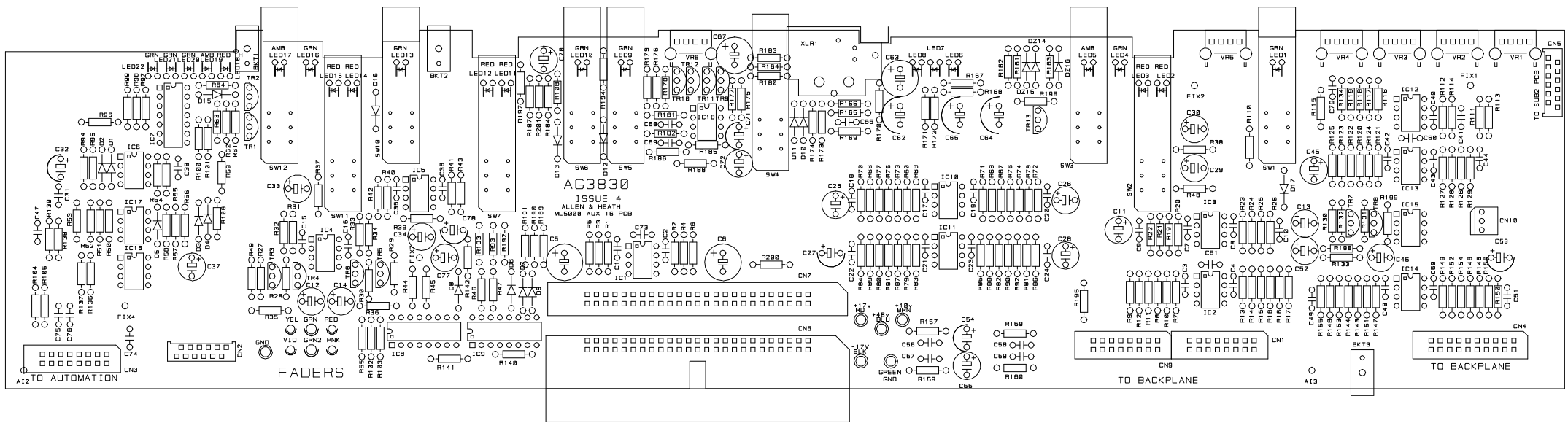


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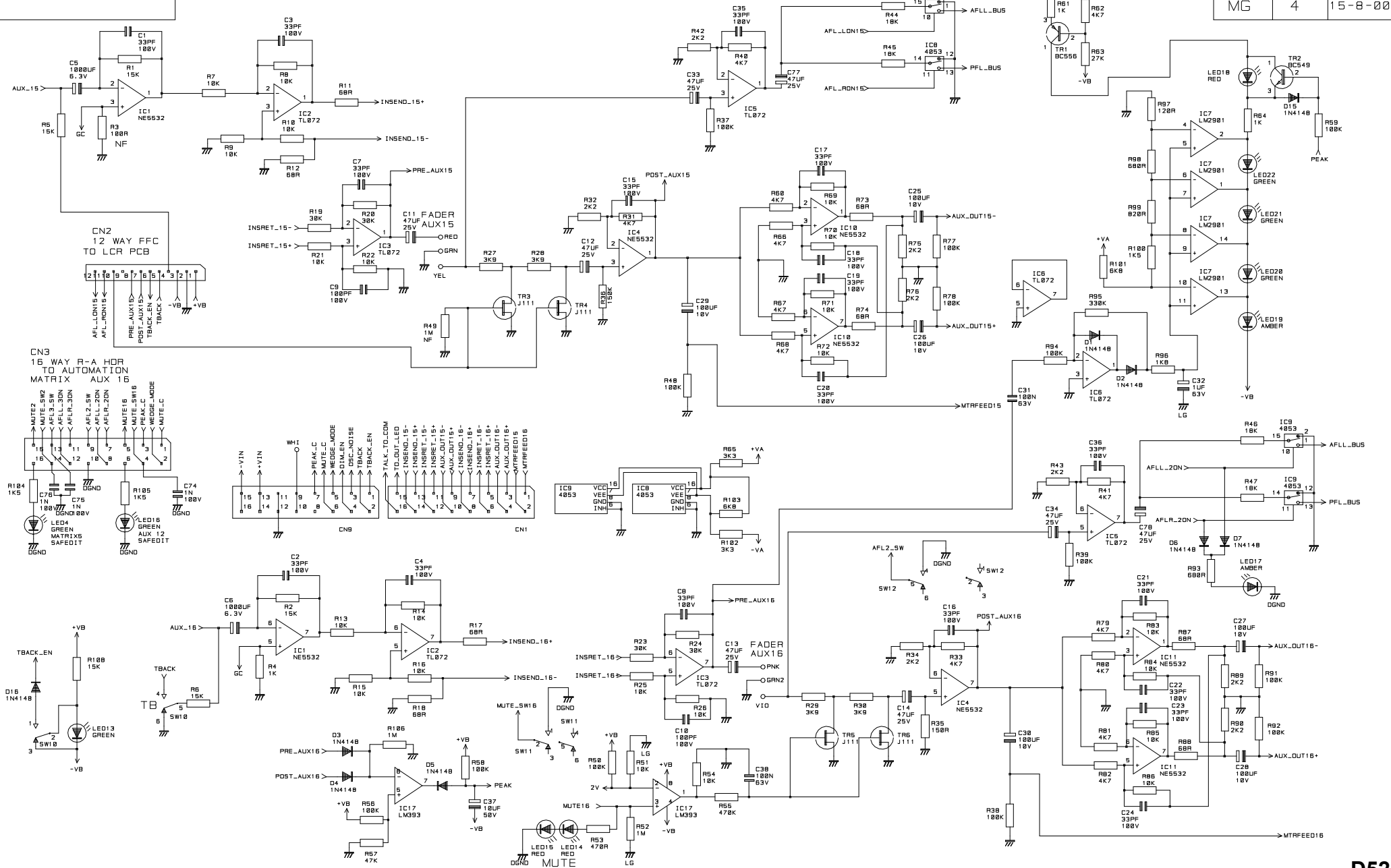
ALLEN & HEATH  
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 CORNWALL  
 TR10 9LU  
 TEL: 01326 372070  
 FAX: 01326 377097

TITLE  
 ML5000  
 AUX 14 PCB

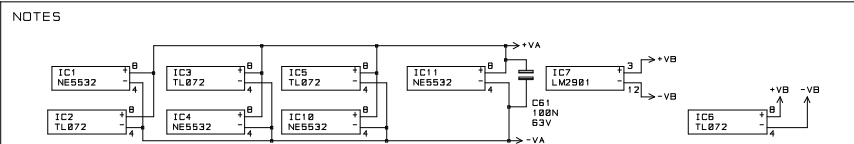
DRG NO. 3829



INITIAL	ISSUE	DATE
MG	4	15-8-00

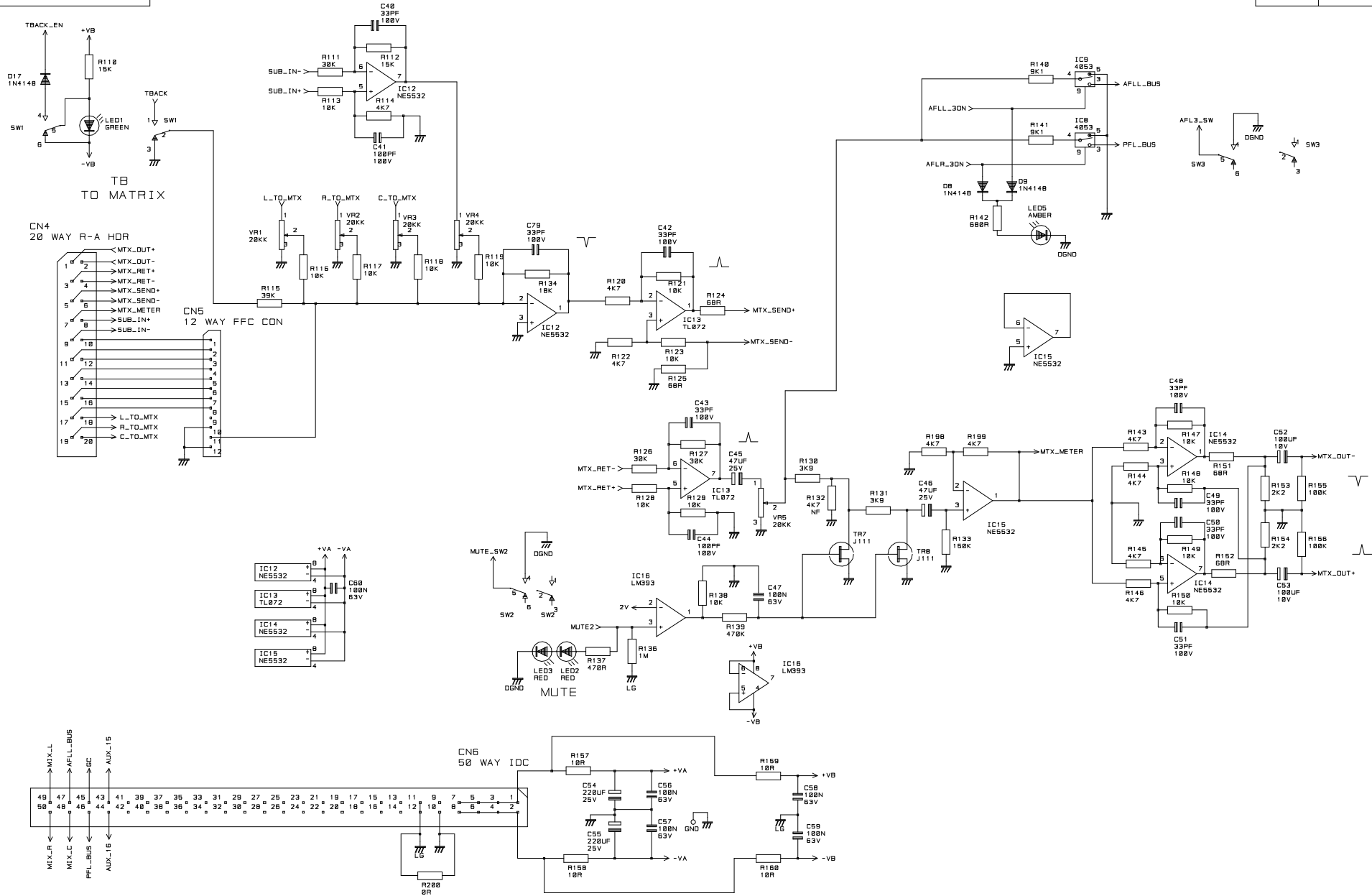


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 CORNWALL  
 TR10 9LU  
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TITLE  
 ML5000  
 AUX 16 PCB  
 DRG NO. 3830  
 SHT. 1 OF 3



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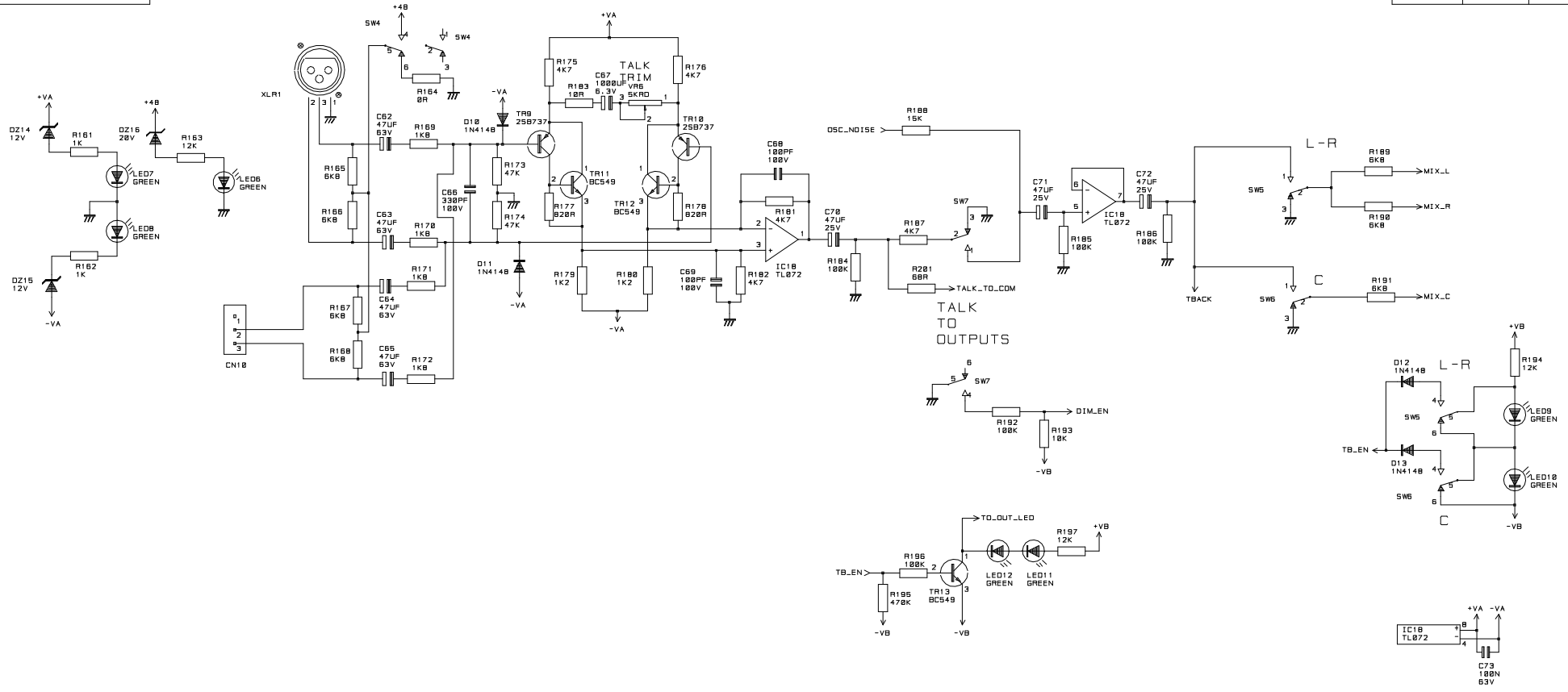
NOTES



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TITLE  
 ML5000  
 AUX 16 PCB  
 DRG NO. 3830



D54

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NOTES

VR6  
 5KRD

DRN. MG

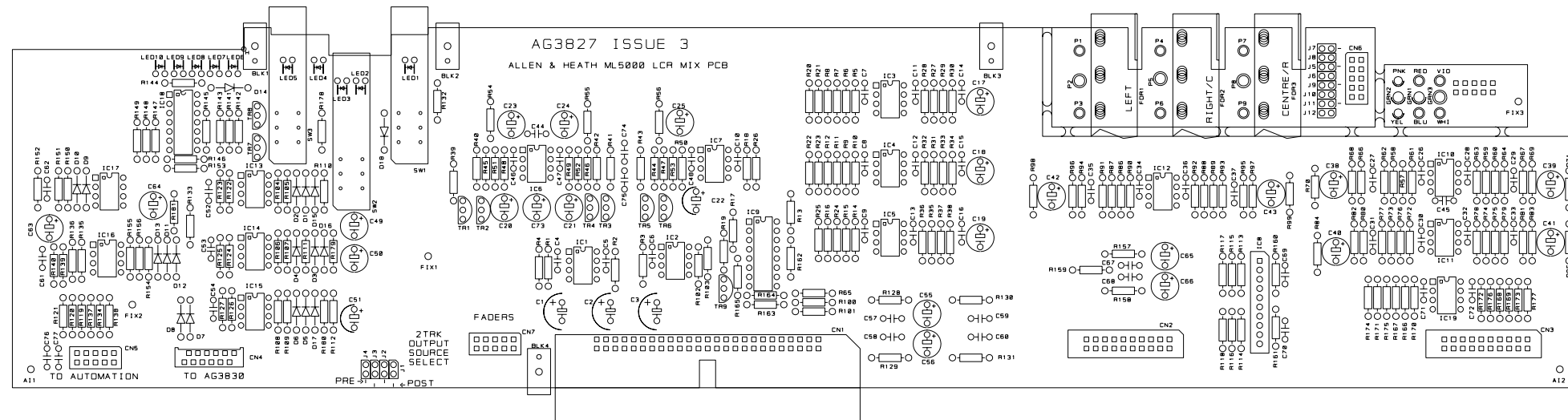
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 PENRYN  
 CORNWALL  
 TR10 9LU  
 TEL: 01326 372070  
 FAX: 01326 377097

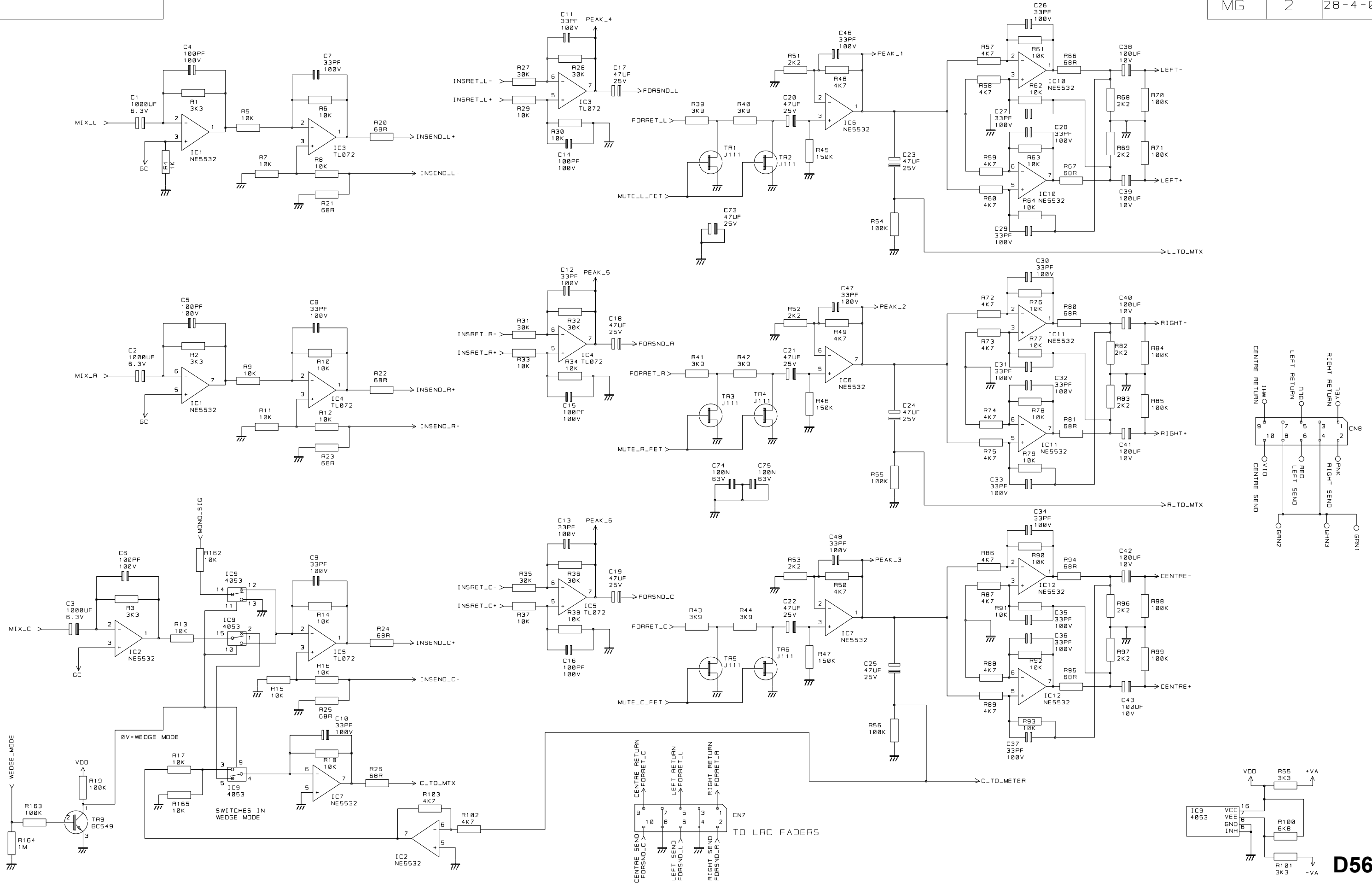
TITLE  
 ML5000  
 AUX 16 PCB

DRG NO. 3830

SHT. 3 OF 3

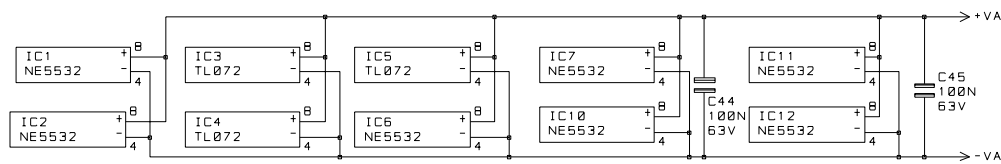






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NOTES



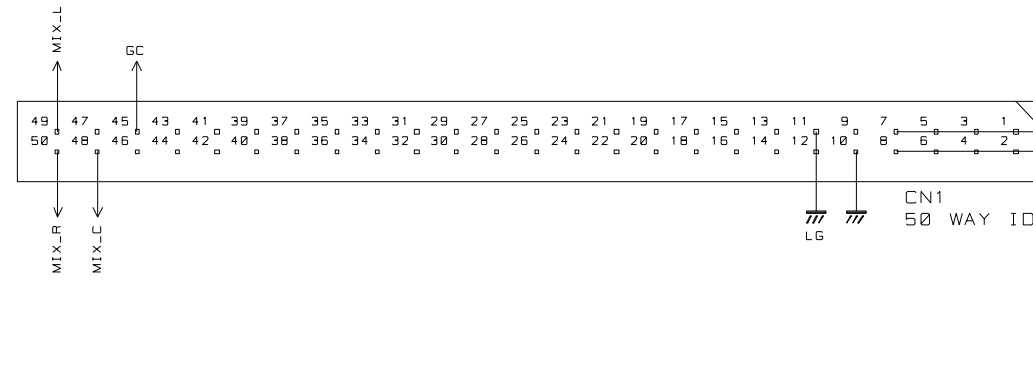
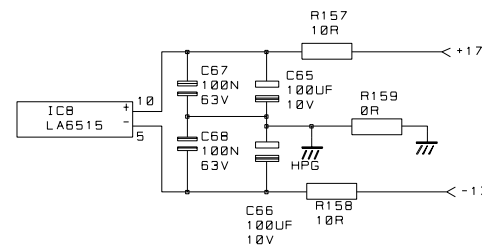
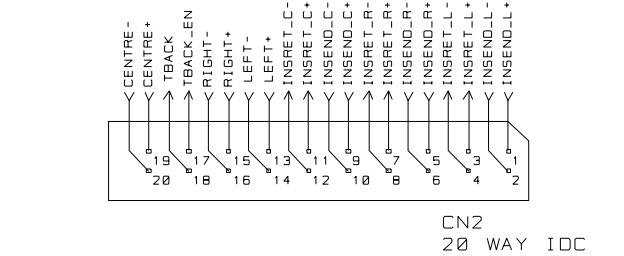
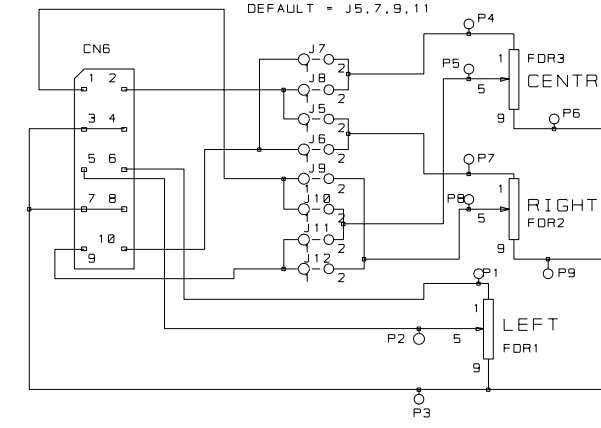
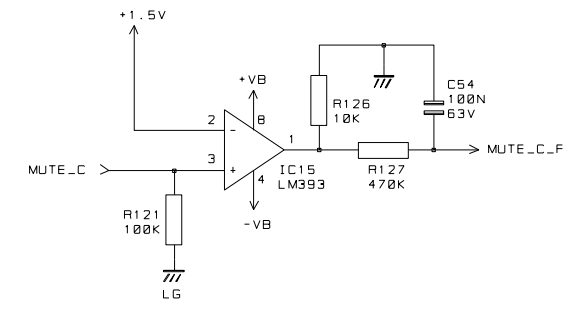
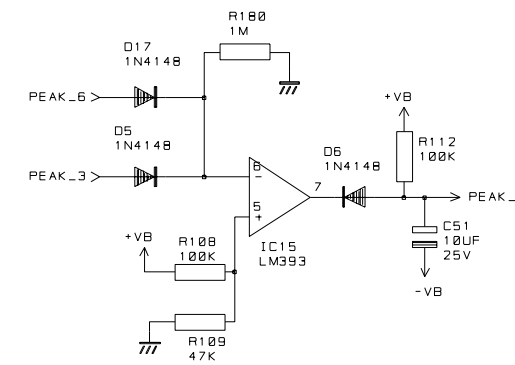
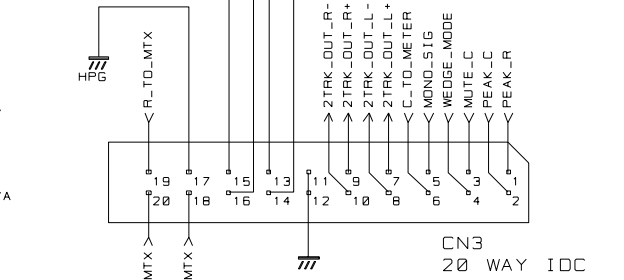
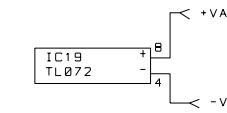
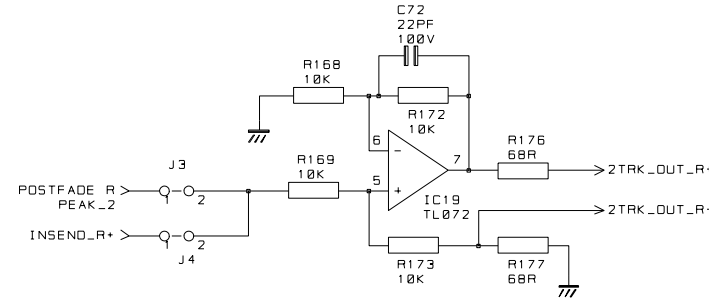
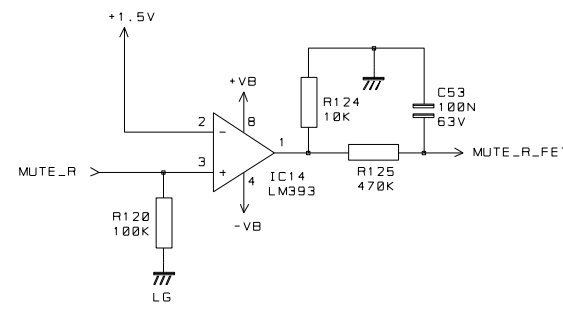
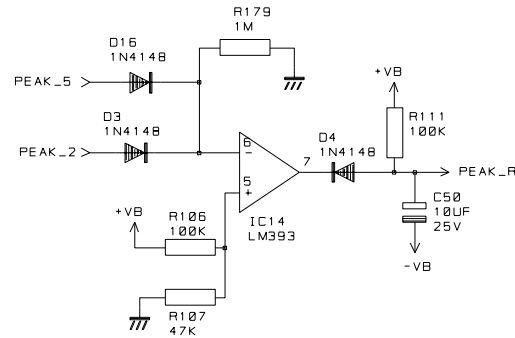
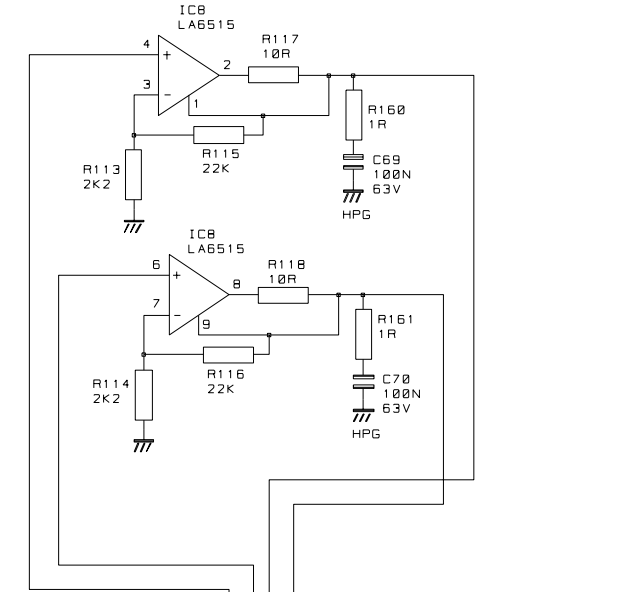
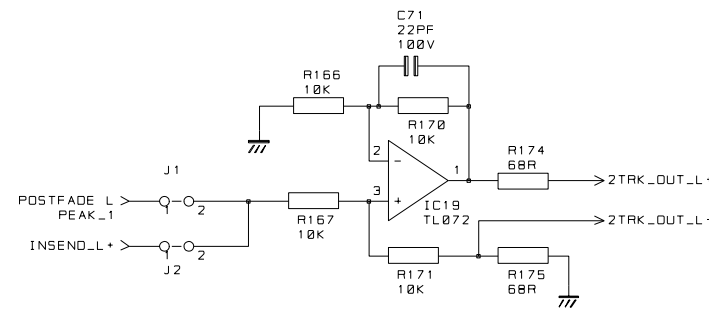
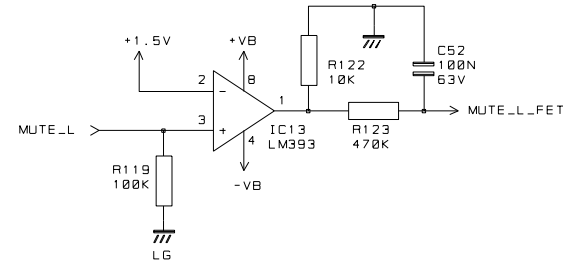
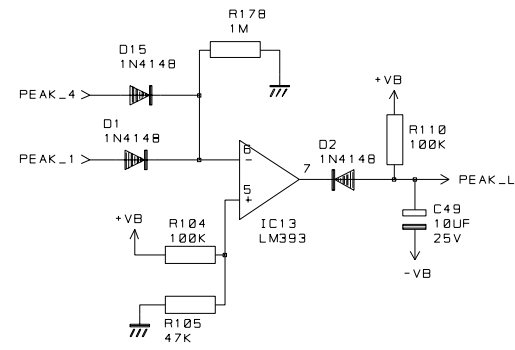
DRN. MG

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TITLE  
 ML5000  
 MIX LRC PCB

DRG NO. 3827

D56



**D57**

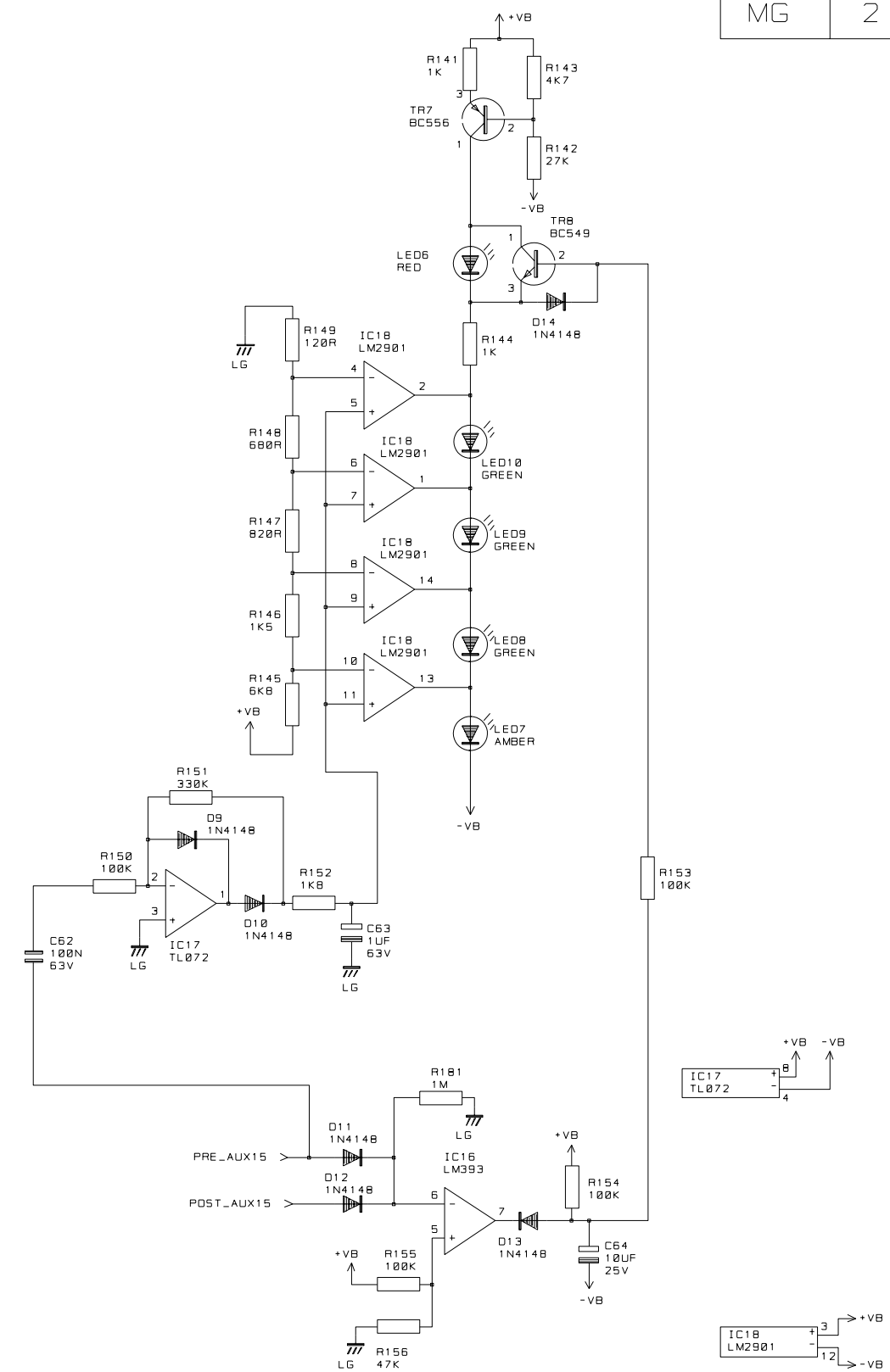
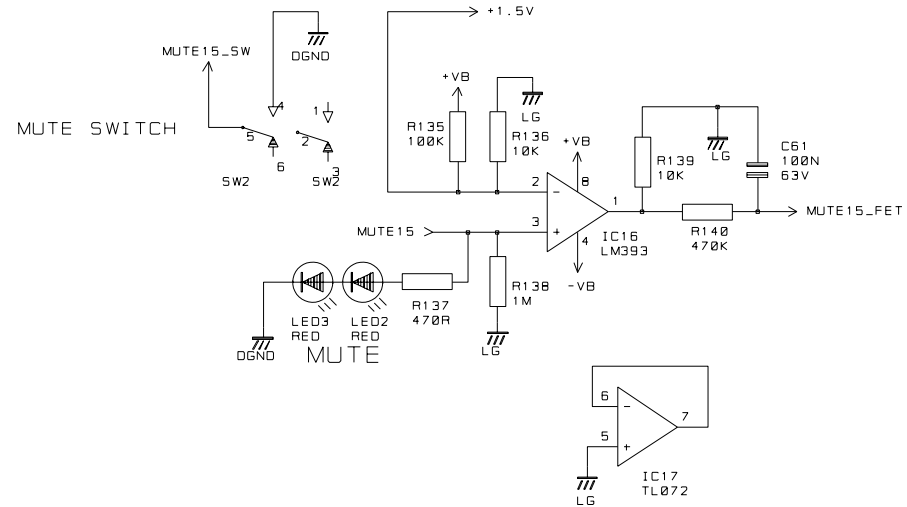
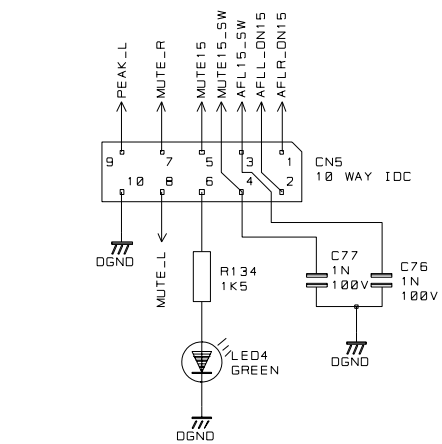
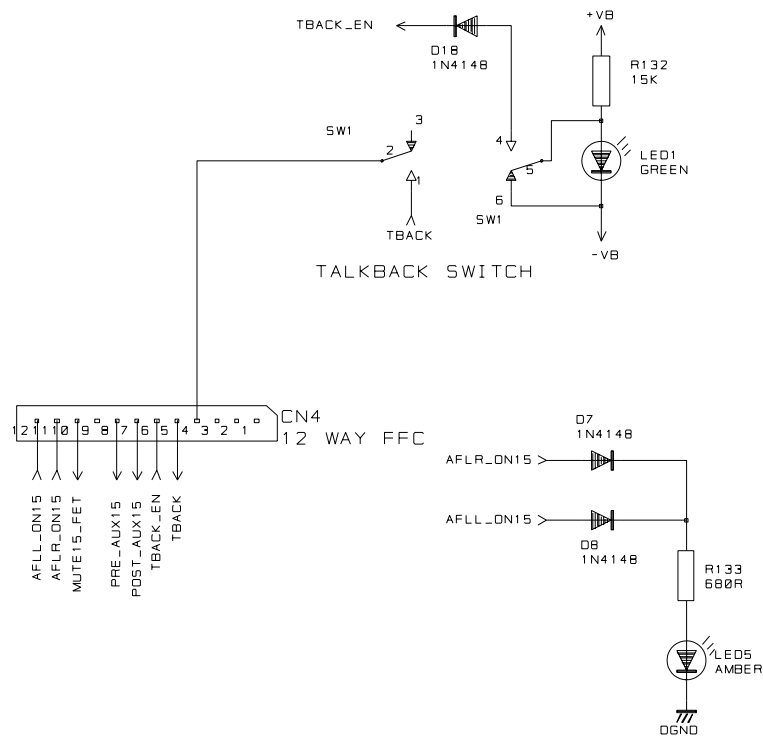
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TITLE  
 ML5000  
 MIX LRC PCB  
 DRG NO. 3827



D58

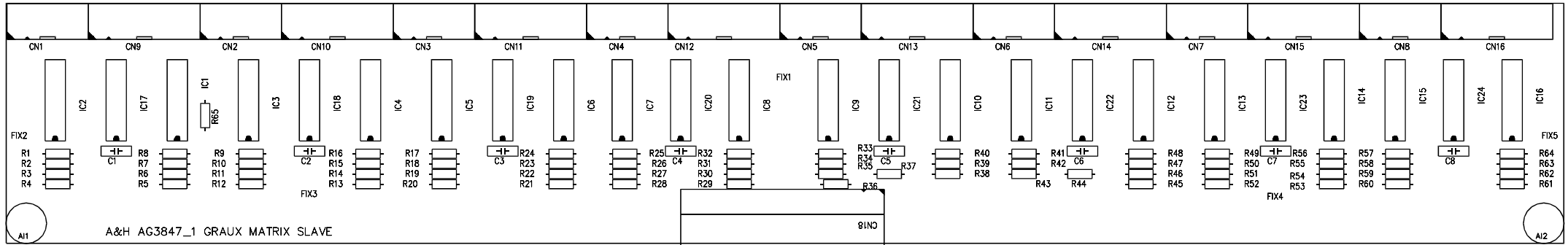
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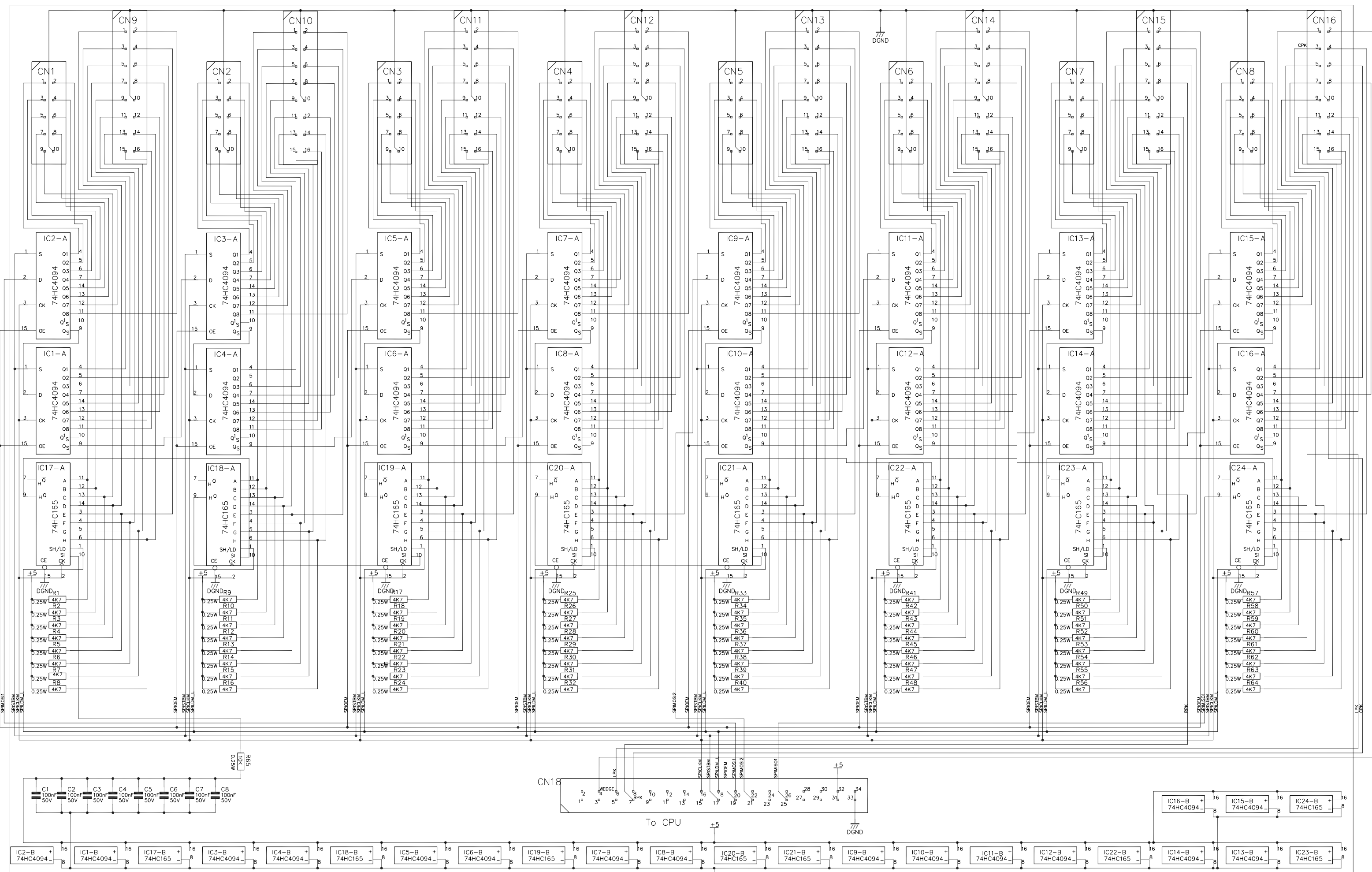
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DRN. MG

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TITLE  
 ML5000  
 LRC PCB  
 DRG NO. 3827





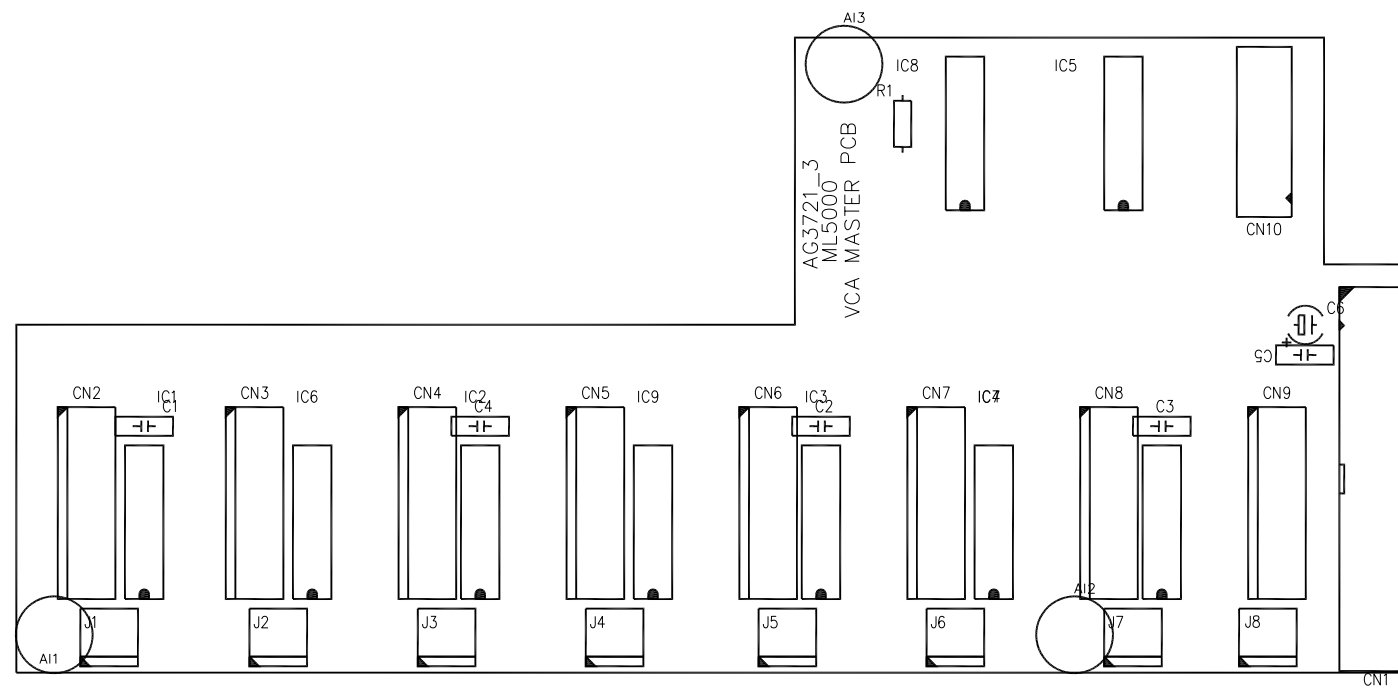
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A	ORIGIN	GMR	2/8/99
B	CONNECTOR CHANGES	AAT	27/09/99
1	GROUND PLANE PCB (DGND)	AAT	02-12-99

NOTES

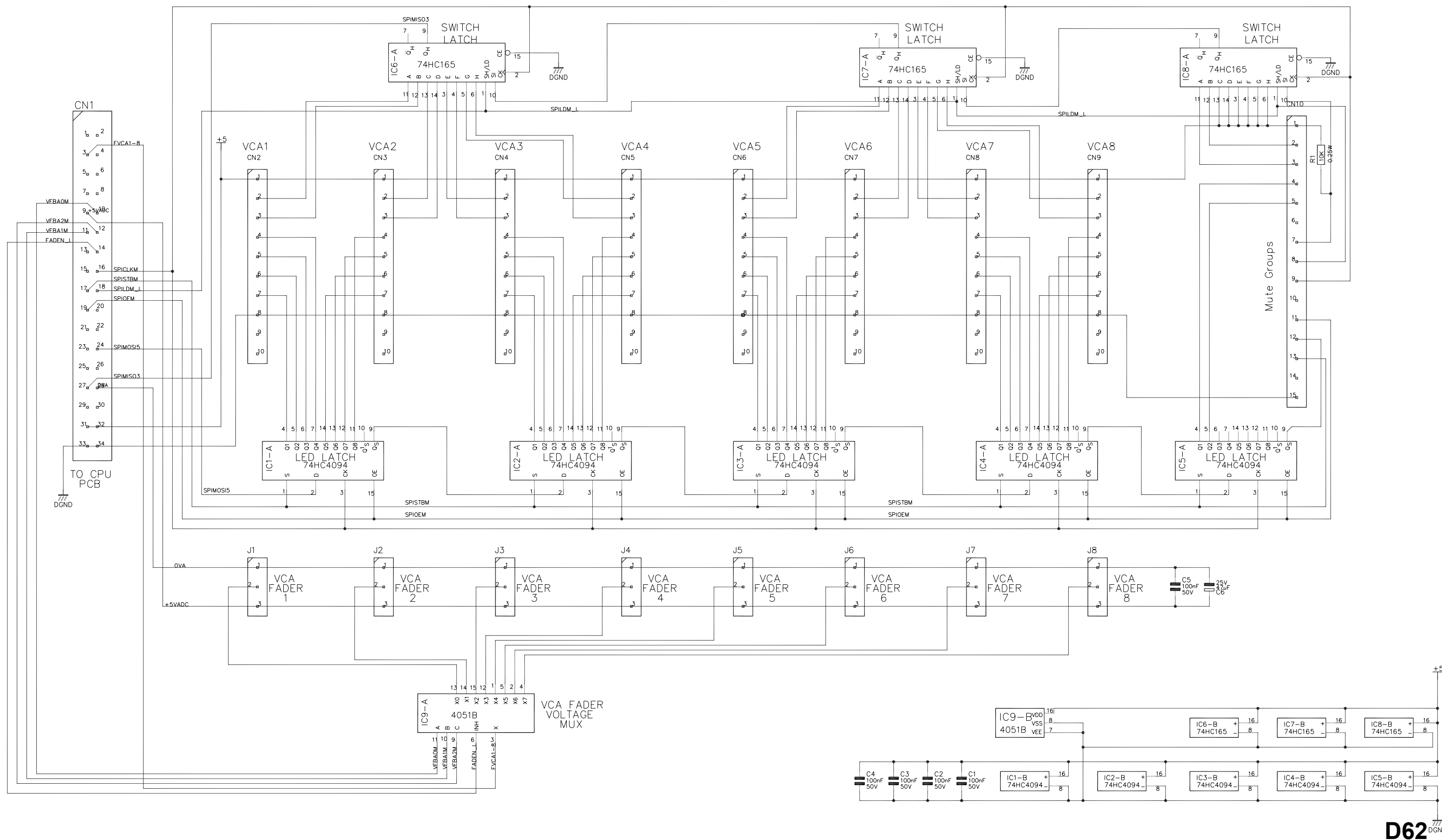
1. RESISTORS MARKED \* ARE 1% ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
2. ELECTROLYTIC CAPACITORS ARE  $\mu\text{F}/\text{VOLTS}$
- 3.

UNIT TITLE ML5000  
 DRAWING TITLE Graux Matrix Slave  
 CIRCUIT DIAGRAM PCB AG 3847

ALLEN & HEATH **D60**  
 PENRYN, CORNWALL  
 ENGLAND, TR10 9LU  
 DRAWING No 3847 SHT 1 OF 1 ISSUE 1 A1



D61



**D62** DGND

ISS	REVISION	BY	DATE
A	ORIGIN	GMR	11/8/99
B	IDC CHG + OTHER	AAT	13/10/99
1	GROUND PLANE ADDED TO PCB MOUNT	AAT	03-12-99
2	FADER CONN WIRING	AAT	28-02-00
3	PROFILE CHANGE FOR ML4000 FIT	AAT	20-11-00

NOTES  
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 ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED  
 2. ELECTROLYTIC CAPACITORS ARE  $\mu$ F/VOLTS  
 3.

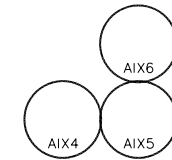
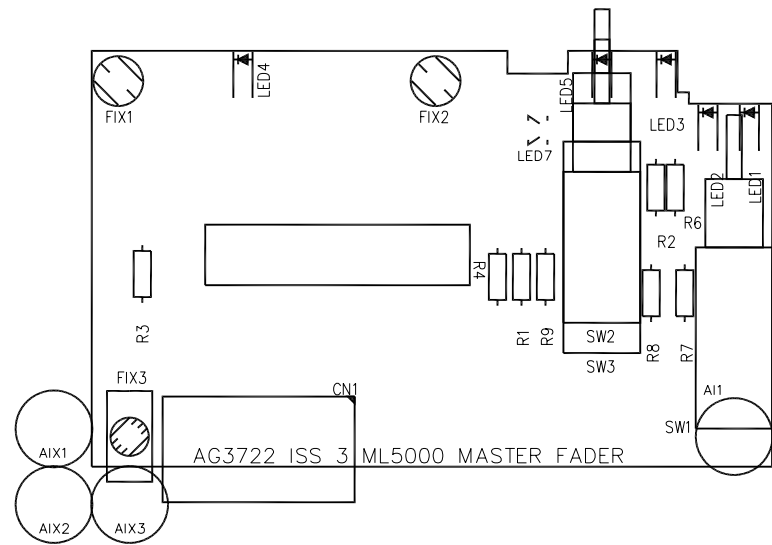
UNIT TITLE  
 ML5000  
 DRAWING TITLE  
 VCA masters slave  
 CIRCUIT DIAGRAM PCB AG 3721

ALLEN & HEATH  
 PENRYN, CORNWALL  
 ENGLAND, TR10 9LU  
 DRAWING No 3721 SHT 1 of 1 ISSUE 3 A1

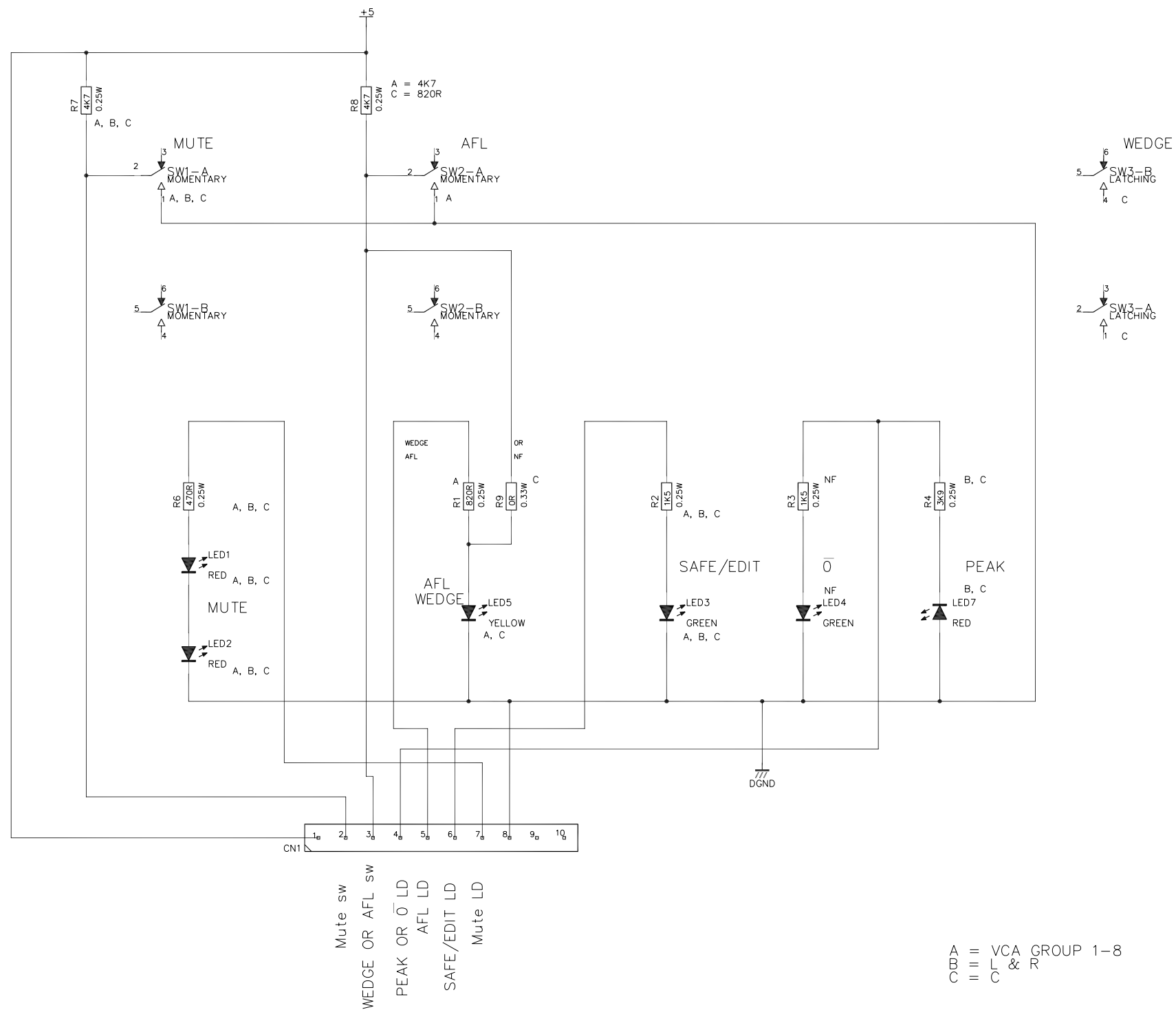




# ALLEN & HEATH ML5000 FADER PCB AG3722\_3



AG3722 ISS 3 TOP SILK 30-05-00

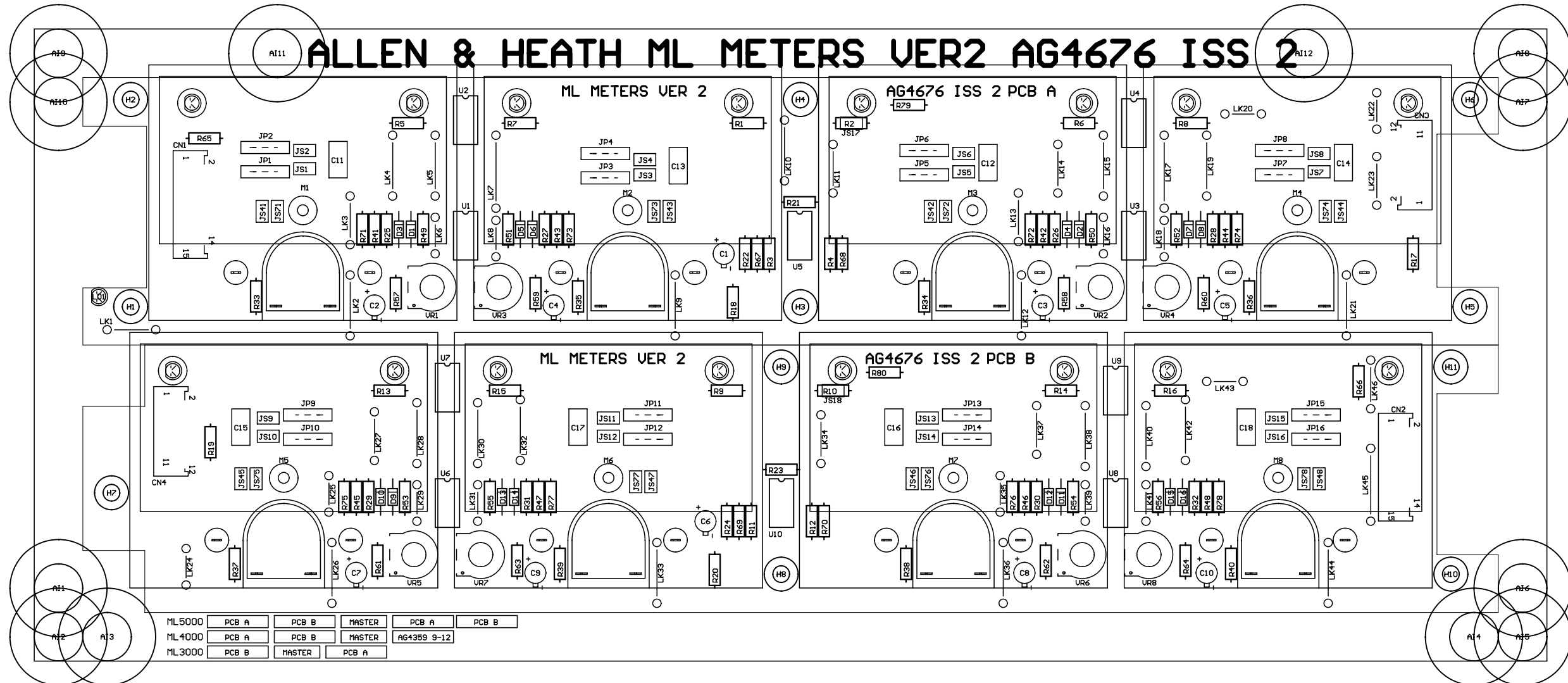


**D64**

ISS	REVISION	BY	DATE	NOTES	UNIT TITLE	DRAWING No		
A	ORIGIN	GMR	30/7/99	1. RESISTORS MARKED * ARE 1% ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED 2. ELECTROLYTIC CAPACITORS ARE $\mu$ F/VOLTS 3.	ML5000	DRAWING No 3722 SHT 1 of 1		
1	SWAP PINS 4,7 ON CN1 GROUND PLANE ADDED (DGND) TO MOUNTINGS	AAT	04-11-99		CIRCUIT DIAGRAM	ISSUE 3		
2	VALUES / ANNOTATION	AAT	28-02-00		PCB AG 3722	A1		
3	FIXING HOLE ADJUSTMENT	AAT	30-05-00					

ALLEN & HEATH  
PENRYN, CORNWALL  
ENGLAND, TR10 9LU

# ALLEN & HEATH ML METERS VER2 AG4676 ISS 2



ML5000	PCB A	PCB B	MASTER	PCB A	PCB B
ML4000	PCB A	PCB B	MASTER	AG4359 9-12	
ML3000	PCB B	MASTER	PCB A		

D65

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 England, TR10 9LU  
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TOP OVERLAY

.GTO

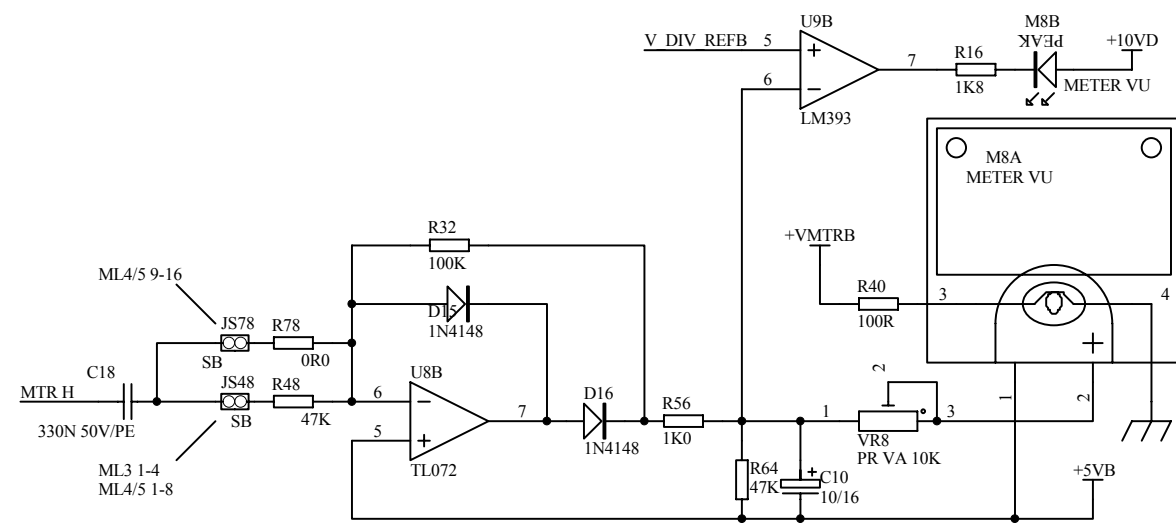
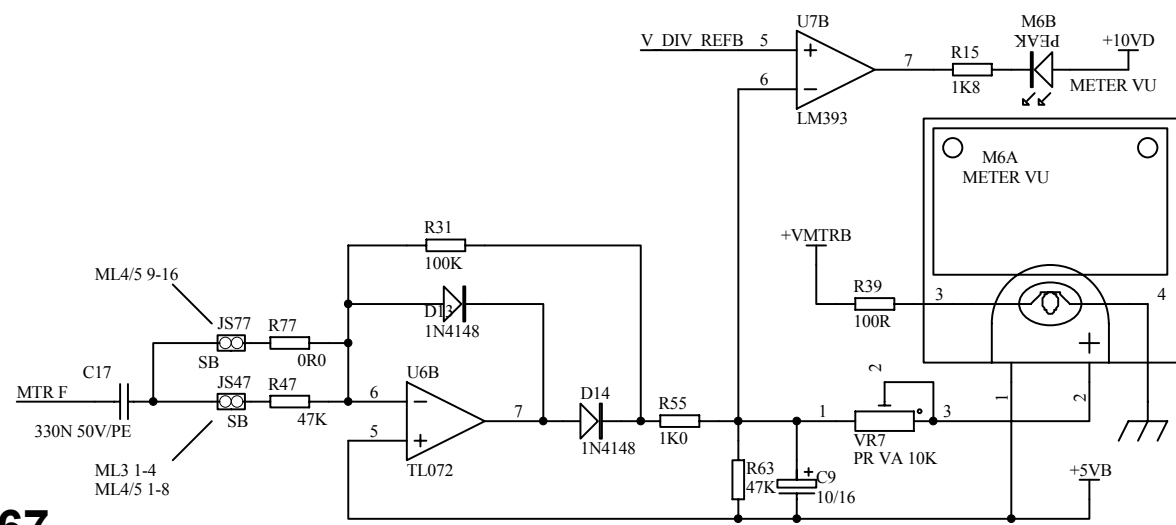
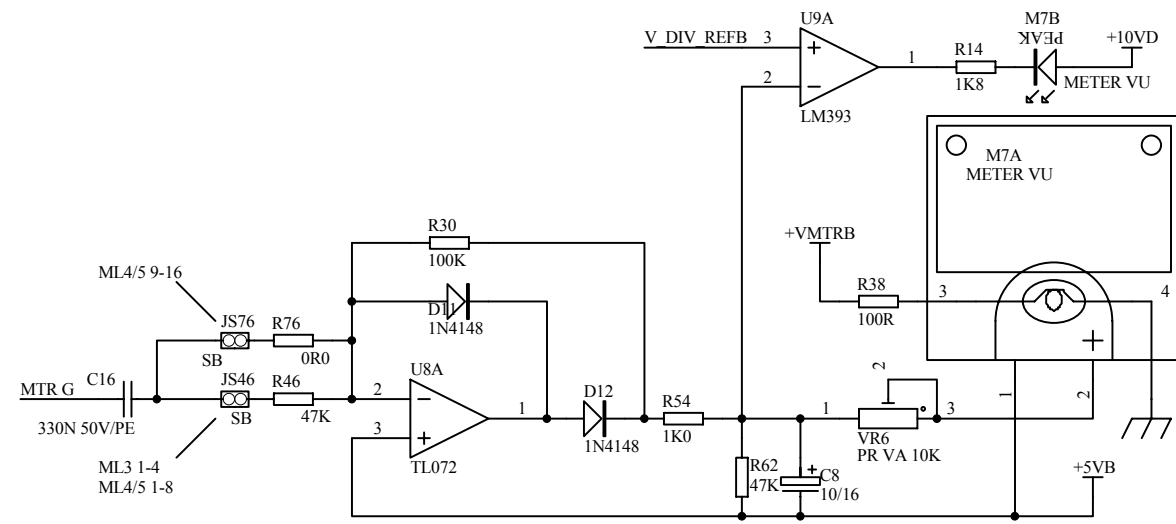
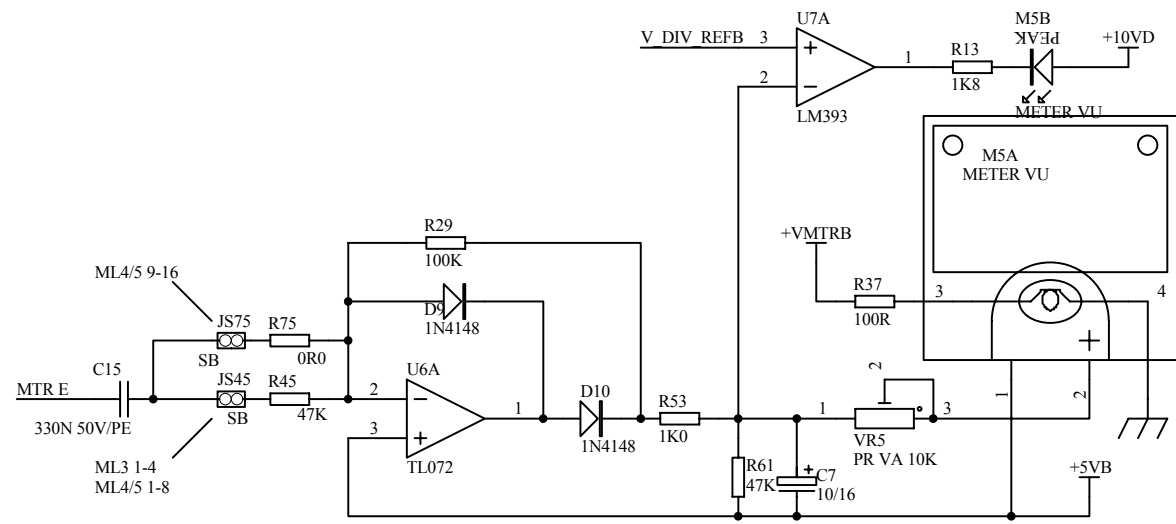
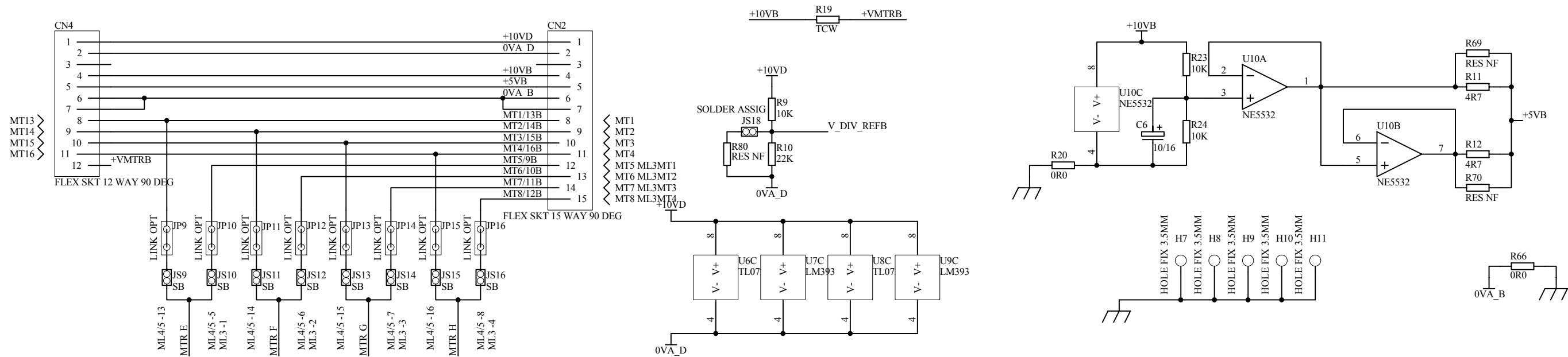
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PRINTED: 18:52:13 6-Dec-2002

TITLE: ML METERS VER2 PCB

DRG No: AG4676 ISSUE: 2



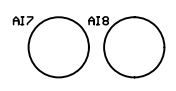
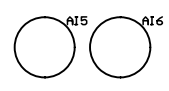
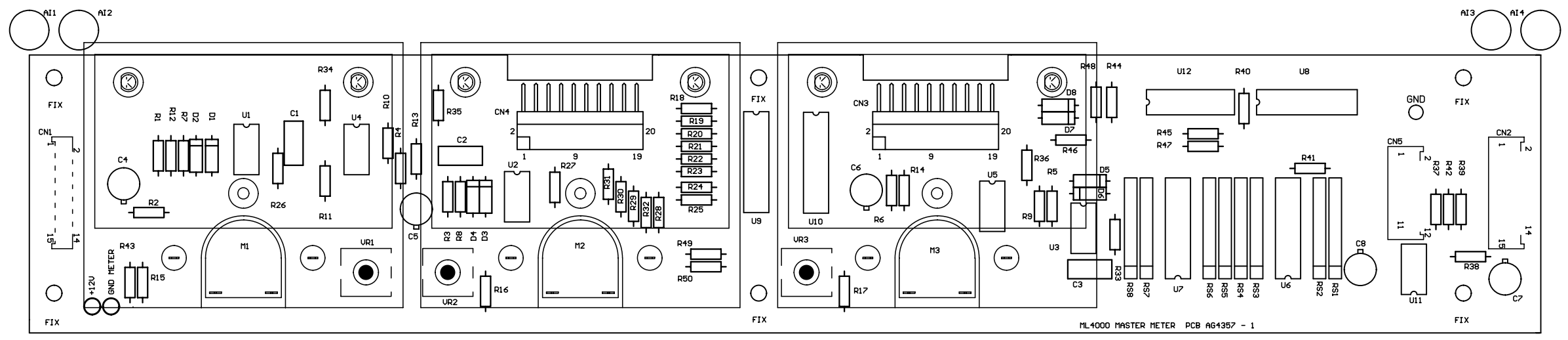


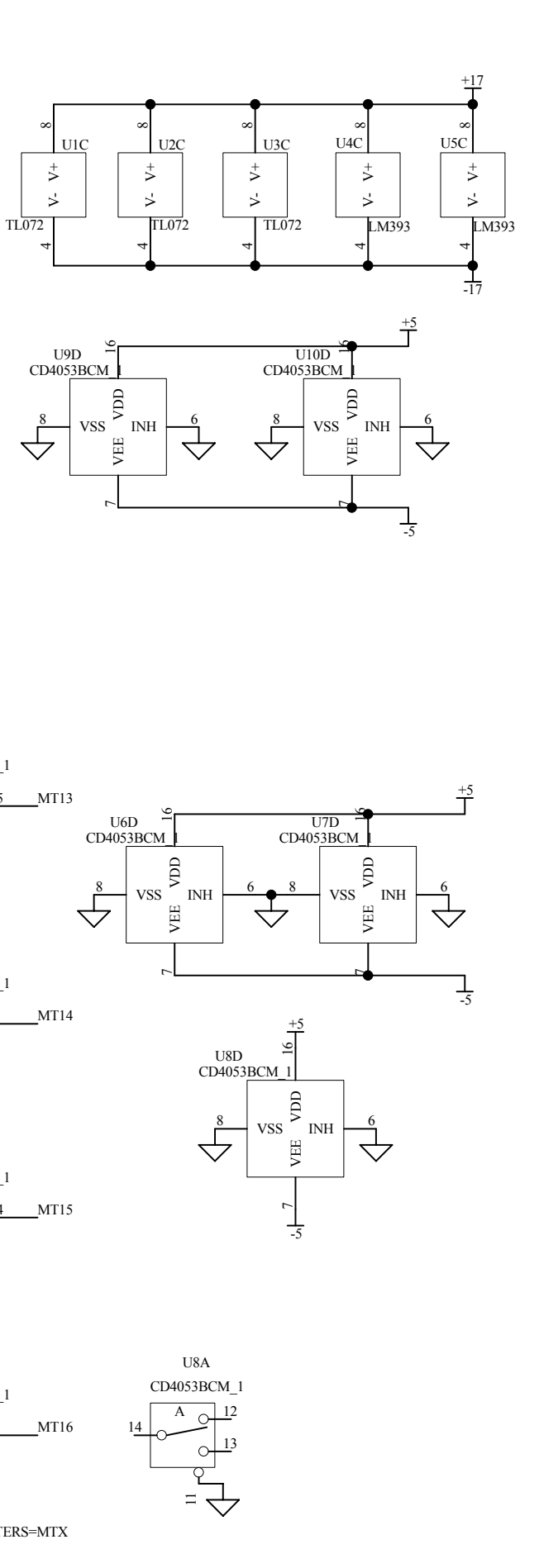
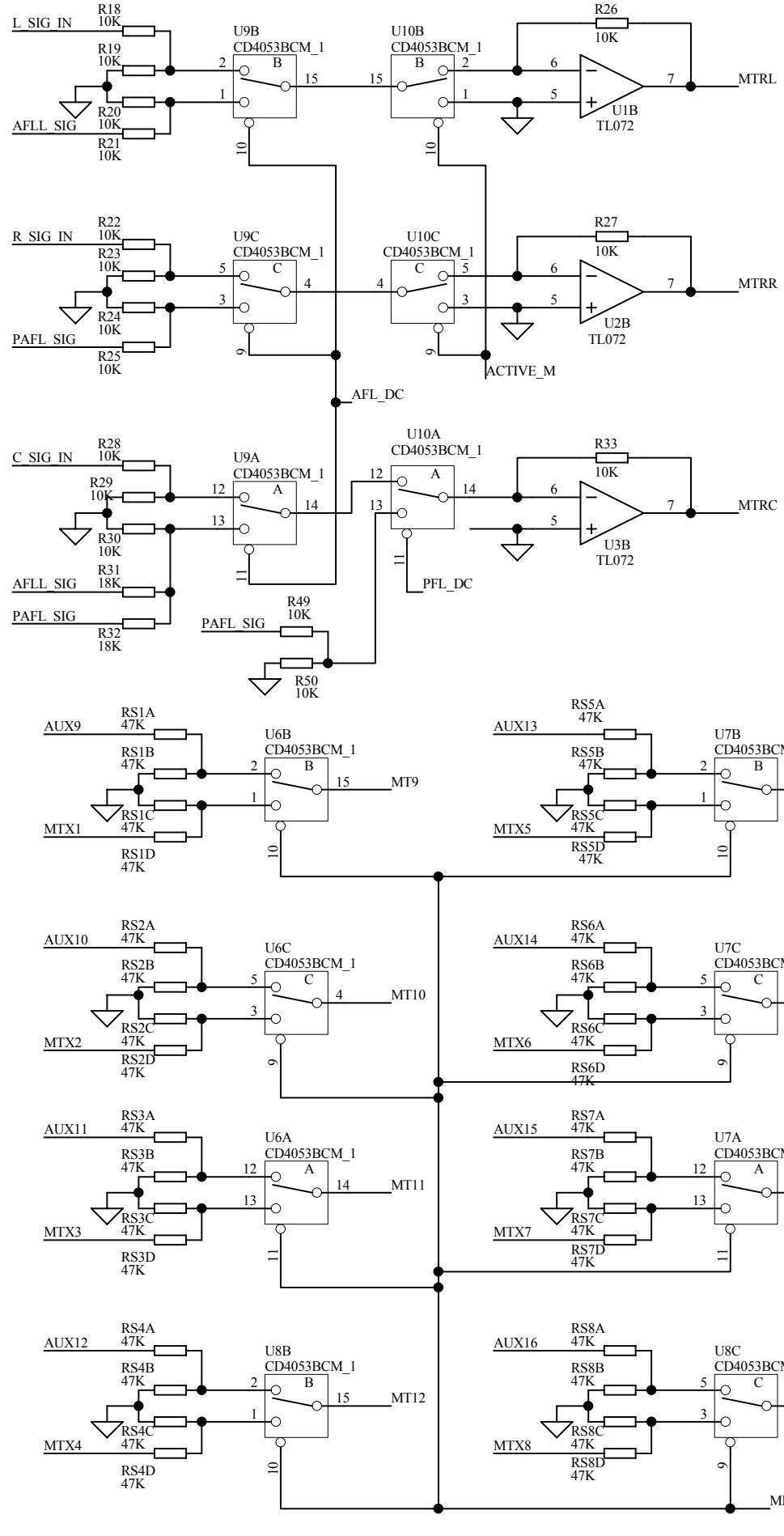
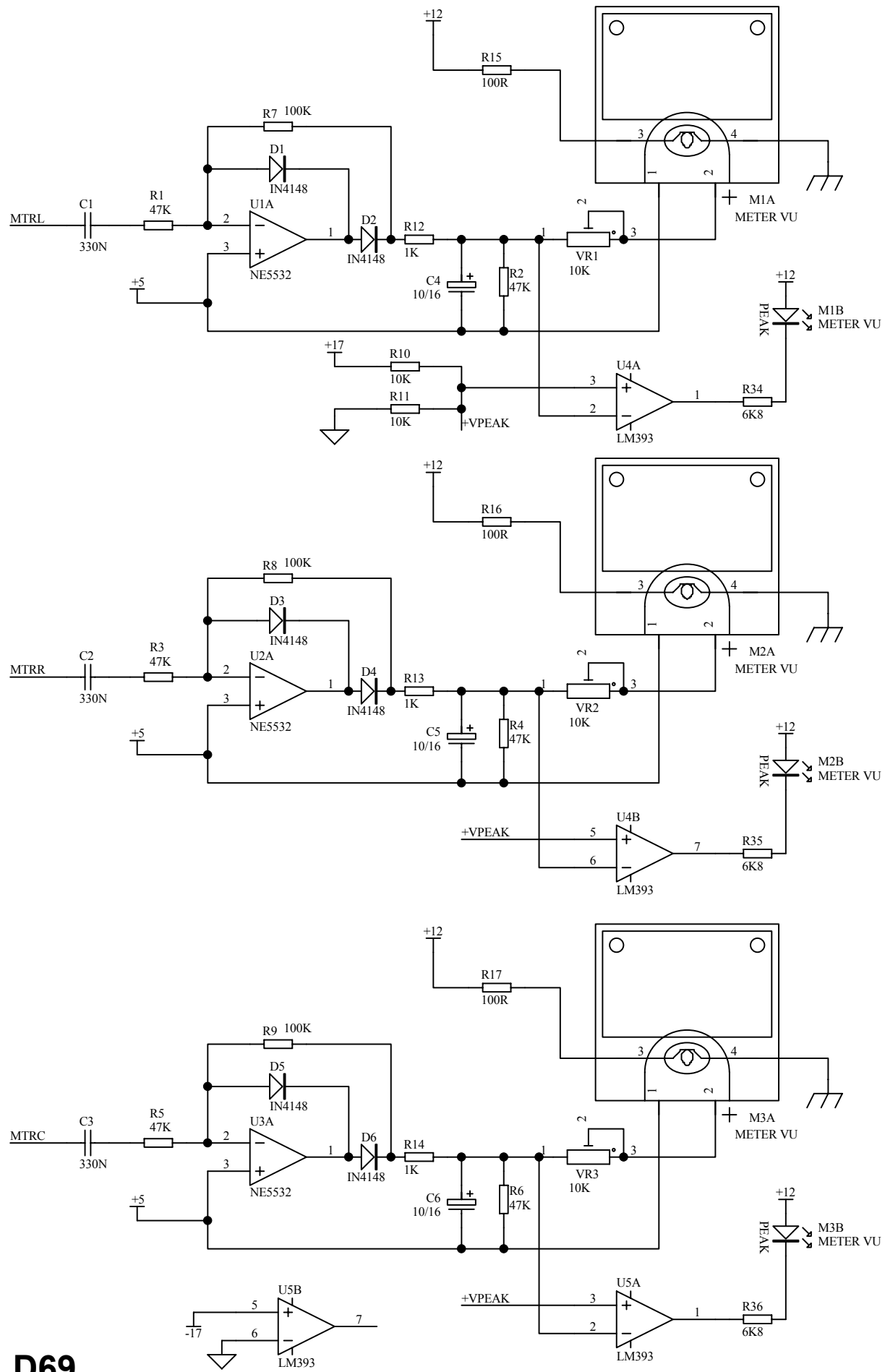
**D67**

ISSUE	BY	DATE	TITLE:	DRG No:	ISSUE:	SHEET:	OF	A3
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2	AAT	30-10-01	METERS 5-8 & 13-16					
FILE: C4676P3_2.Sch			PRINTED: 18:58:37 6-Dec-2002					

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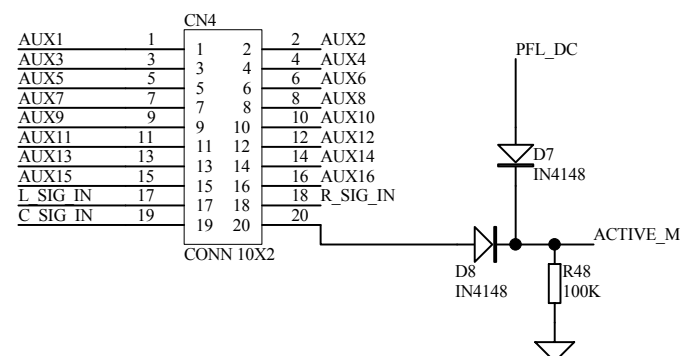
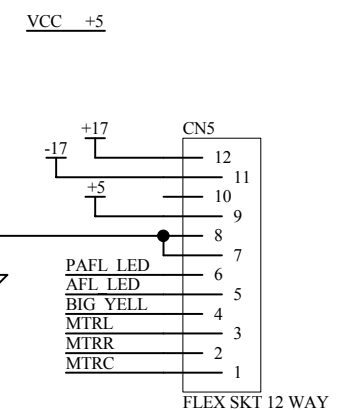
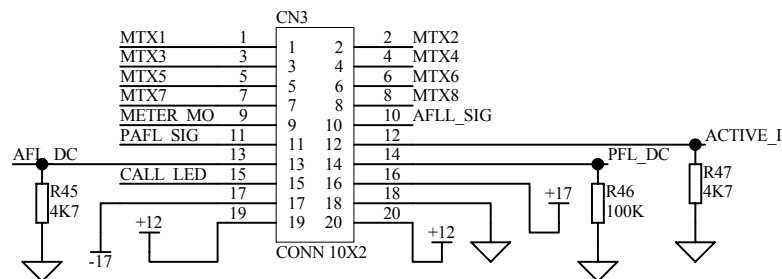
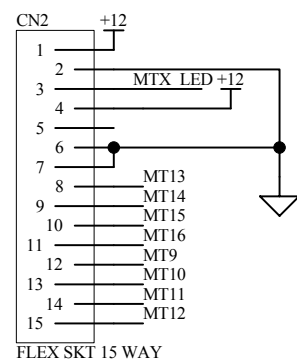
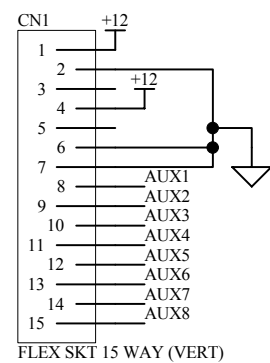
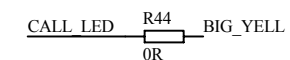
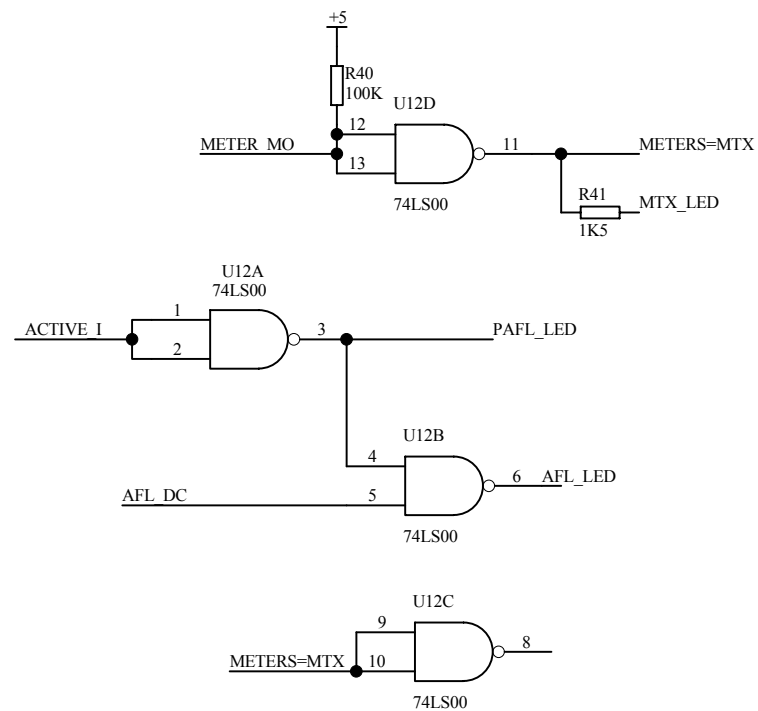
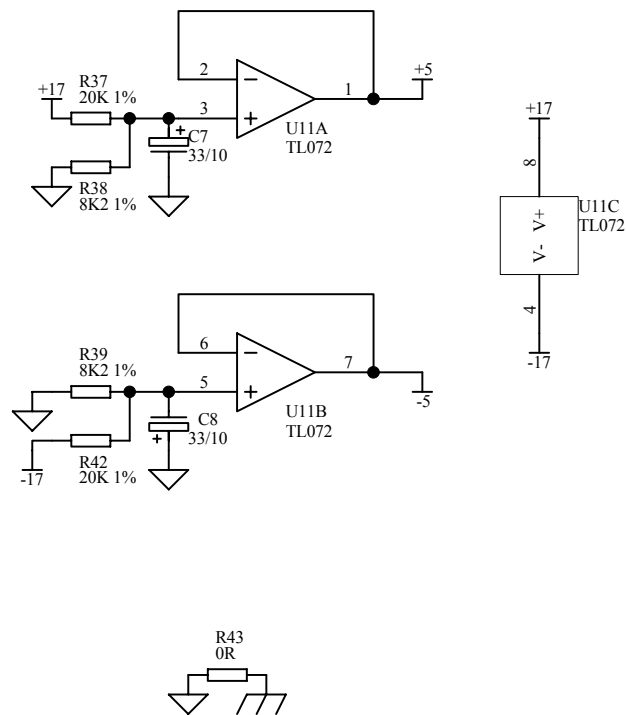


D69

ISSUE	BY	DATE	TITLE: ML MASTER METER PCB
A 1	JB JB	12/01/01 06/02/01	PAGE:
ORIGIN SIL RESISTOR BLOCK MOVED, PADS ADDED, VALUE CHANGES.			DRG No: 4357
FILE: C4357P2_1.Sch			ISSUE: 1
PRINTED:19:02:59 6-Dec-2002			SHEET: 1 OF 2
			A3

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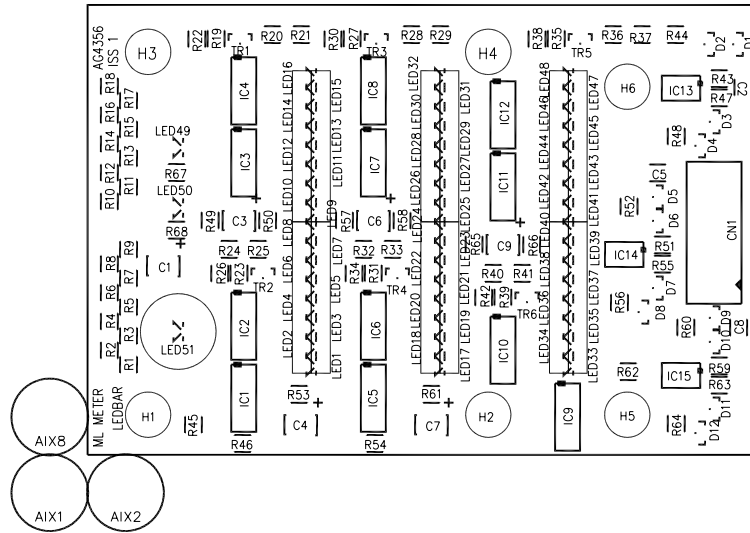
D70

ISSUE	BY	DATE	ORIGIN SIL RESISTOR BLOCK MOVED, PADS ADDED, VALUE CHANGES.	TITLE: ML MASTER METER PCB	ALLEN&HEATH Kernick Industrial Estate, Penryn, Cornwall, England. TR10 9LU Tel: +44 (0)8707 556250 Fax: +44 (0)8707 556251		
A 1	JB JB	12/01/01 06/02/01	FILE: C4357P3_1.Sch	PAGE:	DRG No: 4357	ISSUE: 1	SHEET: 2 OF 2
PRINTED:19:03:51 6-Dec-2002				A3			

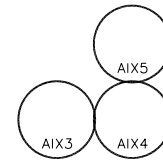
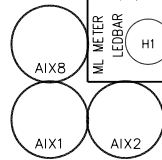


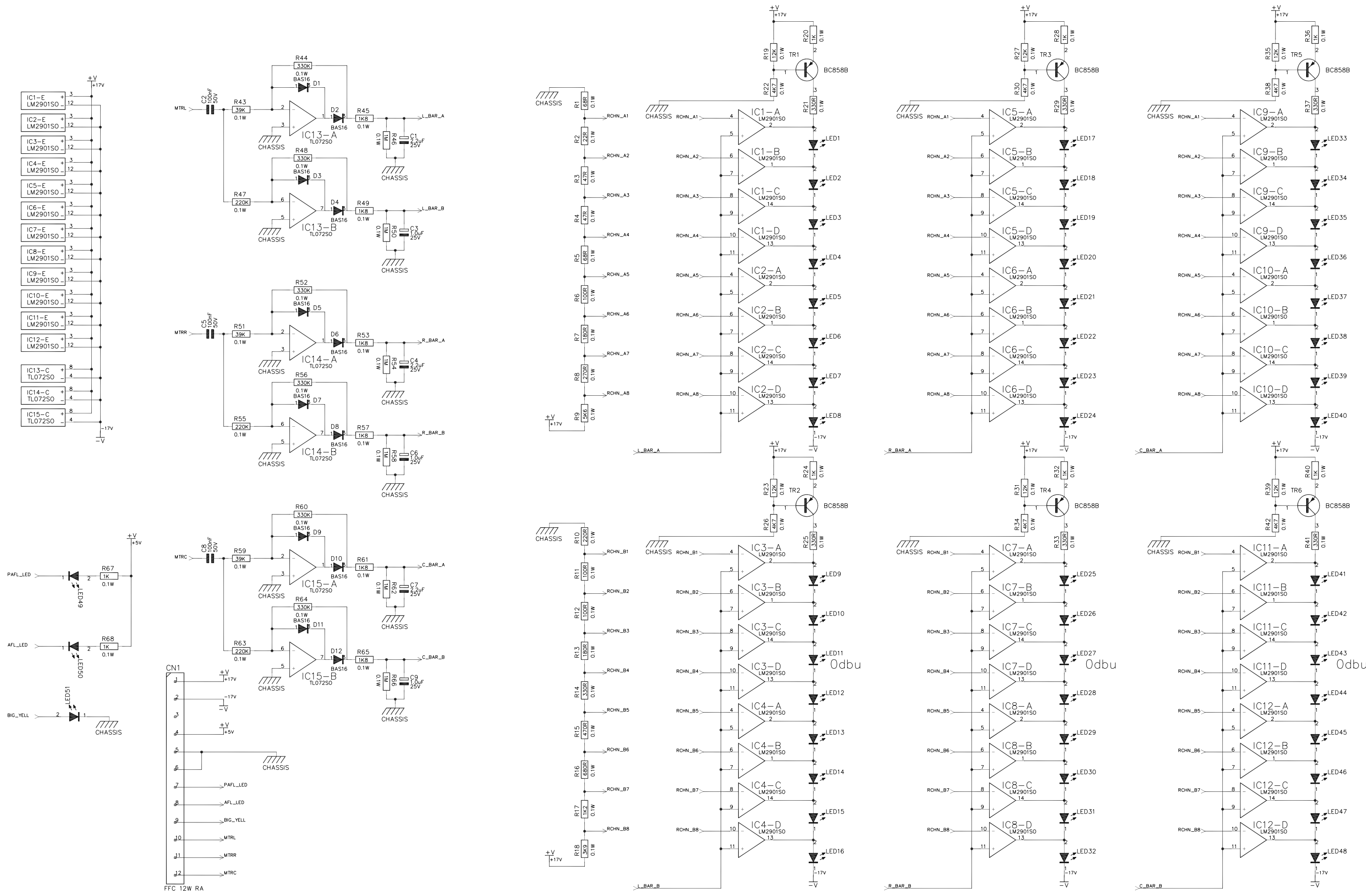


ALLEN & HEATH ML METER LEDBAR PCB AG4356\_1



AG4356 ISS 1 TOP SILK BY AAT 08-02-01





ISS	REVISION	BY	DATE
A	ORIGIN PRODUCTION	AAT	03-01-01
1		AAT	08-02-01

NOTES

1. RESISTORS MARKED \* ARE 1%
2. ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
3. ELECTROLYTIC CAPACITORS ARE  $\mu\text{F}/\text{VOLTS}$

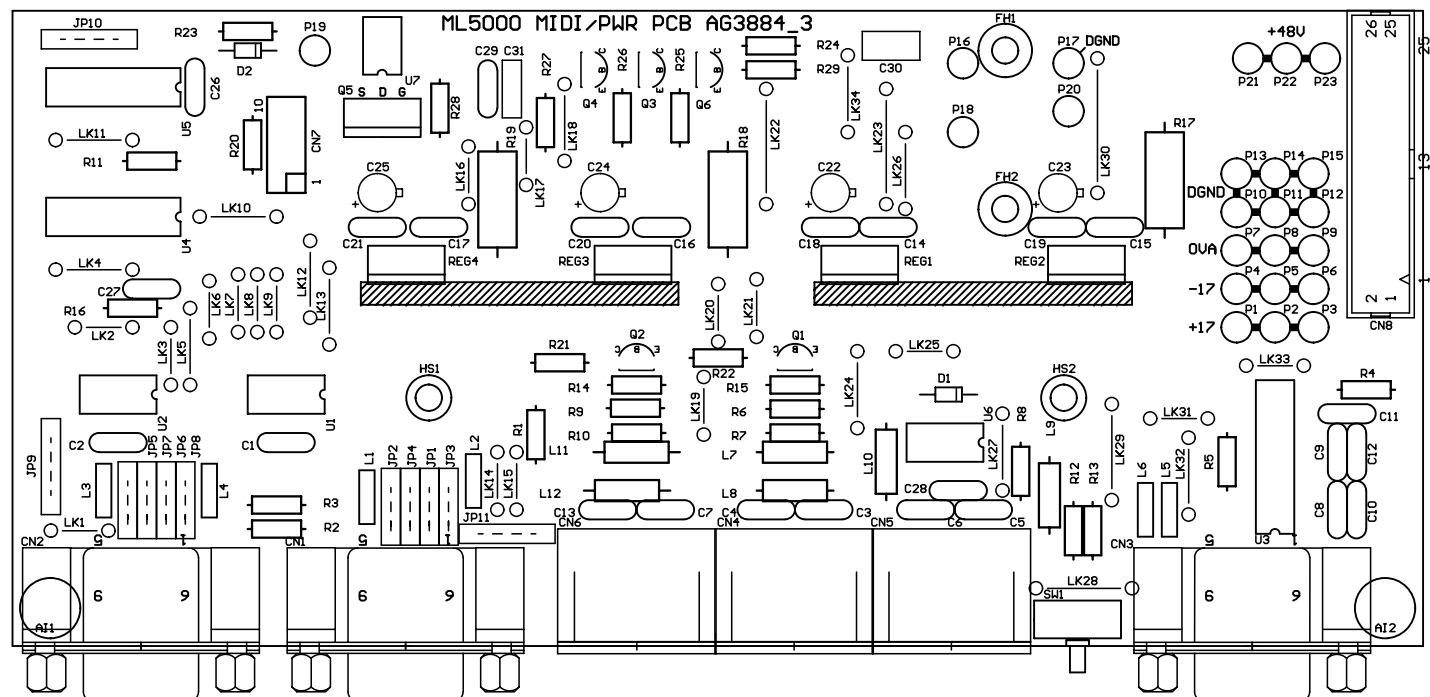
UNIT TITLE  
ML METERS

DRAWING TITLE  
ML METER LED BARS  
CIRCUIT DIAGRAM PCB AG4356

ALLEN & HEATH **D72**  
PENRYN, CORNWALL  
ENGLAND, TR10 9LU

DRAWING No C4356 SHT 1 of 1 ISSUE 1 A1

e  
d  
c  
b  
a



.GTO

D73

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FILE: AG3884\_3.PCB

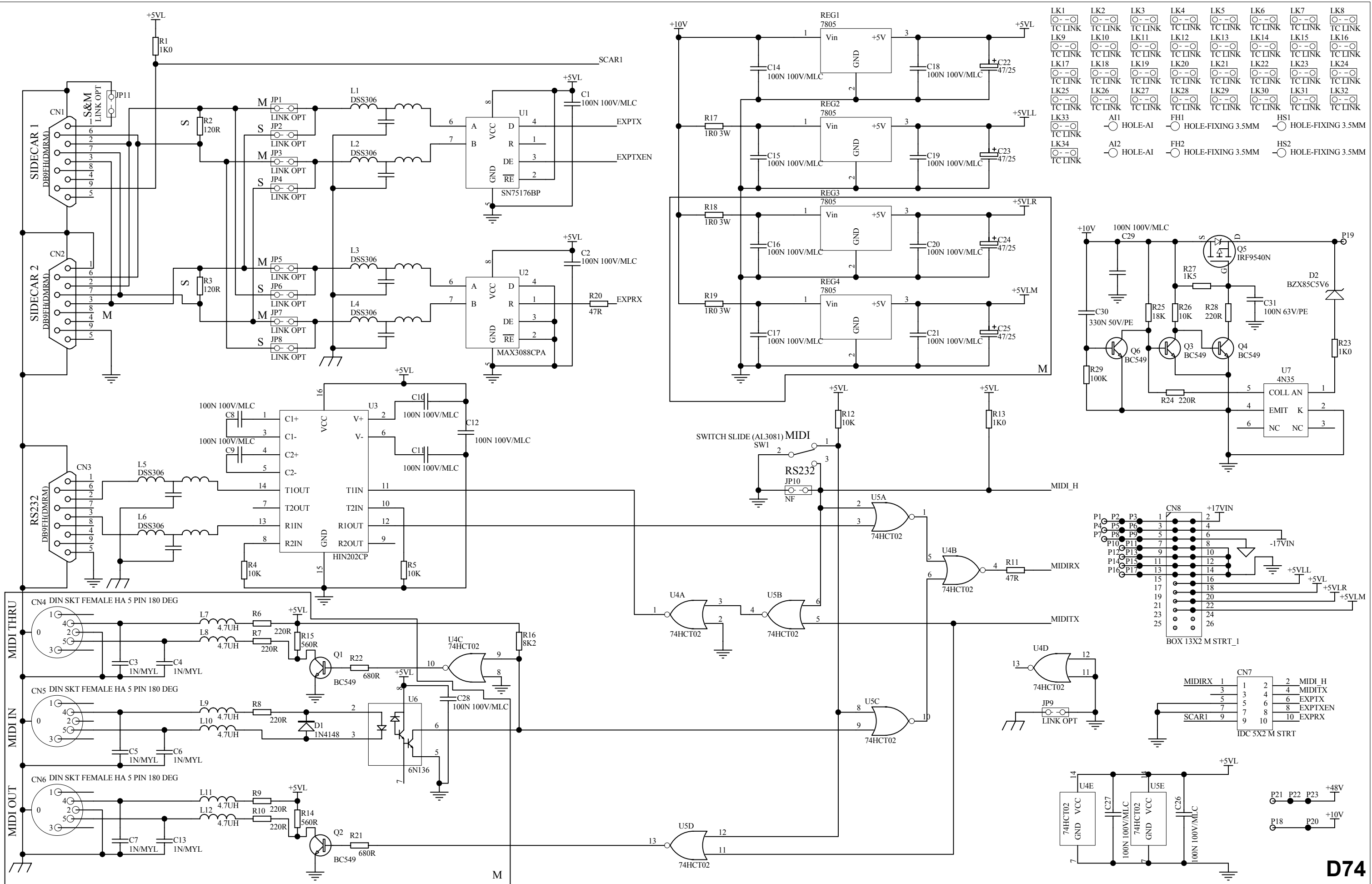
PRINTED: 17:09:36 6-Dec-2002

TITLE: ML5000 MIDI POWER PCB

DRG No: AG3884 ISSUE: 3

ALLEN&HEATH ML5000 SERVICE MANUAL

A B C D E F G H



D74

ISSUE	BY	DATE
2	AAT	24-05-01
2.1	AAT	30-10-01
3	JB	21-05-02

ISSUE 2 CONVERSION TO PROTEL AND ADDITION OF 10V PROTECTION  
 ISSUE 2.1 U2 CORRECTED TO MAX3088CPA  
 ISSUE 3 CHANGES TO LITTLE LITE TRIP CIRCUIT

FILE: C3884\_3.Sch

TITLE: ML5000 MIDI POWER PCB

PAGE:

DRG No: C3884

ISSUE: 3

SHEET: 1 OF 1

A3

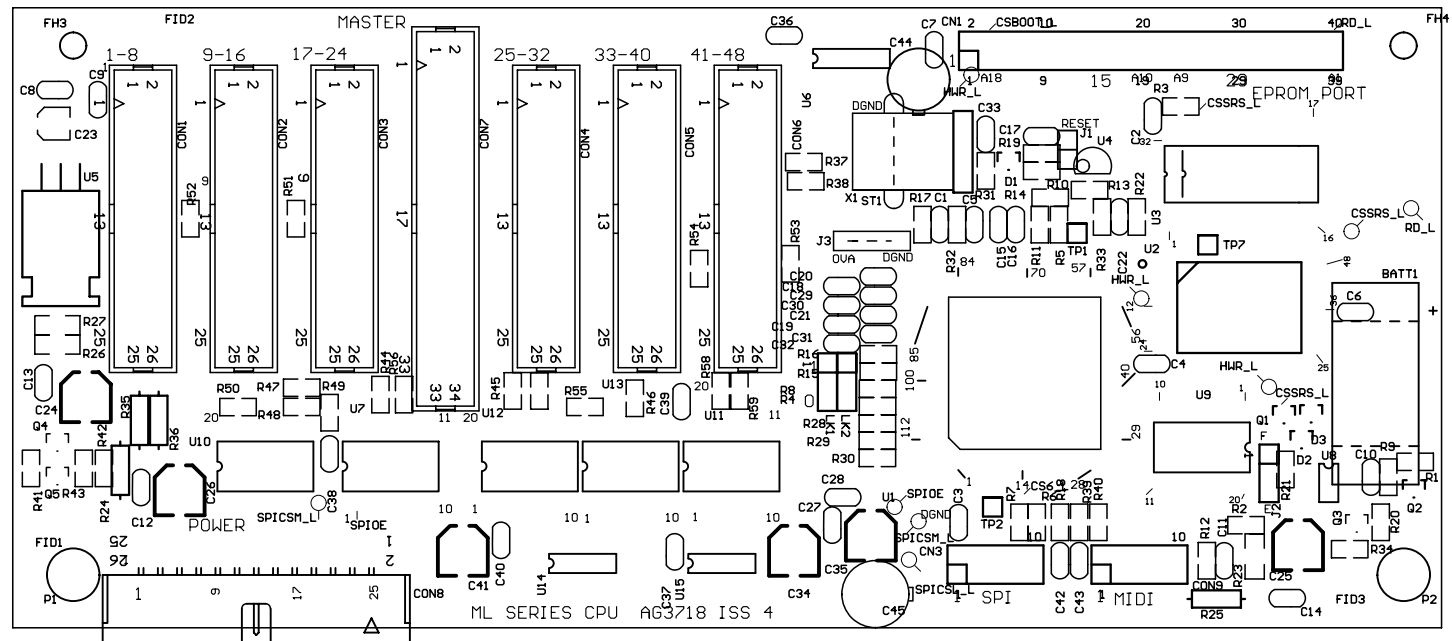
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PRINTED:17:11:07 6-Dec-2002

e  
d  
c  
b  
a

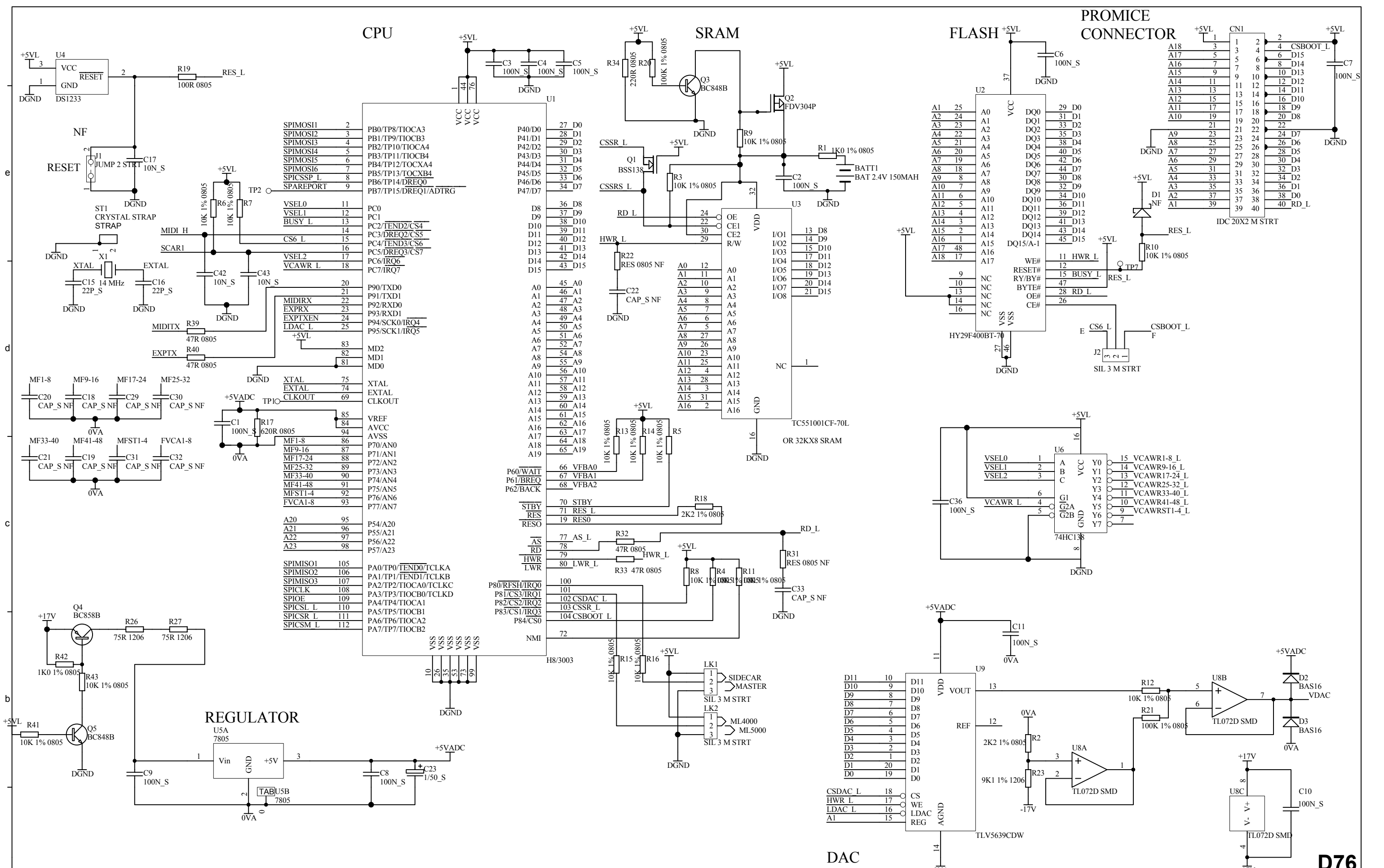


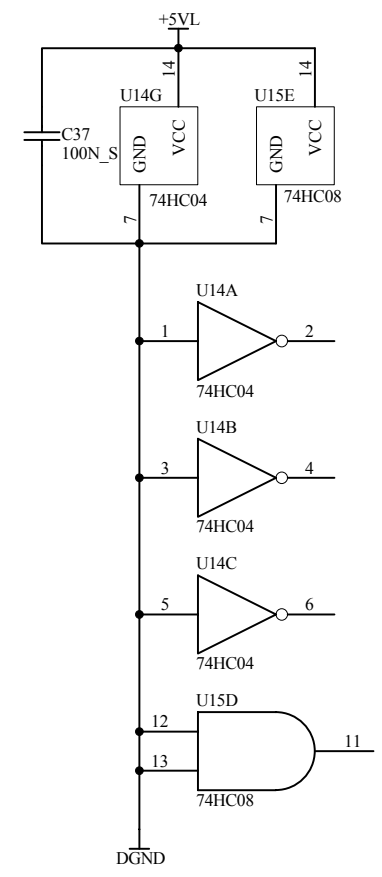
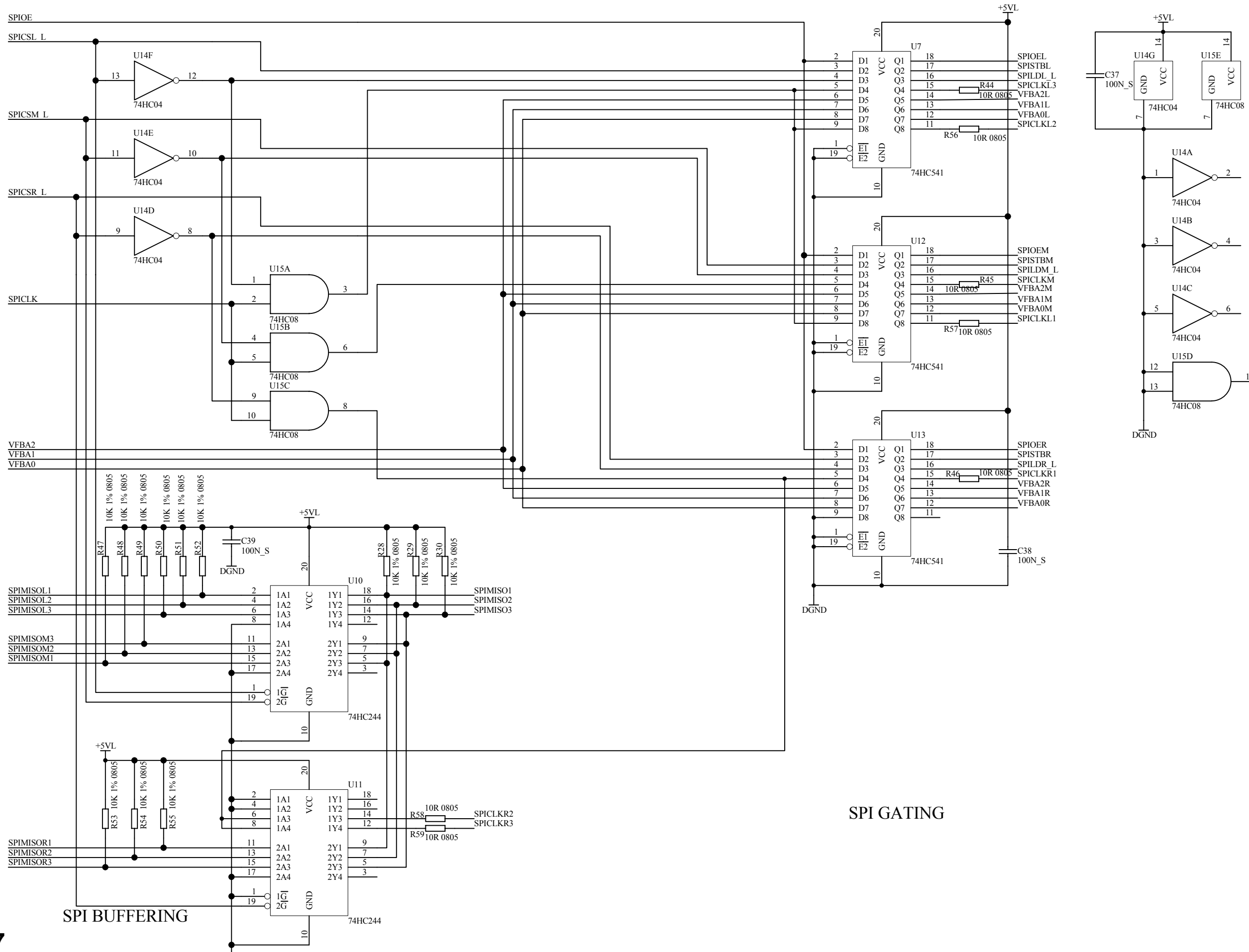
**D75**

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TOP OVERLAY	.GTO
FILE: AG3718_4.PCB	PRINTED: 11:54:19 3-Dec-2002

TITLE: ML SERIES CPU PCB
DRG No: AG3718 ISSUE: 4





SPI GATING

SPI BUFFERING

D77

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ISSUE	BY	DATE
ISS 3	AAT	07-12-00
ISS 3.1	AAT	26-01-01
ISS 3.2	AAT	26-10-01
ISS 4	AAT	20-11-01

FILE: AG3718\_4P3.SCH

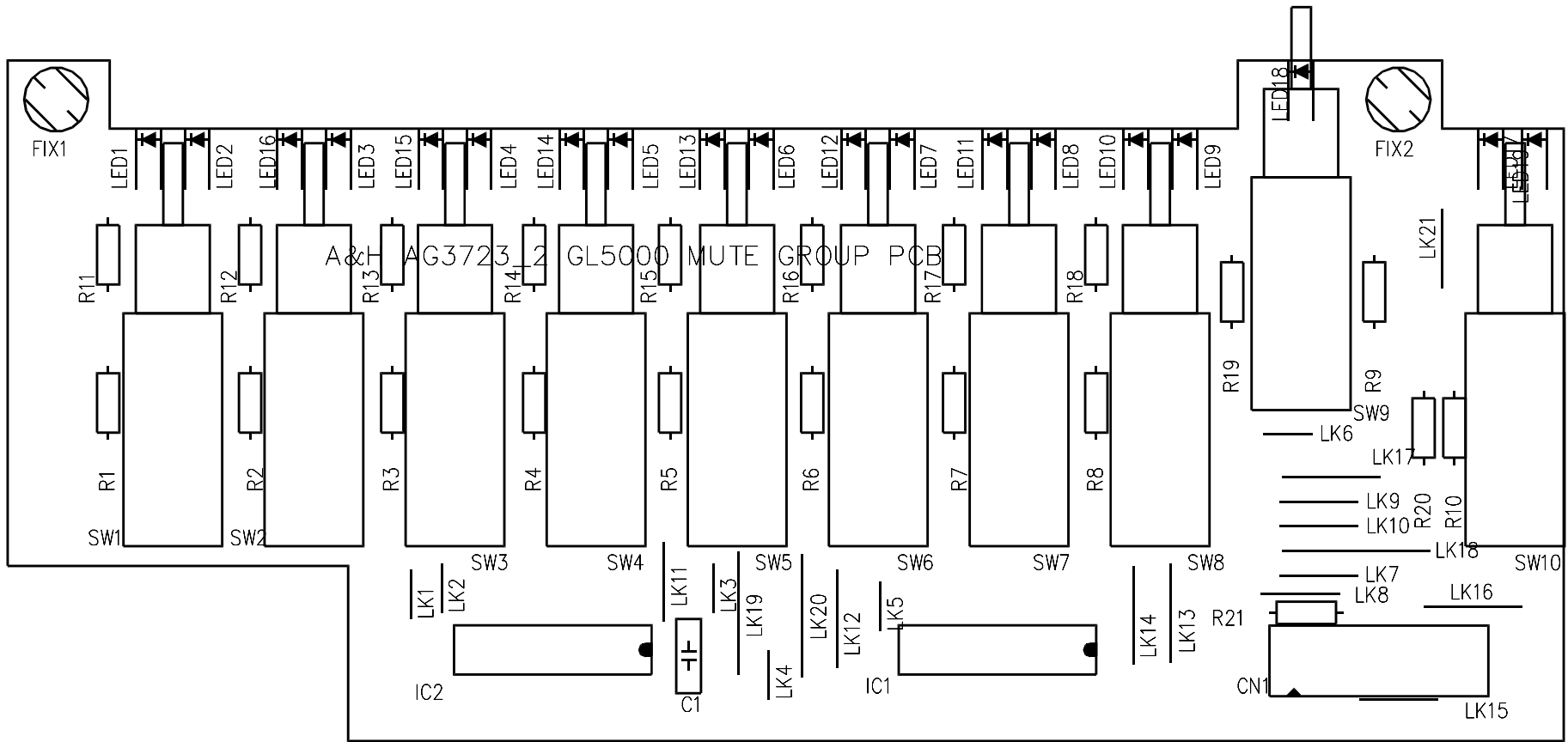
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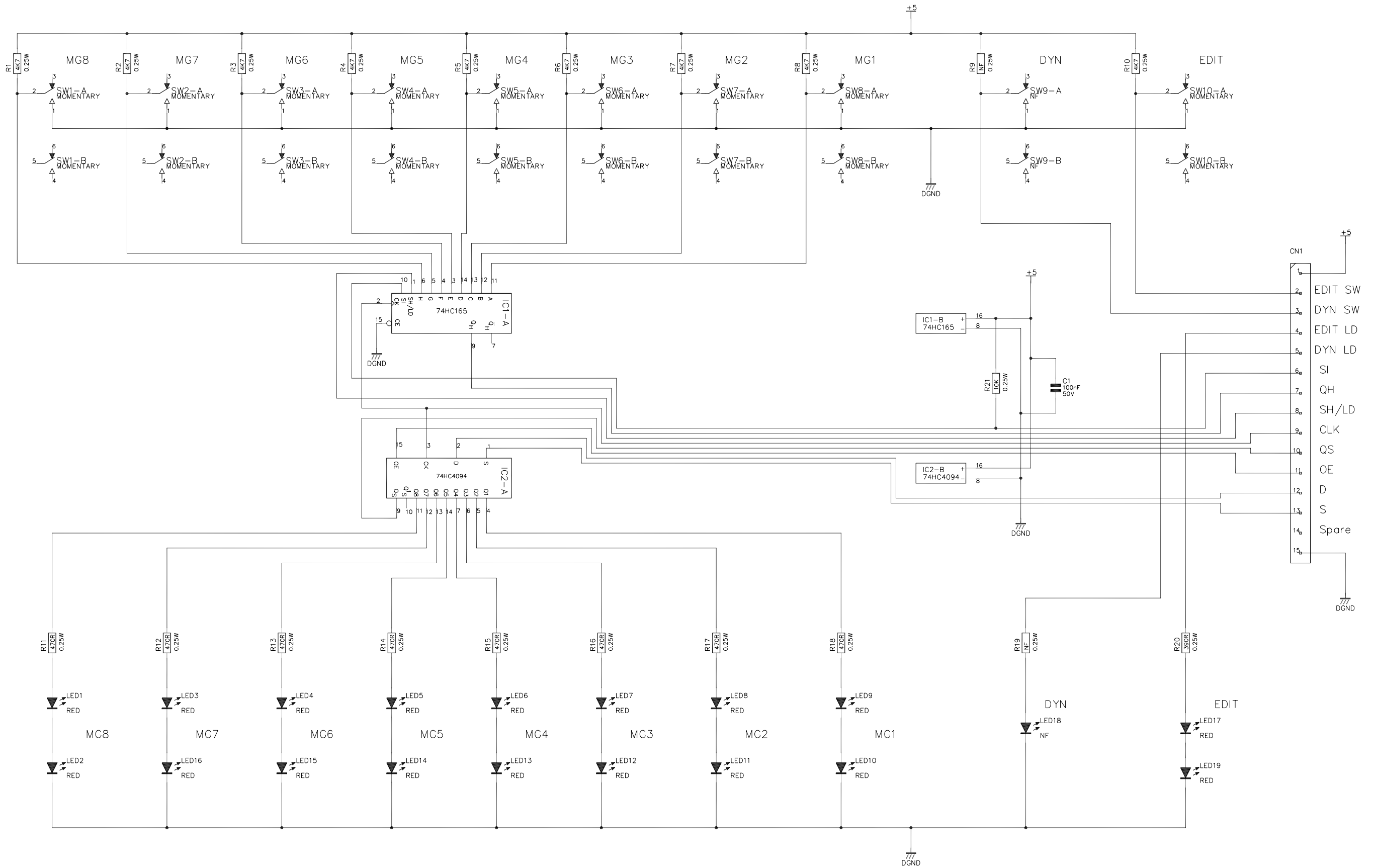
TITLE: ML3/4/5000 CPU PCB  
PAGE: SPI & BUFFERING

DRG No: AG3718 ISSUE: 4 SHEET: 3 OF 4









**D80**

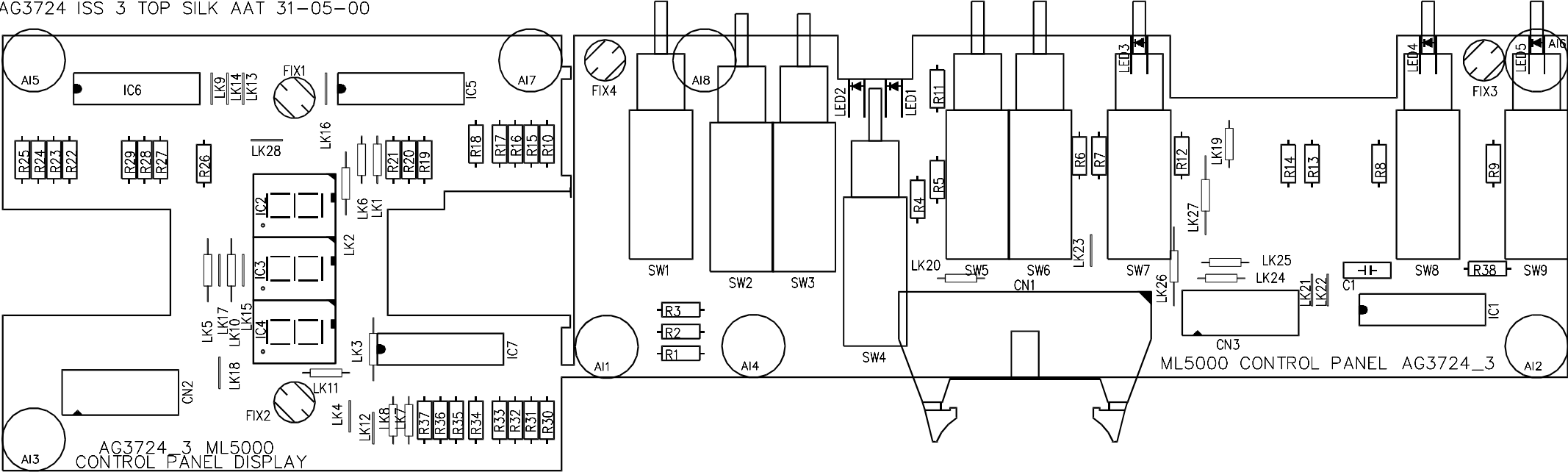
ISS	REVISION	BY	DATE
A	ORIGIN	GMR	30/7/99
1	GROUND PLANE ADDED TO MOUNTINGS	AAT	02-12-99
2	VALUE CHANGES &(LED HEIGHT)	AAT	22-02-00

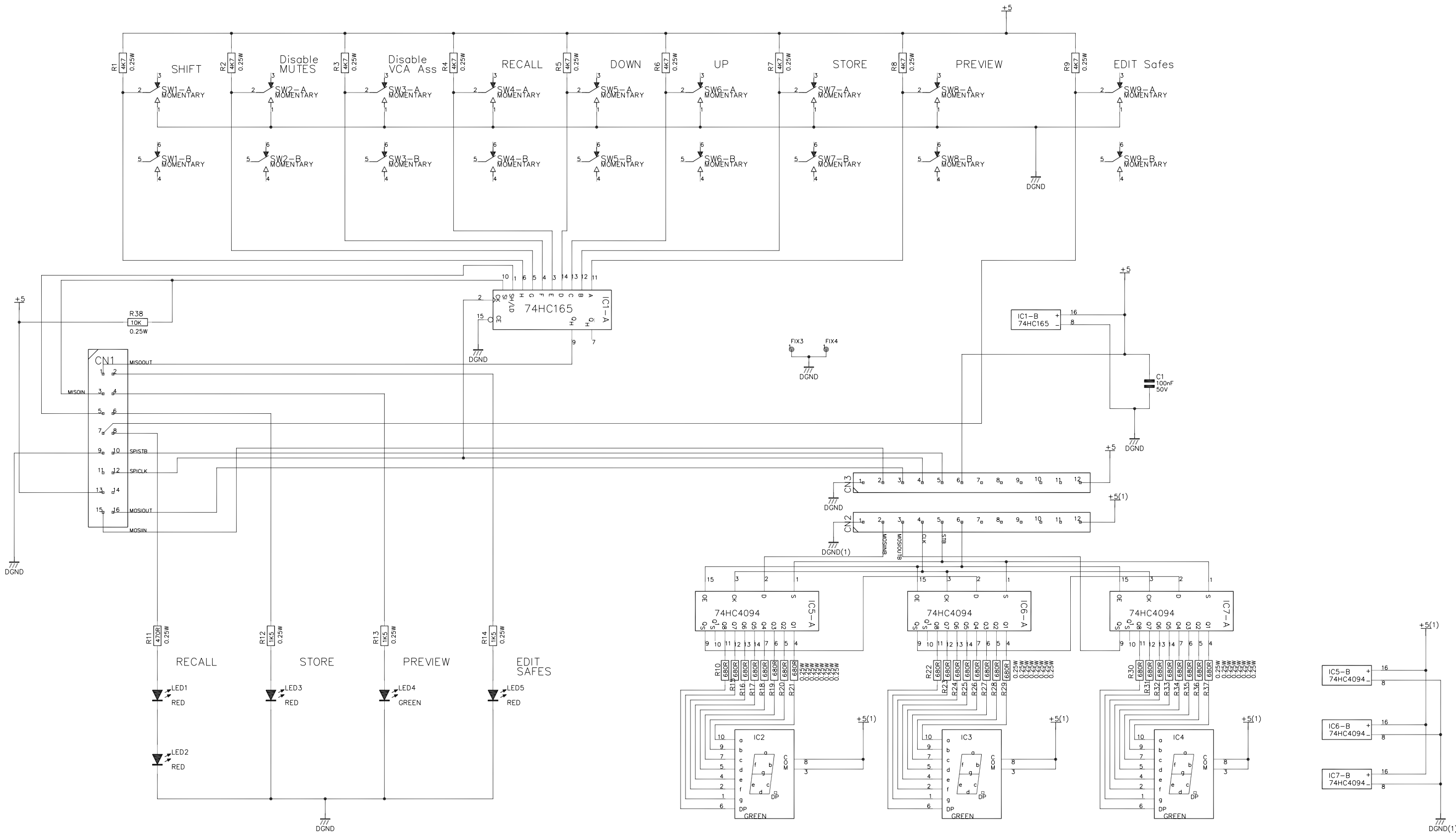
NOTES  
 1. RESISTORS MARKED \* ARE 1%  
 2. ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED  
 3. ELECTROLYTIC CAPACITORS ARE uF/VOLTS

UNIT TITLE ML5000  
 DRAWING TITLE Mute Group Keyboard  
 CIRCUIT DIAGRAM PCB AG 3723

ALLEN & HEATH  
 PENRYN, CORNWALL  
 ENGLAND, TR10 9LU  
 DRAWING No 3723 SHT 1 of 1 ISSUE 2 A1

AG3724 ISS 3 TOP SILK AAT 31-05-00





D82

ISS	REVISION	BY	DATE
A	ORIGIN	GMR	30/7/99
1	GROUND PLANE ADDED TO MOUNTINGS	AAT	02/12/99
2	VALUE CHANGE (LED HEIGHTS ON PCB)	AAT	22/02/00
3	MODE SWITCH HEIGHT LIFTED 2mm	AAT	31/05/00

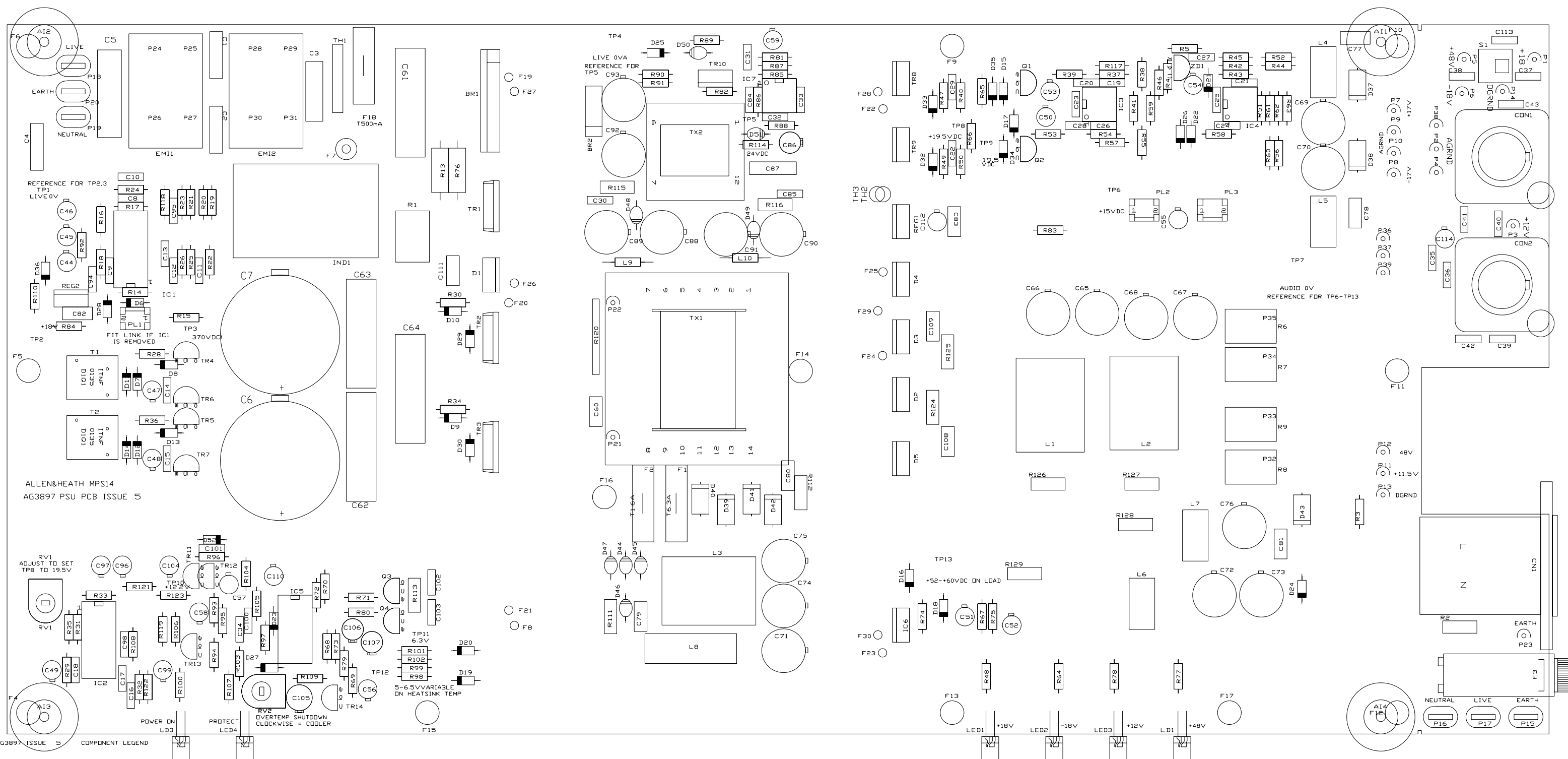
NOTES

1. RESISTORS MARKED \* ARE 1%
2. ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED
3. ELECTROLYTIC CAPACITORS ARE uF/VOLTS

UNIT TITLE ML5000  
 DRAWING TITLE Control Panel  
 CIRCUIT DIAGRAM PCB AG 3724

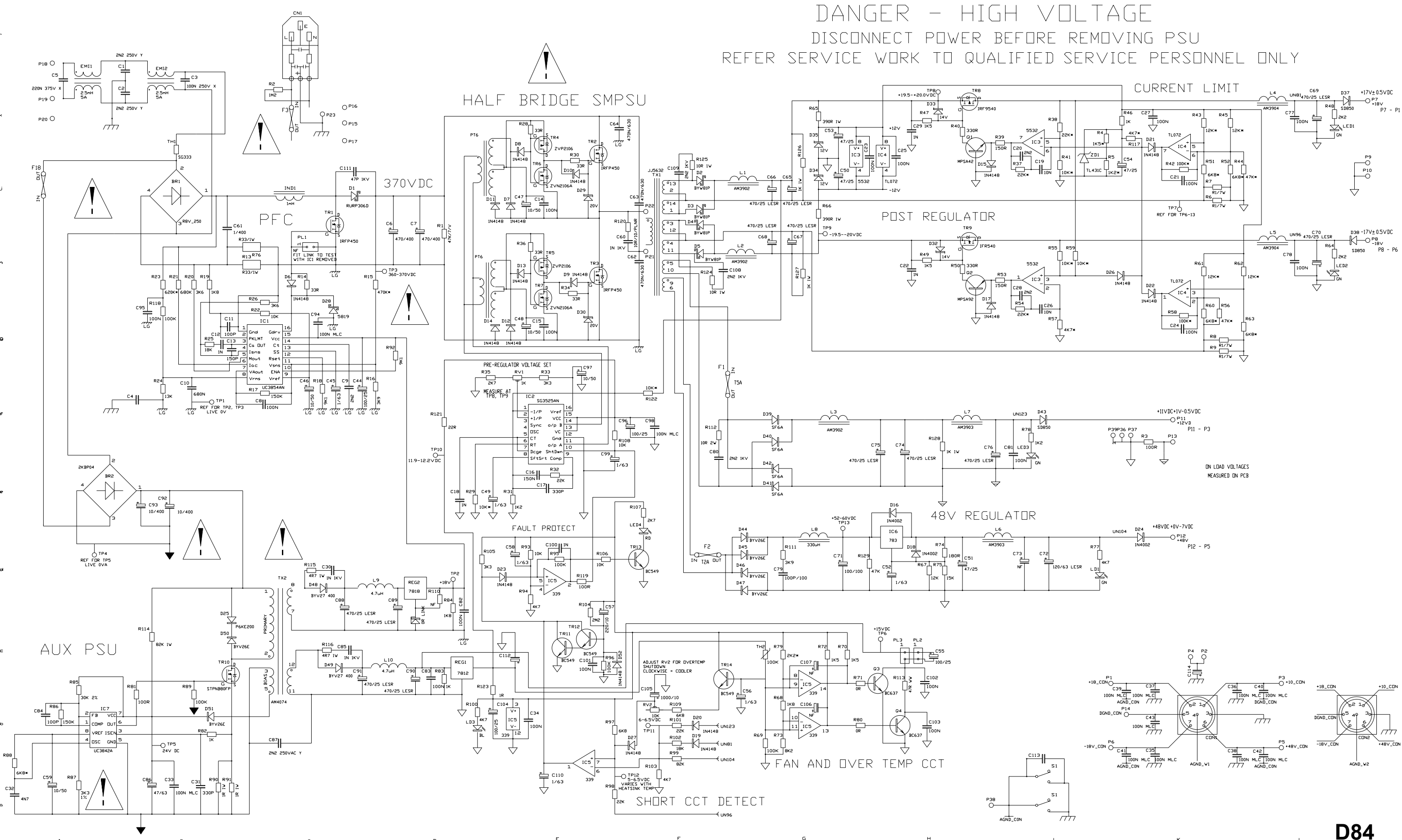
ALLEN & HEATH  
 PENRYN, CORNWALL  
 ENGLAND, TR10 9LU

DRAWING No 3724 SHT 1 of 1 ISSUE 3 A1



D83

**DANGER - HIGH VOLTAGE**  
 DISCONNECT POWER BEFORE REMOVING PSU  
 REFER SERVICE WORK TO QUALIFIED SERVICE PERSONNEL ONLY



ISS.	REVISION	BY	DATE	NOTES
1	PRODUCTION	ARJ	25-2-00	
2	VALUES	ARJ	25-4-00	
3	VALUE CHANGES PFC	ARJ	25-5-00	
4	PCB UPDATES	ARJ	25-10-00	
5	REVISION 3	ARJ	25-12-00	
6	REVISION 4	ARJ	26-08-00	
7	REVISION 5	ARJ	26-08-00	
8	REVISION 6	ARJ	26-08-00	
9	REVISION 7	ARJ	26-08-00	
10	REVISION 8	ARJ	26-08-00	

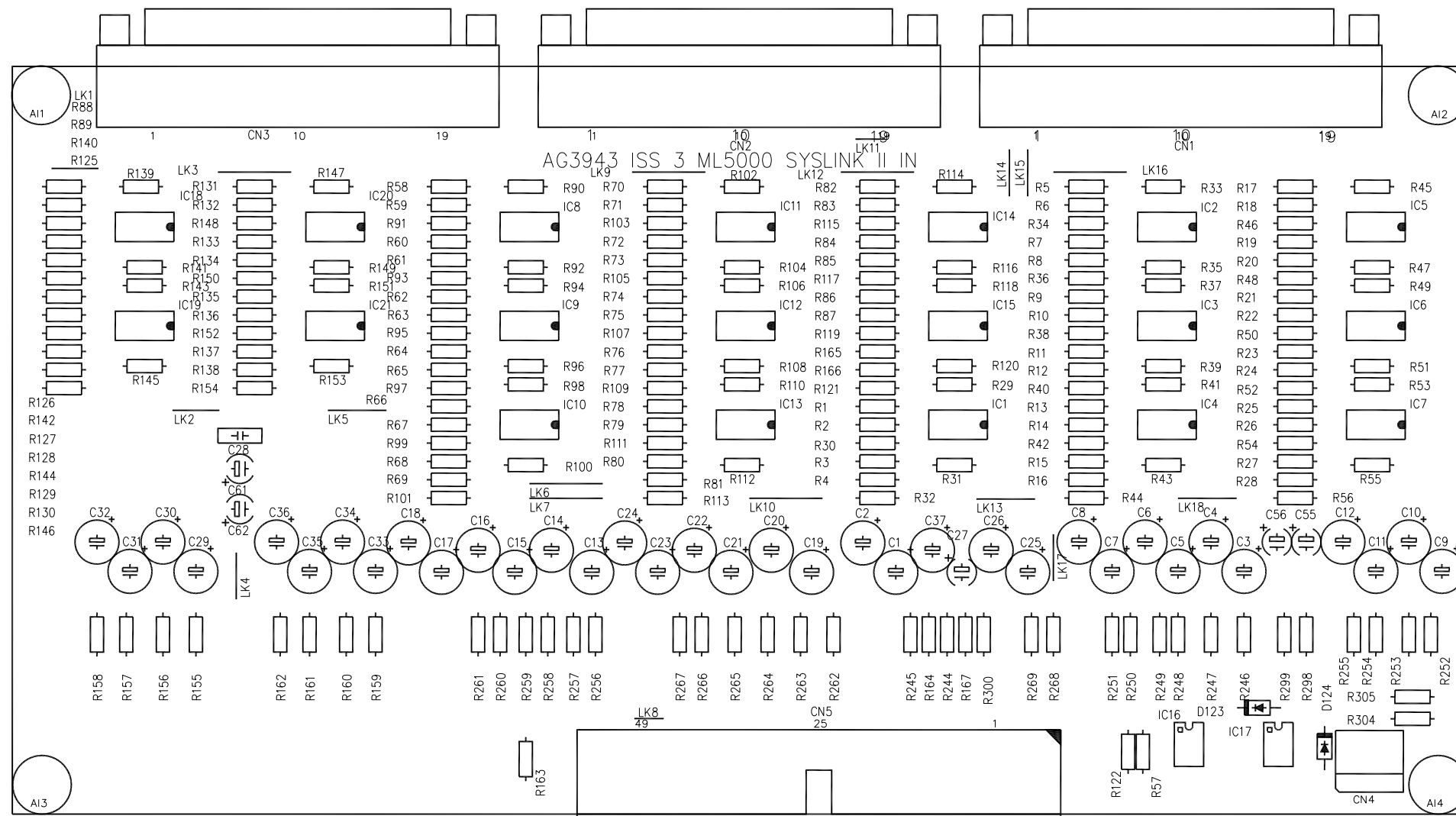
NOTES  
 1. RESISTORS MARKED \* ARE 1%  
 ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE MARKED  
 2. ELECTROLYTIC CAPACITORS ARE 7% VOLTAGE

**SERVICE PRECAUTION**  
 WHEN SERVICING THE UNIT ALWAYS CONNECT AN ISOLATING TRANSFORMER  
 OF SUITABLE POWER RATING BETWEEN THE POWER SUPPLY UNIT AND THE AC  
 LINE SUPPLY TO REDUCE THE RISK OF ELECTRIC SHOCK

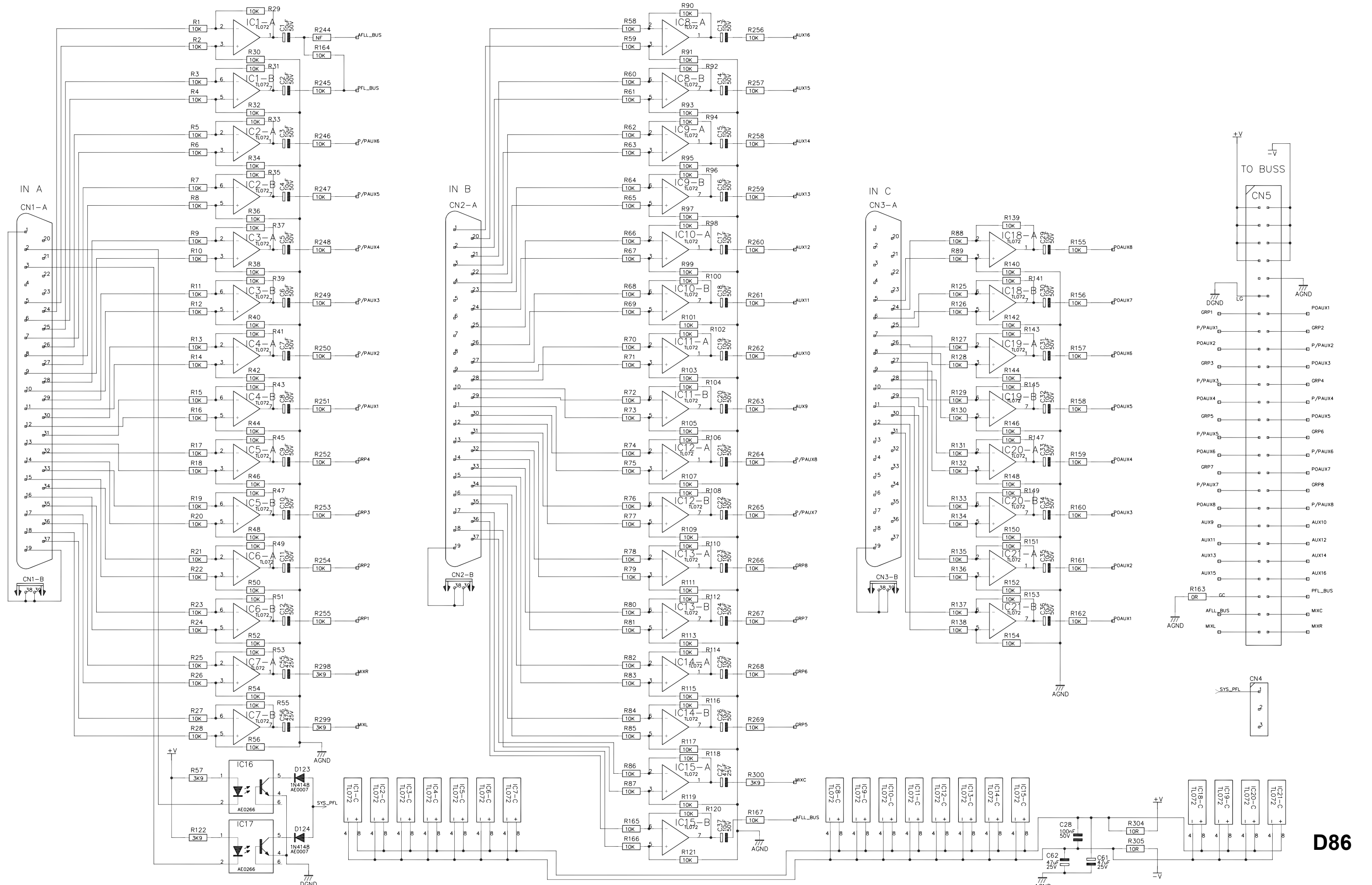
UNIT TITLE: MPS14  
 DRAWING TITLE: PSU SCHEMATIC  
 PCB AG3897

MANUFACTURED IN ENGLAND BY:  
 ALLEN & HEATH  
 DRAWING No. C3897 ISSUE 5.3 A1

**D84**



AG3943 ISS 3 TOP SILK BY AAT 06-09-01



**D86**

ISS	REVISION	BY	DATE
1	ORIGIN	GMR	8/11/99
2	AAT	GMR	8/03/00
3	AAT PFL CHANGES GROUND PLANE CLEARANCE	AAT	09/08/00
		AAT	07-09-01

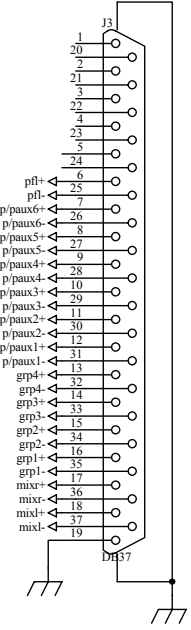
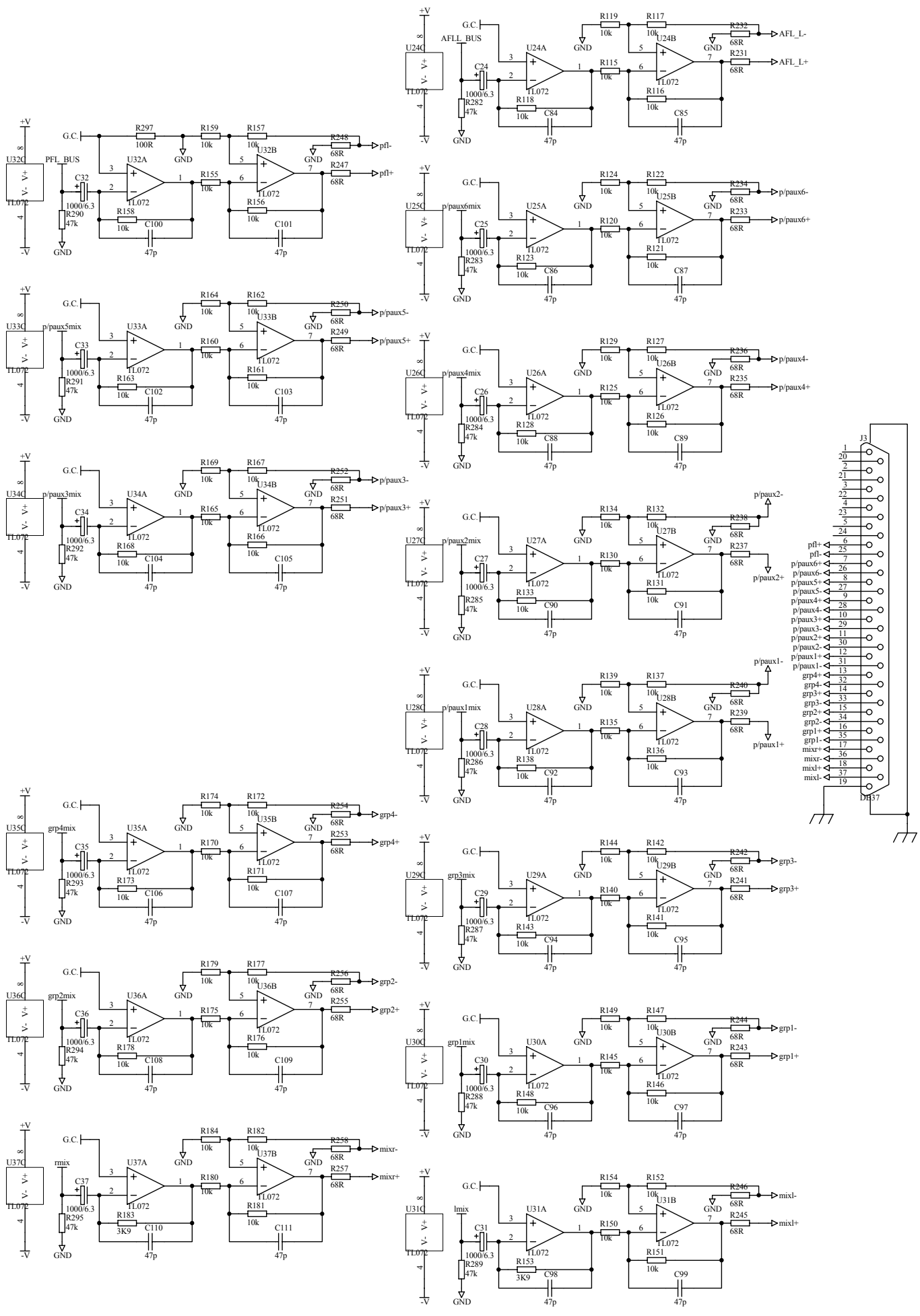
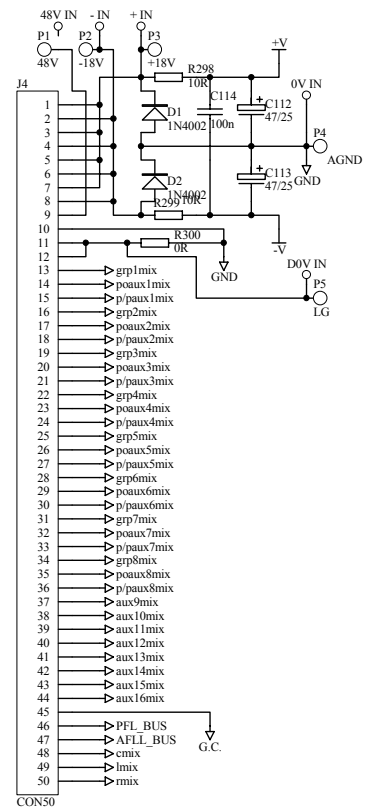
NOTES  
 1. RESISTORS MARKED \* ARE 1%  
 ALL OTHERS ARE 5% 1/4W UNLESS OTHERWISE STATED  
 2. ELECTROLYTIC CAPACITORS ARE uF/VOLTS  
 3.

UNIT TITLE  
**ML5000**  
 DRAWING TITLE  
**CIRCUIT DIAGRAM  
 SYSLINK 2 IN PCB**  
 PCB AC 3943

ALLEN & HEATH  
 PENRYN, CORNWALL  
 ENGLAND, TR10 9LU  
 DRAWING No C 3943 SHT 1 of 1 ISSUE 3 A1





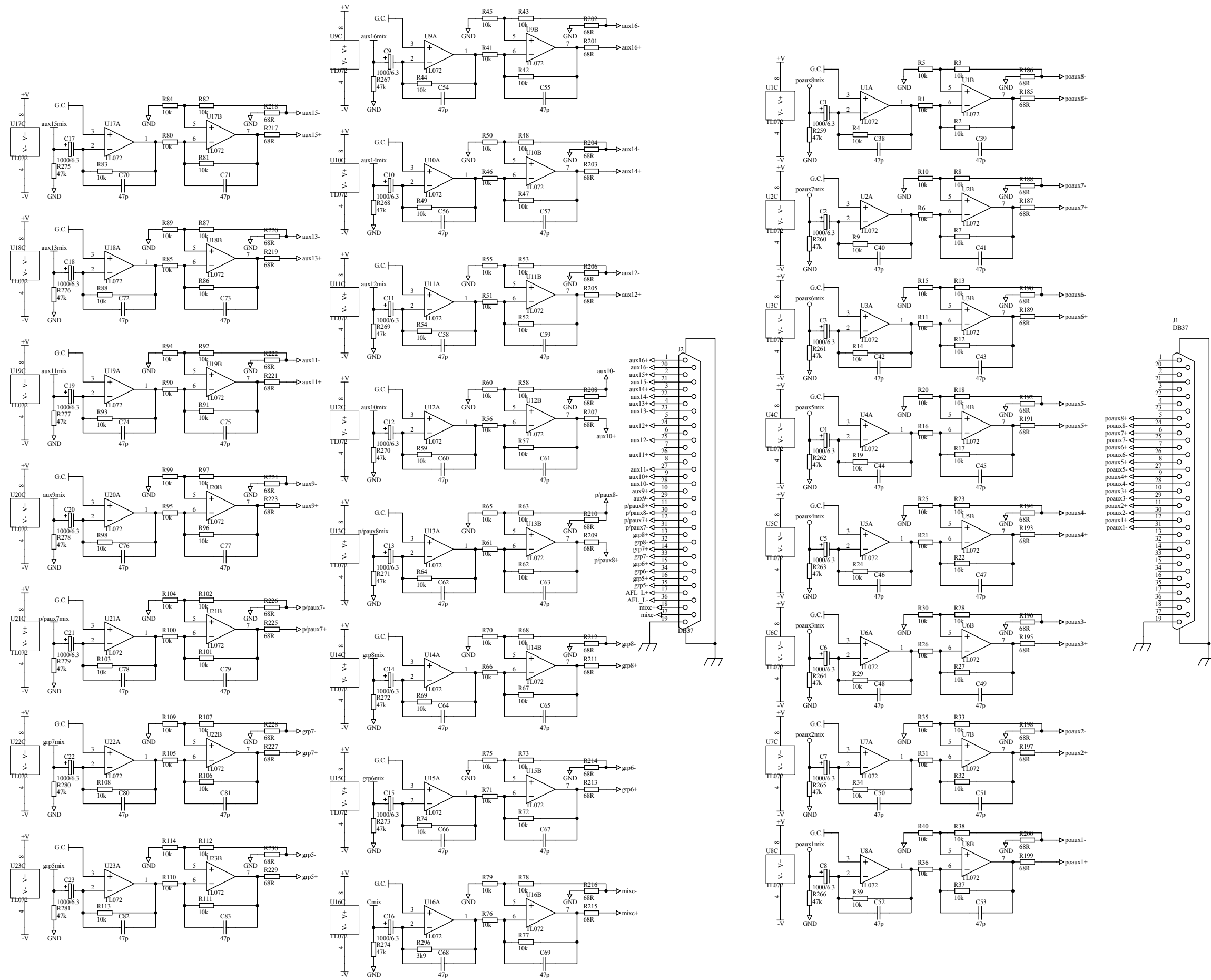


D88

ISSUE	BY	DATE
A	GMR	
1	AAT	06-06-00
2.1	AAT	05-09-00

FILE: G:\Product Directories\ML5000\PCB\ML5000SYSLINK II OUT\4013_2.1\SYSLINKOUT.ddb - Documents\AG4013	ISSUE: 2.1	DATE: 05-09-00	DISK:	NO.: C4013	ISSUE: 2.1	SHEET 1 OF 2	A3
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TITLE: ML5000 SYSLINK II OUT	Allen & Heath Kernick Industrial Estate, Penryn, Cornwall, England, TR10 9LU Tel: (44) (0) 1326 372070 Fax: (44) (0) 1326 365736
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D89

ISSUE	BY	DATE	TITLE	NO.	ISSUE	SHEET	OF	A3
1	GMR	06-06-00	ML5000 SYSLINK II OUT	C4013	2.1	2	OF	1
2.1	AAT	05-09-00						

FILE: G:\Product Directories\ML5000\PCB\ML5000SYSLINK II OUT\4013\_2.1SYSLINKOUT.dbt - Documents\AG4013\_2.1SYSLINKOUT.dbt

DISK: NO: C4013 ISSUE: 2.1 SHEET 2 OF 1 A3

Allen & Heath  
Kernick Industrial Estate,  
Penryn, Cornwall,  
England.  
TR10 9LU  
Tel: (44) (0) 1326 372070  
Fax: (44) (0) 1326 365736

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