ALLEN & HEATH

GS3 STUDIO CONSOLE V VCA

GS3
V5 UPGRADE

INSTALLATION PROCEDURE

PUBLICATION AP0189

LIMITED ONE YEAR WARRANTY

This product has been manufactured in the UK by ALLEN & HEATH LTD and is warranted to be free from defects in materials or workmanship for a period of one year from the date of purchase by the original owner.

To ensure the high level of performance and reliability for which this equipment has been designed and manufactured please read the User Guide before use.

In the event of a failure notify and return the defective unit to ALLEN & HEATH Ltd. or its authorised agent as soon as possible for repair under warranty subject to the following conditions:

CONDITIONS OF WARRANTY:

1. The upgrade has been installed and operated in accordance with the instructions in the Installation Instructions and User Guide.
2. The assemblies have not been subject to misuse either intended or accidental, neglect, or alteration other than as described in the Installation Instructions, User Guide or Service Manual, or approved by ALLEN & HEATH Ltd.
3. Any necessary adjustment, alteration, or repair has been made by ALLEN & HEATH Ltd. or it's authorised agent.
4. The defective unit is to be returned carriage prepaid to ALLEN & HEATH Ltd. or it's authorised agent with proof of purchase.
5. Units to be returned should be packed to avoid transit damage.

These terms of warranty apply to UK sales. In other territories the terms may vary according to legal requirements.

ALLEN & HEATH AGENT:

U.K. FACTORY:

ALLEN & HEATH Ltd.
Kernick Industrial Estate,
Penryn.
Cornwall. TR10 9LU.

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WARNING

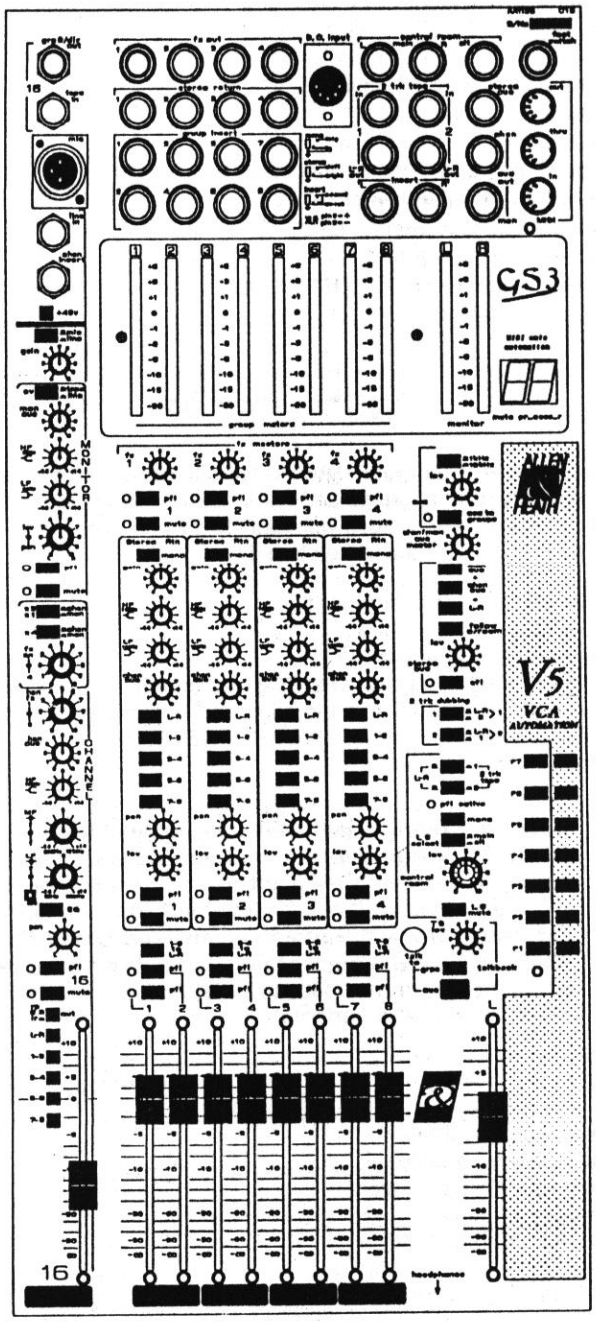
Much of the work required in carrying out the upgrade will involve detailed soldering of assemblies. Therefore; it is recommended that only technically competent personnel should carry out this work. If for any reason you **do not** feel confident about undertaking the work, then contact your supplier's technical support line; they will be able to offer you further assistance.

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Publication AP0189 Issue 1

GS3-16 CONSOLE WITH V5 UPGRADE INSTALLED



INTRODUCTION

The GS3 V5 Upgrade kit allows you to add V5 VCA fader automation software to your GS3 console. V5 Automation software will give you the following advanced features:

- O VCA fader & mute automation
- O Mute & fader groups
- O Solo-in-place
- O 33 VCA and/or mute Patch memories
- O Mute or VCA Channel isolation
- O Comprehensive mix editing facilities
- O Enhanced Function Keys
- O Synchronisation to SMPTE, MTC & MIDI Clocks
- O MTC Regenerator (for SMPTE Sync)

INSTALLATION

Please carefully read and understand these instructions before commencing any work. For reasons of clarity, the diagrams and text in this manual refer to the upgrade of a GS3-16 console. These instructions will apply to 24 and expanded 32 Channel GS3 consoles but differences in procedure should be noted.

The upgrade involves the following stages:

Stage 1:- dis-assembling the console.
Stage 2:- removing the Mute Processor PCB and faders.
Stage 3:- perform a gain modification to all Input Channels and Master PCBs.
Stage 4:- fitting new Micro, Keyboard, VCA & Fader PCBs.
Stage 5:- reassembling the console.

Precaution: **This work requires partial disassembly of the console. Take care to avoid damage to the internal assemblies, connector harnesses, cosmetics and external paint finish. The work should be carried on a table as you will need to overhang the console to gain access the underside. Make sure that your work area is free of dirt and debris which may damage the console. Avoid balancing the console on one of its corners; if possible, enlist the help of a colleague when moving the console.**

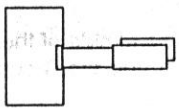
You will require the following hand tools to perform the upgrade:

- M6 hex key (supplied)
- M2.5 hex key (supplied)
- No.2 cross-point screwdriver.
- Soldering iron
- Solder braid or solder sucker.

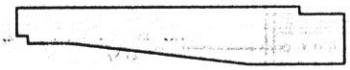
Before proceeding, check the contents of the kit supplied against the packing sheet. If any components are missing, please contact your supplier.

IDENTIFICATION OF PARTS

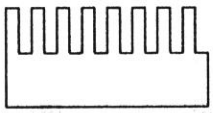
Use the following table to identify the parts refered to in the upgrade procedure.



V-Micro PCB
AG0330
ZX000-246



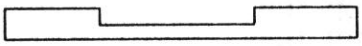
Keyboard PCB
AG0332
ZX000-240



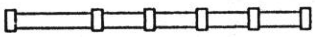
VCA Slave PCB
AG0314
ZX000-241



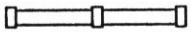
Channel VCA PCB
AG0315
ZX000-242



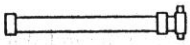
Upgrade Label
AN0384



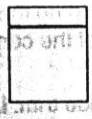
Mute Slave Harness
AL0551



VCA Slave Harness
AL0552



VCA Slave Expander Harness
AL0554
(not for GS3-16)



Upgrade Assembly Kit
ZX000-243



Bag1
M3x8mm
button screws
M4 Hex Key
M2.5 Hex Key



Bag2
M3x8mm screws
12KOhm Resistors



Bag3
Cable Ties
M3 Plastic
Spacers



Bag4
M3x15mm
pillar screws
22KOhm
Resistors

PROCEDURE

Stage 1:- DIS-ASSEMBLING THE CONSOLE.

1. Remove the fader knobs from all of the Channel faders and right Master fader and put to one side. **Do not** remove the knobs from the group faders and left Master fader.
2. Locate the mute automation control section on the right hand side of the console, *see Fig. 1a*. Unscrew the footswitch jack socket nut (A) and the 3 countersunk screws (B). Retain 2 of the screws for later.

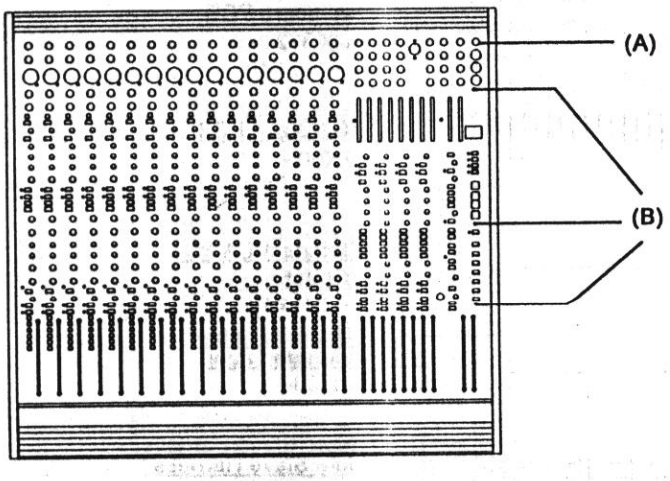


Fig. 1a.
Location of footswitch & screws.

3. Turn the console upside down. *see Fig. 1b*. Remove all of the base retaining screws (C). Lift the base clear of the console.
4. Unscrew the headphones socket, jack nut and washer (D) from the front extrusion (G) and move the jack socket clear of the extrusion.
5. Using the M6 hex key provided, remove the 6 hex screws holding the front extrusion to the side trims (E). Carefully lift the front extrusion clear of the console and place it to one side.
6. Remove the 3 hex screws (F) from the top of the left-hand side trim. Lift the side trim clear of the console and place it to one side.
7. Lift the rear extrusion (H) and right hand side trim just clear of the console.

Precaution: Do not strain the green earth wire connected to the rear extrusion.

8. Unscrew the green earth wire from the rear extrusion. Retain the screw for re-assembly. Lift the extrusion & side trim clear of the console.

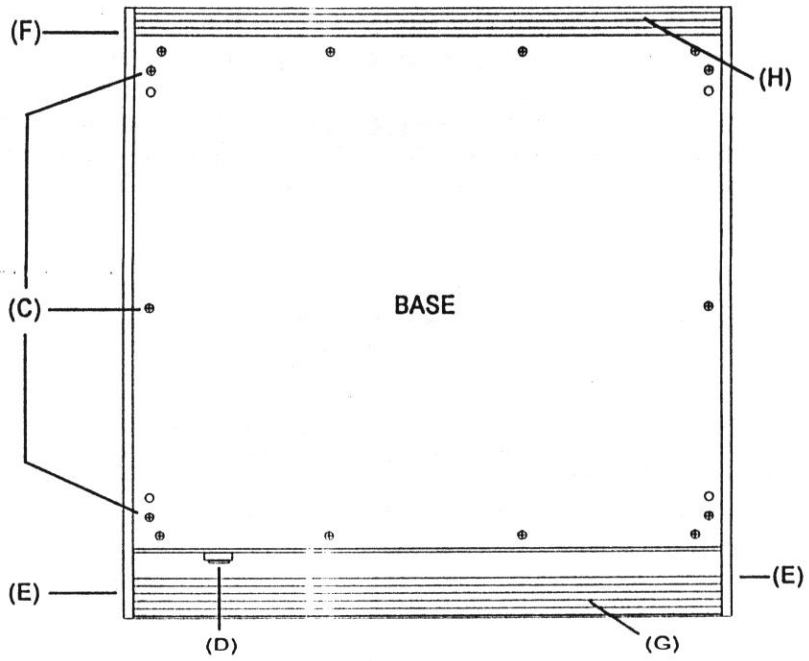


Fig. 1b.
Console inverted showing base,side trims & headphone socket.

PRECAUTION: **In it's present state, do not lift the console by it's side edges so that it bows in the middle. This could stress the PCBs and potentiometers.**

NOTE: **For consoles expanded after manufacture.**

The expanded sections will not be joined to the main console section. It is advisable to disconnect the main 40 way ribbon harness and 16 way ribbon harness from the expander sections to prevent possible damage by over tensioning the harnesses.

Stage 2:- REMOVING THE MICRO PCB AND FADERS

1. Refer to *Fig. 2.* Remove the main ribbon harness (A). Remove the Mute Slave harness (B) by first cutting the cable ties holding the harness connectors to the Mute Slave PCBs. **Do not** cut the cable ties holding the Mute Slave PCBs to the Channel PCBs.

PRECAUTION: **Take care not to bend or distort the connector pins when removing the harnesses.**

2. Locate the Red & Green wires from XLR power Input connector to the top of Mute Processor PCB (C). Carefully de-solder the Red & Green wires from the Mute Processor PCB. **Do not** desolder the wires from the XLR power connector. Lift the Mute Processor PCB clear of the console.

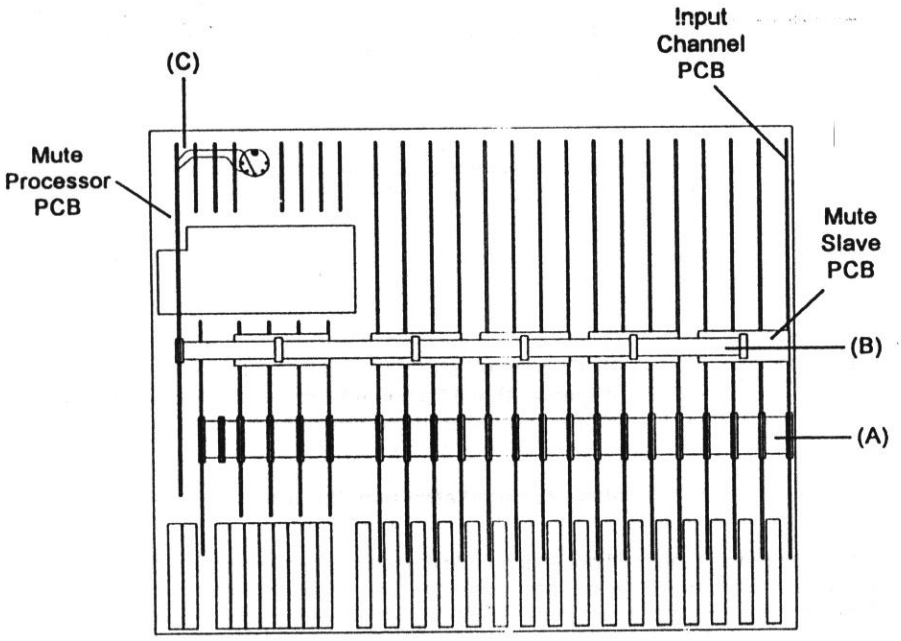


Fig. 2.
Console inverted with base & chassis removed.

3. De-solder the Red, Green & Blue fader wires from the Channel PCBs for every Input Channel (not Group faders). *see Fig. 3.* ***Do not*** de-solder the wires from the faders. Clean up the remaining solder from the PCB holes using suitable solder braid or solder sucker.

PRECAUTION: **Take care not to damage any PCB tracks or pads. Be careful not to burn or damage the Black group assignment wires soldered to the track side of each Channel PCB.**

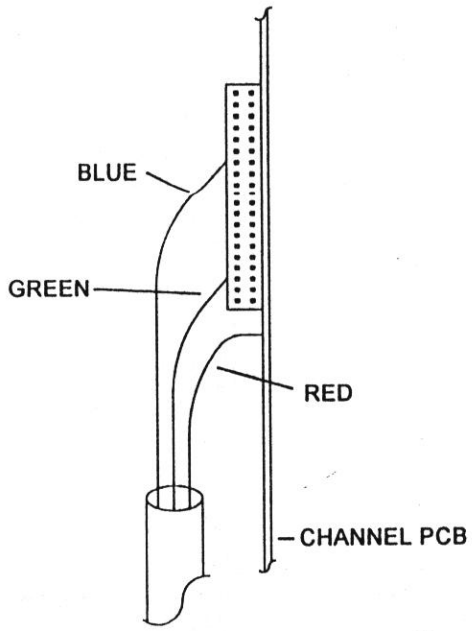


Fig. 3.
Fader wiring to Channel PCB.

4. Locate the right & left Master fader wires running from the master faders to the Master PCB (PCB No: AG0310), *see Fig. 4.* De-solder the screened red and blue wires from the faders and the PCB. Clean up the holes in the Master PCB using suitable solder braid or a solder sucker. Cut the cable tie that holds the wires to the front panel and remove the screened wires. Then unsolder the red and blue wires (A) that connect to the top of the right & left Master faders. **Do not** remove them as they will be required at a later stage.

5. Move the console so that the faders overhang the edge of your work surface, to gain access to the Channel fader mounting screws. Unscrew each Channel fader screw from beneath and remove all the Channel faders. Remove the right Master fader in a similar fashion. **Do not** remove the Group faders or the left Master fader. The screws, spacers and faders will no longer be required.

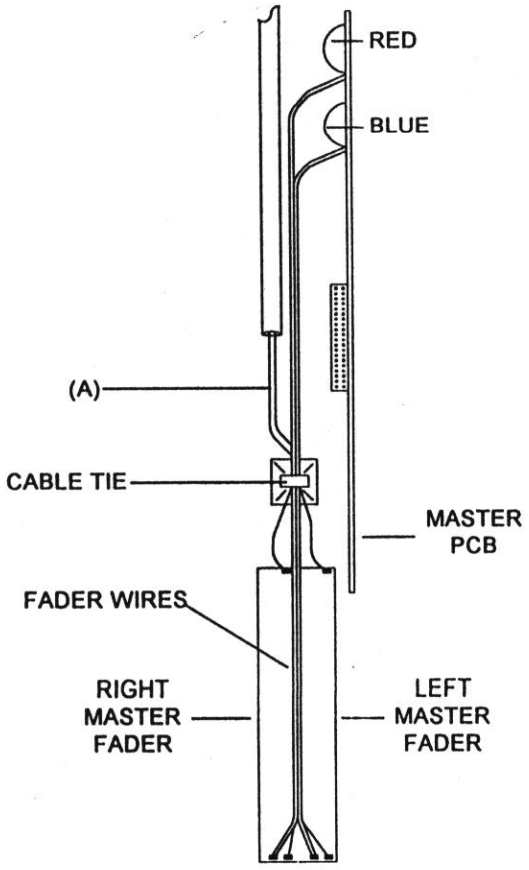


Fig. 4.
Fader wiring to Master PCB.

Stage 3:- PERFORM THE GAIN MODIFICATION

1. Locate the 47K resistor R97 on the Input Channel PCB, *see Fig. 5.* Solder a 22K resistor across R97, as shown, for every Input Channel PCB. Tin the resistor legs first and check your work to ensure good solder joints.

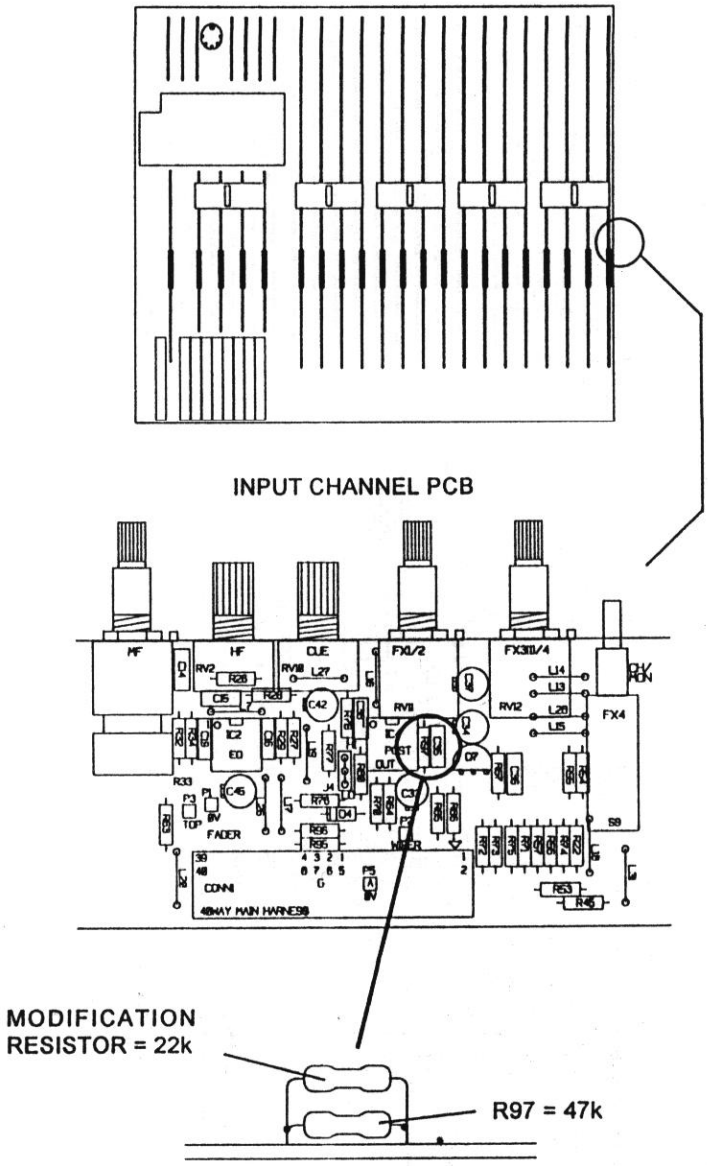


Fig. 5.
Modification to Input Channel PCB.

2. Locate the 27K resistors R10 and R13 on the Master PCB, *see Fig. 6.* Solder two 12K resistors across R10 and R13 on the Master PCB. Tin the resistor legs first and check your work to ensure good solder joints.

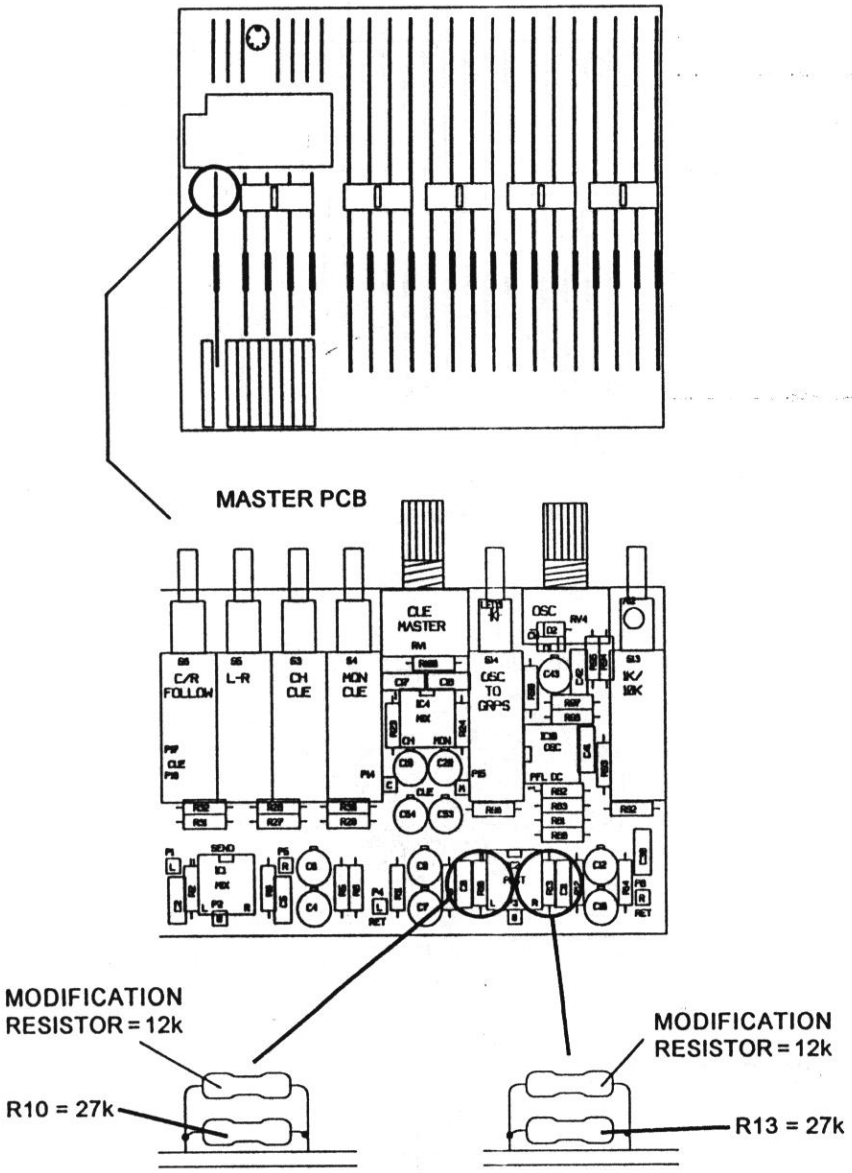


Fig. 6.
Modification to Master PCB.

Stage 4:- INSTALL NEW FADER PCBS

1. Fit the black plastic spacers supplied to the front panel using the "button" type fader mounting screws supplied. *see Fig. 7.* The plastic spacers will prevent the screws from falling out. Do this for every Input Channel fader.

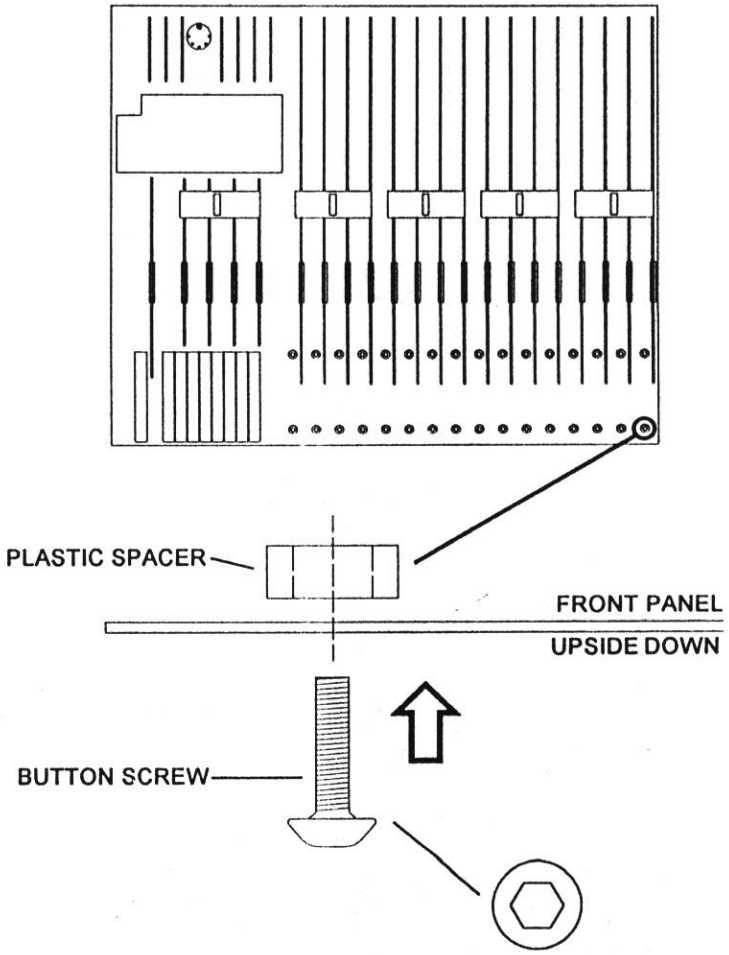


Fig. 7.
Fitting mounting screws & spacers for VCA slave PCBs.

2. Unpack the VCA Slave PCBs (PCB No: AG0314) from the kit. Mount the VCA Slave PCBs onto the front panel with the fader mounting holes aligned with the screws and spacers see *Fig. 8*. There is one VCA Slave PCB for every 8 Input Channels. Screw the PCBs into place using the 16 button head screws.

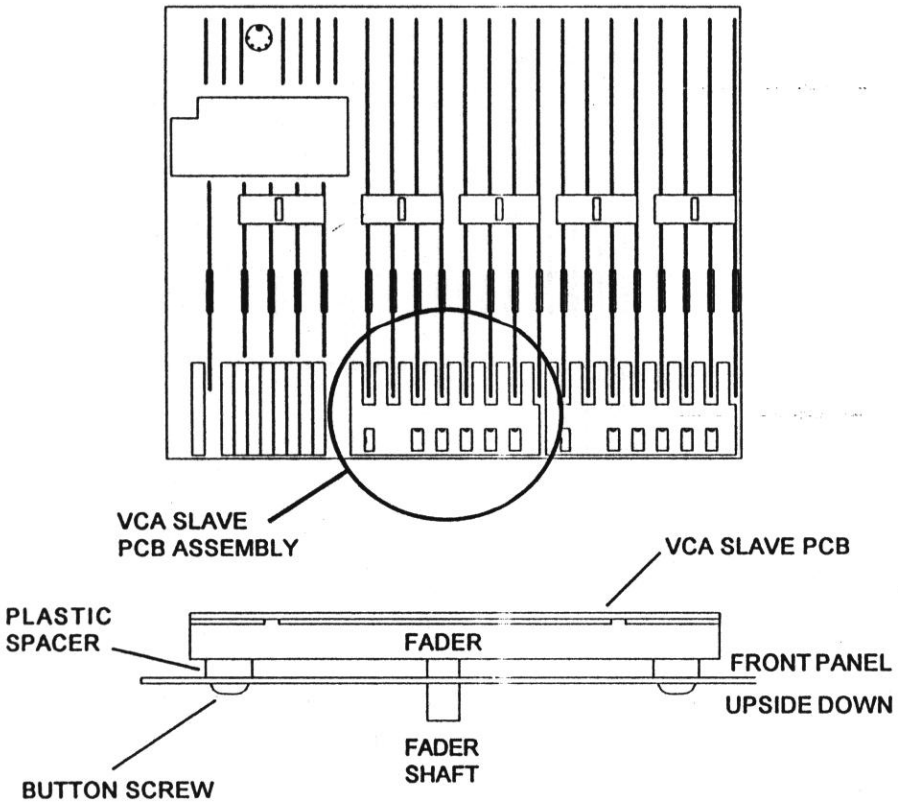


Fig. 8.
Fixing VCA slave PCBs to front panel.

3. Unpack the Channel VCA PCBs (PCB No: AG0315) from the kit. Rest them on the VCA Slave PCBs for now. Solder the Red, Green & Blue wires from the Channel VCA PCBs into the Input Channel PCBs as shown, *see Fig. 9.*
4. Screw the Channel VCA PCBs firmly onto the VCA Slave PCBs pillars using the M3 x 8mm screws provided. There are two mounting screws for each Channel VCA PCB.

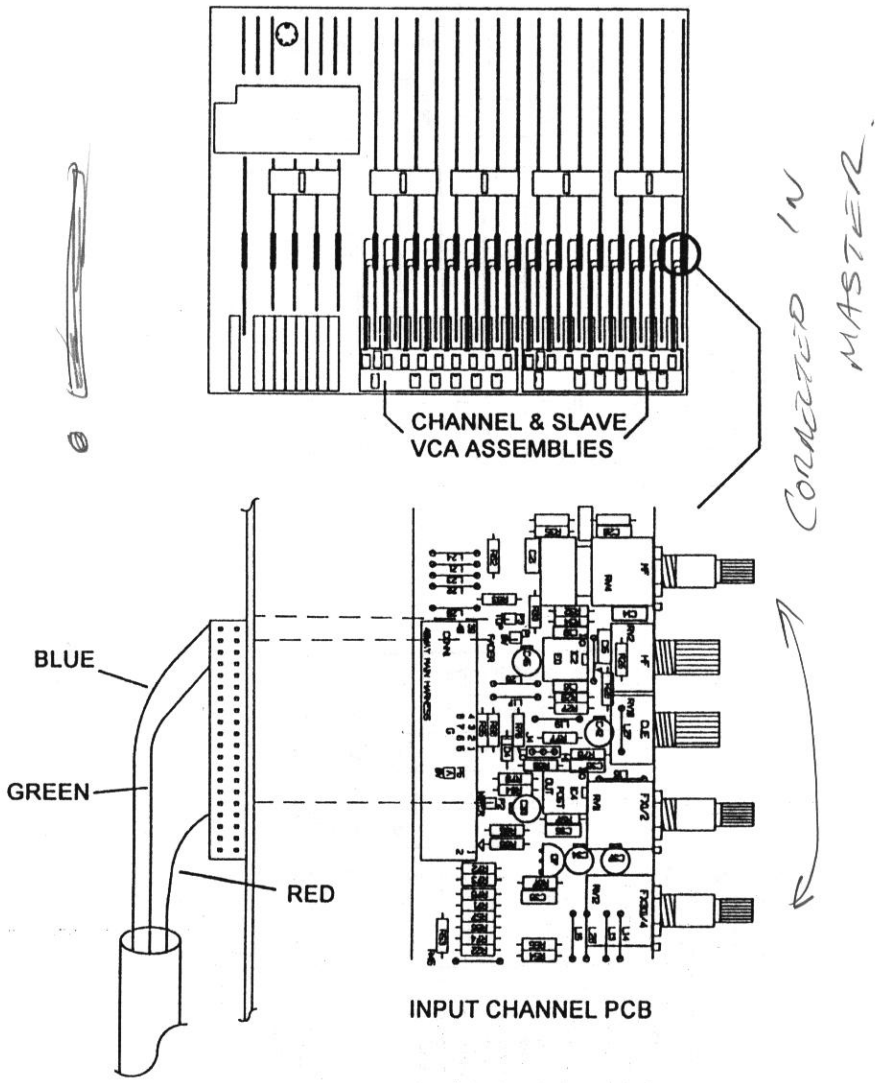
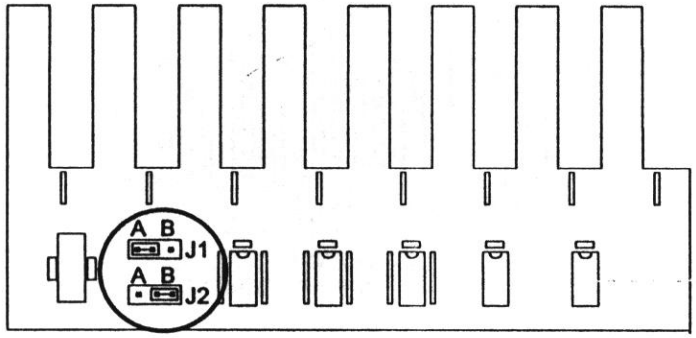


Fig. 9.
Fitting Channel VCA PCBs.

5. The VCA Slave PCBs & Channel VCA PCBs must now be assigned using the jumper links on the PCBs, *see Fig. 10.* Assign the PCBs as follows:

For the VCA Slave PCBs:

Console Channels	link J1	link J2
1 to 8	position A	position B
9 to 16	position B	position A
17 to 24	position A	position B
25 to 32	position B	position A



For the Channel VCA PCBs:

Console Channels	link J1
1 to 8	position A
9 to 16	position B
17 to 24	position A
25 to 32	position B

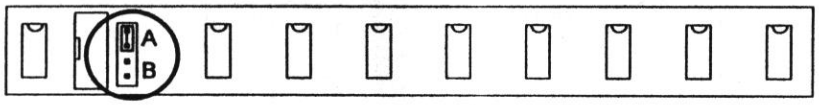


Fig. 10a & 10b.
Assigning the VCA slave PCBs & the Channel VCA PCBs.

STAGE 5 - INSTALLING NEW MICROPROCESSOR AND KEYBOARD

1. Unpack the Keyboard PCB (PCB No: AG0332) in the kit, and place along side the Master PCB. Solder the longer Red, Green & Blue fader wires from the Keyboard PCB to the left Master fader as shown, *see Fig 11a*.

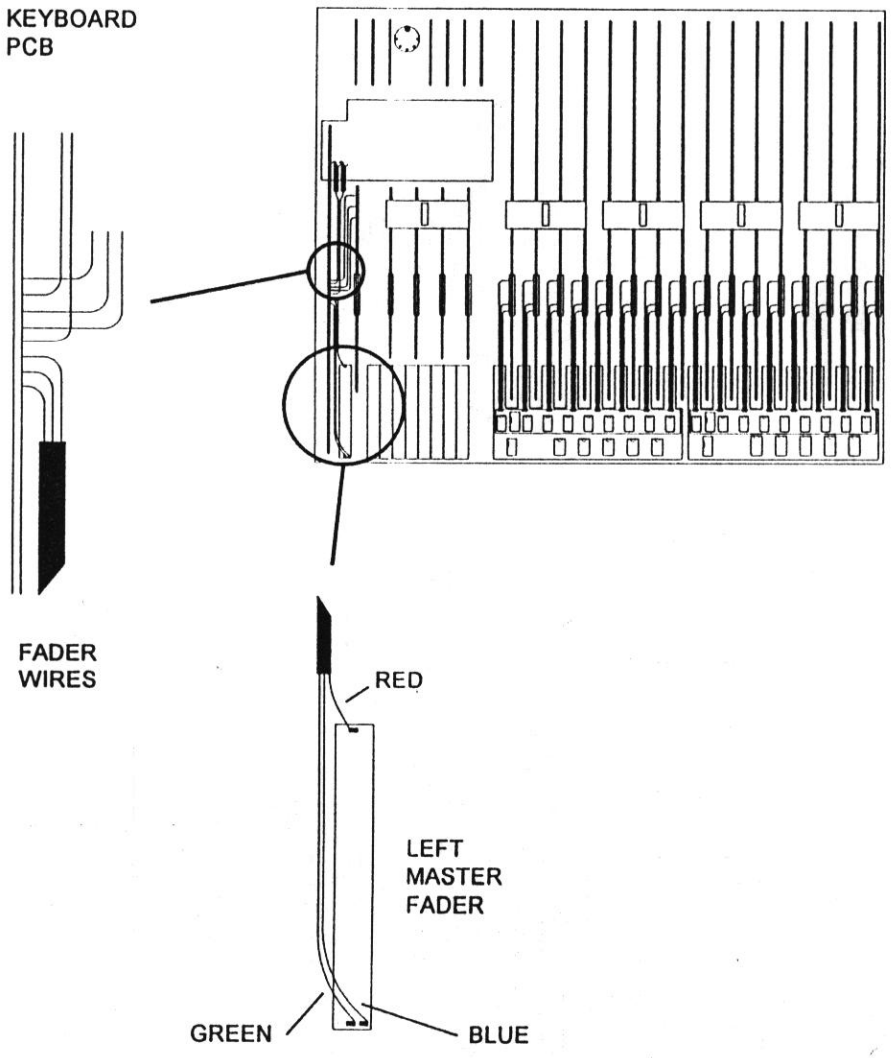


Fig. 11a.
Connecting the Keyboard PCB to the fader.

2. Solder the shorter Red, Green & Blue wires from the Keyboard PCB onto the Master PCB as shown, *see Fig. 11b*.

3. Locate the Red (R) and Blue (B) wires that were previously wired to the top of the left & right Master faders. Cut off a length approx. 150mm from the end of each wire. (150mm is roughly the width of this page). Strip & tin the ends of the remaining wires. Solder both wires into the Keyboard PCB as shown. *see Fig.11b*.

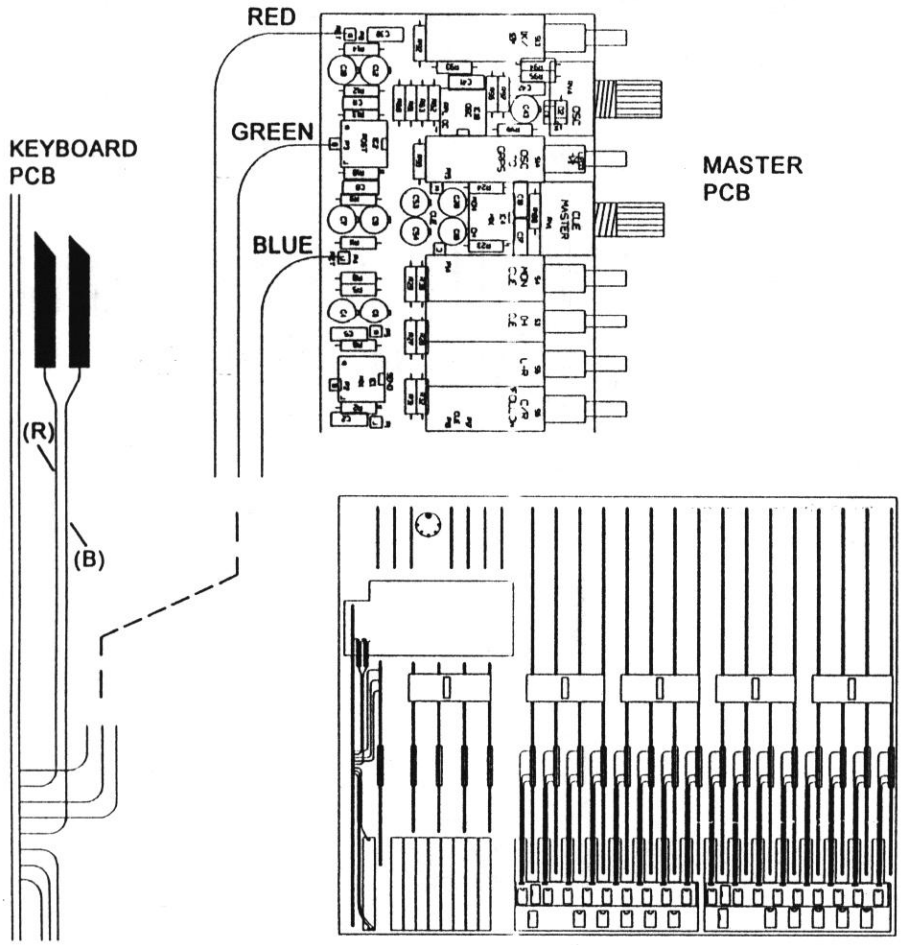


Fig. 11b.
Connecting the Keyboard PCB to the Master PCB.

4. Move the console, so that the Keyboard PCB overhangs your work surface, to gain access to the Keyboard PCB mounting screws. Mount the Keyboard PCB into the position of the old Mute Processor PCB as follows. Fix the PCB into place by inserting the brown 8-way connector (CON 1) onto the Meter PCB connector. Using the two countersunk screws from stage 1, secure the Keyboard PCB into place by tightening the countersunk screws (A) through the front panel into the black plastic joint blocks (B) mounted on the Keyboard PCB. *see Fig. 12.*

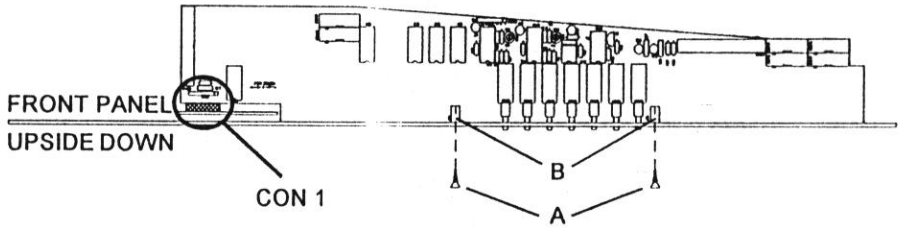


Fig. 12.
Installing the Keyboard PCB.

5. Unpack the V-Micro PCB (PCB No: AG0330) from the kit. Unscrew the jack nut from the jack socket on the PCB. Mount the PCB onto the front panel and secure it using the jack nut (A) and the 4AB x 3/16 black countersunk screw (B) provided. Plug the other end of the switch harness into the Keyboard PCB connector CON8; *see Fig. 13.*

6. Locate pin 1 of the 5-pin XLR power connector and desolder the Black wire (A); see *Fig 14.* Solder the end of the Black wire to the other end of the Black wire that was attached to the V-Micro PCB. Solder the joined wires back into pin 1 of the XLR.

7. Solder the red & green wires from the 5-pin XLR power connector onto the V-Micro PCB holes labelled CON7 as shown in *see Fig. 13.*

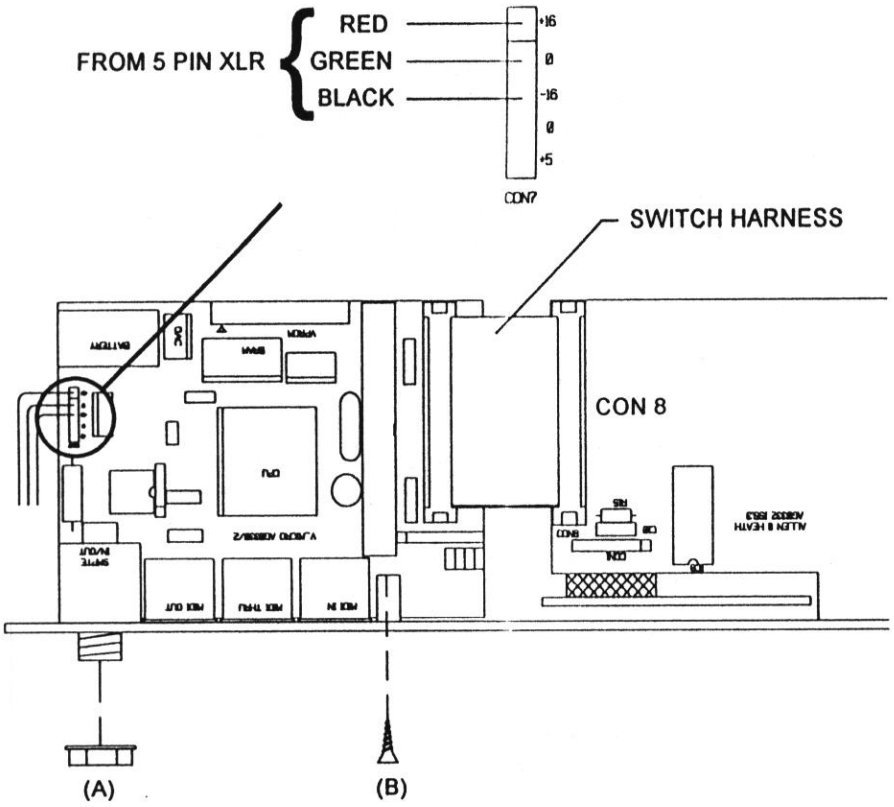


Fig. 13.
Installing the v-micro PCB.

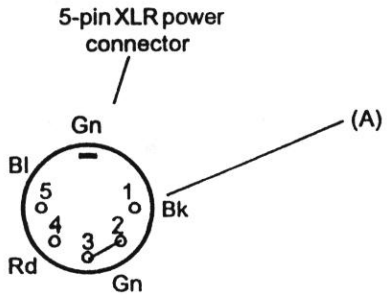


Fig. 14.
Soldering the black wire to the power connector.

8. Locate the M3 screw (A) on the Meter PCB and unscrew it. *see Fig. 15.* Unpack the two M3 x 25mm pillar screws (B) in the kit and use them to mount the VPROM PCB (C) and SMPTE PCB (D) firmly to the Meter PCB as shown.

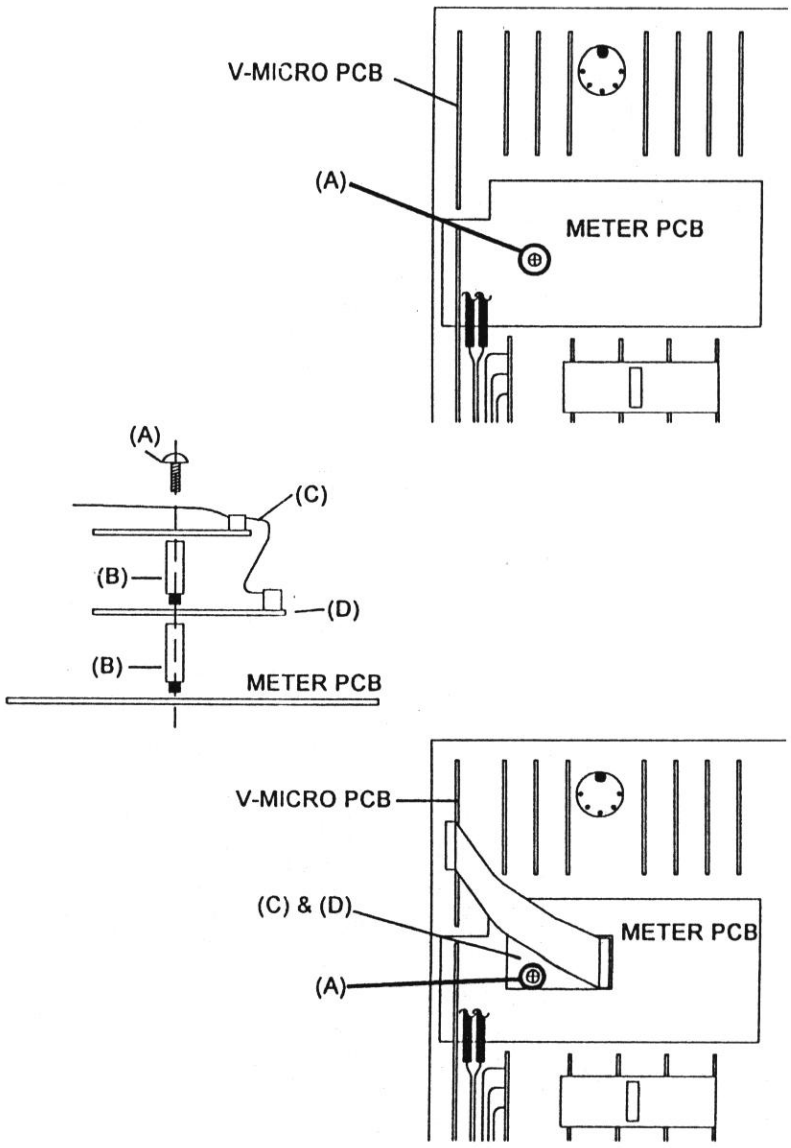


Fig. 15.
Fixing the VPROM & SMPTE PCBs.

Stage 6 - Fitting Harnesses

1. Plug the other end of the VCA harness, that was connected to the Keyboard PCB, into connector CON5 on the V-Micro PCB, as shown. *see Fig. 16.*

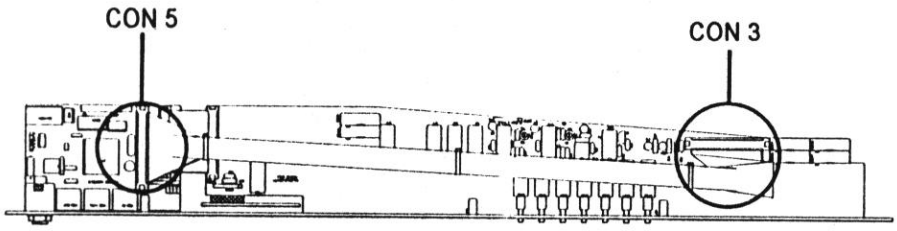


Fig. 16.
Fitting the VCA harness

2. Unpack the VCA Slave Harnesses from the kit. Plug the harnesses into the connectors labelled CON1 (A) on the VCA Slave PCBs and onto the connectors (B) on the Channel VCA PCBs. Connect the ends of the harnesses to CON4 (C) and CON5 (D) on the Keyboard PCB as shown. *see Fig. 17.*

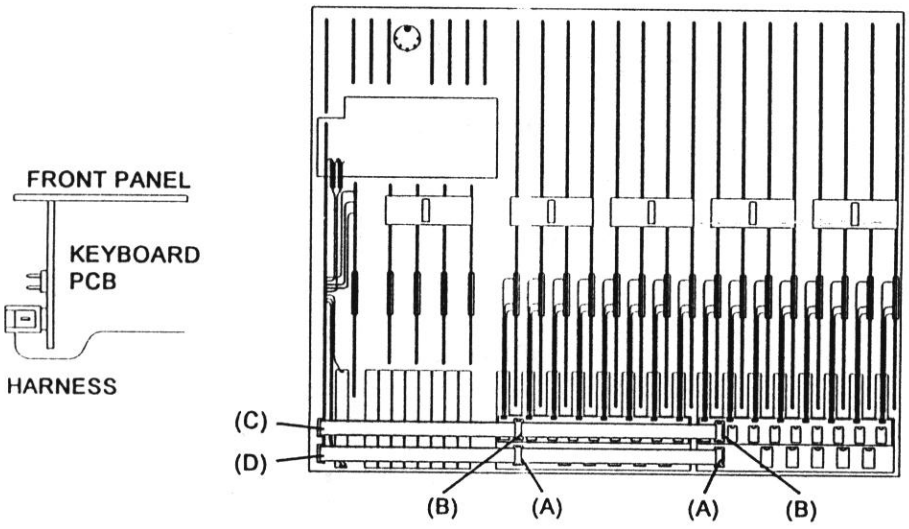


Fig. 17.
Fitting the VCA Slave & Channel harnesses.

3. If you are upgrading a 24 or 32 Channel GS3 unpack the VCA Slave Expander harnesses (A) and fit them to CON6 (B) and CON7 (C) on the Keyboard PCB as shown. *see Fig. 18.*

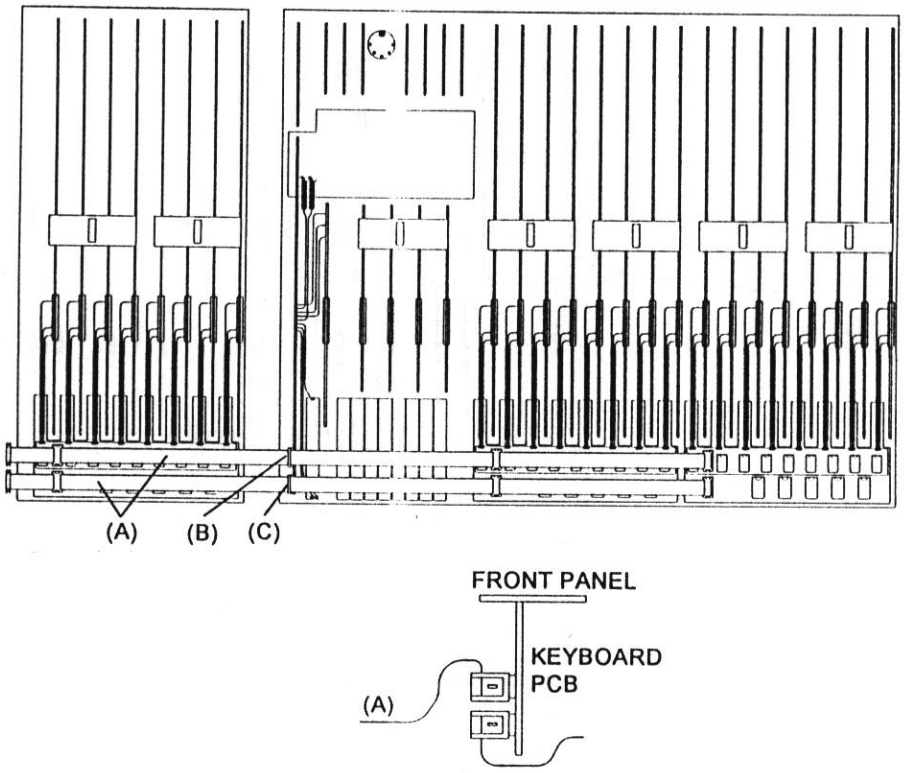


Fig. 18.
Fitting the VCA Slave & Channel harnesses to an X8 expander.

4. Unpack the Mute Slave harness (A) in the kit. Plug the harness into the mute slave connectors (B), and into connector CON9 (C) on the Keyboard PCB as shown. *see Fig. 19.* Refit new cable ties around each mute slave connector and mute slave PCB.

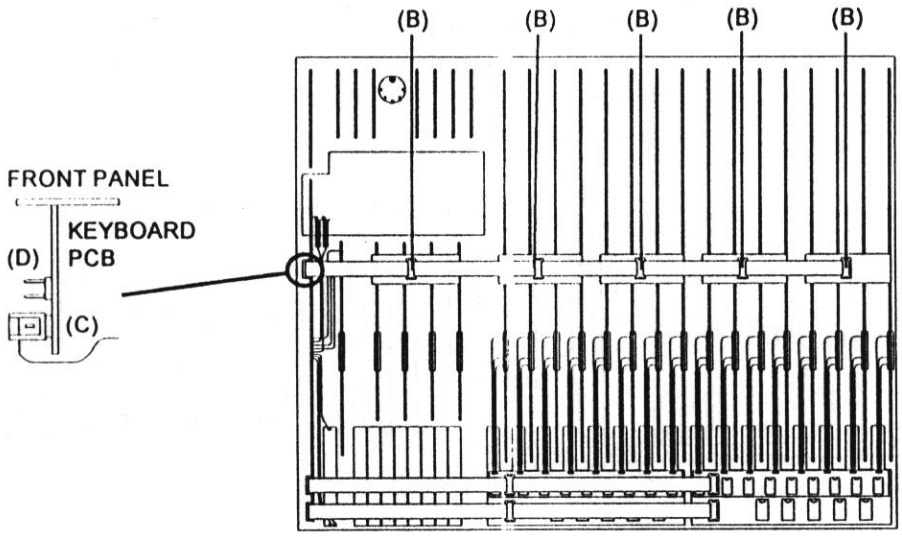


Fig. 19.
Fitting the Mute Slave harness.

If you are upgrading a 24 or 32 channel GS3, plug the Mute Slave Expander harness into connector CON10 (D) on the Keyboard PCB.

5. Re-fit the 40 way main ribbon harness (A) as shown. *see Fig. 20.*

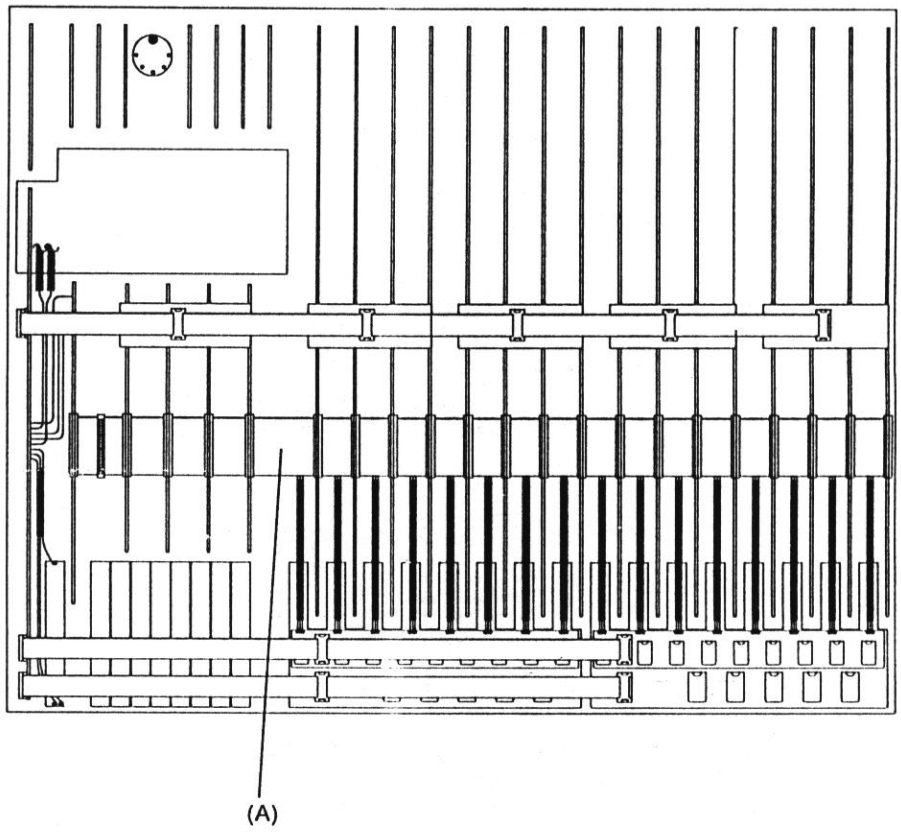


Fig. 20.
Refitting the 40 way main ribbon harness.

Stage 5:- RE-ASSEMBLING THE CONSOLE.

1. Place the rear extrusion close to the console and screw the green earth wire to it. Offer up the front & rear extrusions so that the console front panel slots into the extrusion slots. Take care not to scratch the front panel.
2. Position the side trims next to the console and screw them to the extrusions using the M6 Hex screws.
3. Turn the console up the right way. Fit the fader knobs on to the fader shafts. When fitting the fader knobs ensure that the fader shaft is at the bottom of it's travel to prevent stress on the fader body.
4. Unpack the adhesive sticker in the kit of parts. Carefully stick it onto the automation strip on the right hand side of the front panel as shown. *see fig. 21.*
5. Before fitting the console base carry out the SYSTEM CHECKS described in the next section of this manual. To refit the console base turn the console upside down again. Make sure that the foam rubber pads on the base are positioned over the mute slave PCBs. Screw the base into place.

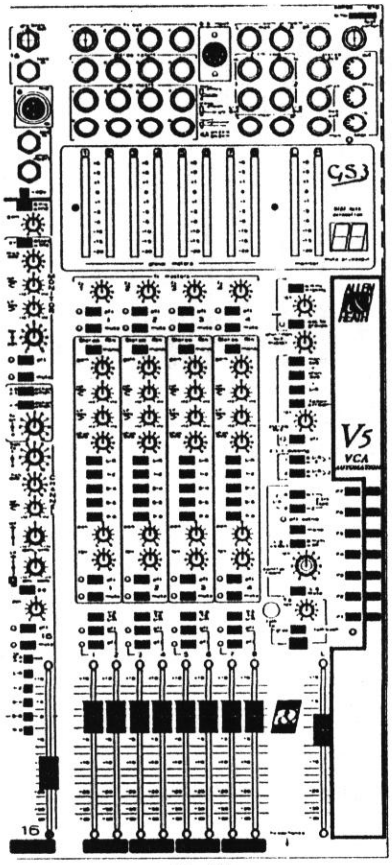


Fig. 21.
Fitting the V5 Automation label.

SYSTEM CHECK

1. While holding down the Function Key 6, power on the console. This will perform a hard reset for the on-board computer.

Problem
If the red PFL ACTIVE LED on the master panel is on, and all the console PFL switches are off.

Check-
Check that the main 40 way console harness is correctly fitted, i.e. no misaligned connectors, bent connector pins; see page 23.

2. Check that the display shows a steady 0.

Problem
If the display is blank.
Check
Check that the keyboard connector CON1 is connected to the Meter PCB connector, see page 17.
Check that the small Switch Harness is correctly fitted between the Keyboard PCB (CON 8) and the V-Micro PCB; see page 18.
Check that the power supply wires are correctly fitted to the V-Micro PCB; see page 17 & 18.

3. Check that all of the mutes are functioning correctly by turning them on & off.

Problem
If a single mute or a group of mutes dont work.
Check
Check that the Mute Slave Harness connectors are correctly fitted to the Mute Slave PCB connectors, i.e. no misaligned connectors or bent pins; see page 22.
Check that the Mute Slave PCBs are correctly mounted onto the Channel PCB connectors.

Problem
If all of the mutes dont work.
Check
Check that the Mute Slave Harness connectors are correctly fitted to the Keyboard PCB connectors, i.e. no misaligned connectors or bent pins; see page 22.

4. Use the console's internal oscillator to check that the L/R master fader is functioning correctly as follows:

- Depress the 'OSC TO GROUPS' switch on the master panel.
- Raise Group faders 1 & 2 to the 0bB mark.
- adjust the oscillator level until the Group Meters 1 & 2 display 0VU.
- Route Group Faders 1 & 2 to the LR mix bus by depressing the '1-2 TO L-R' switch above the Group Faders.
- Raise the L/R master fader to the 0dB mark. The L/R Meters should display 0VU. Move the L/R Master Fader to the -10dB mark. The L/R Meters should now display -10VU.

Problem
If there is no control over the LR level.
Check
Check there are no PFLs currently acive on the console.
Check that the LR to 2 TRACK routing buttons on the master panel are not depressed.
Check that the VCA Harness is correctly fitted between the Keyboard PCB and the V-Micro PCB; see page 20.
Check that the wiring from the LR Master Fader to the Keyboard PCB, and from the Keyboard PCB to the Master PCB are correct; see page 15, 16.

Problem
If the level on the L and/or R Meters is 10dB too high.
Check
Check the gain modification resistor on the Master PCB is correctly fitted; see page 10.

5. Now use the console's internal oscillator to check that all of the channel faders are functioning correctly as follows:

- Plug one end of a 1/4" mono jack lead into Group Insert 1. The level on Group Meter 1 will disappear. Deselect the '1-2 TO L-R' group routing switch.
- Plug the other end of the lead into the Line Input on Channel 1. Check that the 'MIC/LINE' switch is depressed, the monitor 'REV' switch is up, and that the Channel EQ switch is up.
- Press the PFL switch above the Channel Fader. Set the Channel Input gain until the LR Meters read 0VU. Deselect the PFL switch.
- Route the channel to the L-R bus with the pan control set to the centre. Raise the channel fader to the 0dB position. The L-R meter should be reading 0VU (with the LR Master Fader at 0dB position). Move the channel fader to the -10dB position. The LR Meter should be reading -10VU.
- Repeat the above procedure for all Input Channels.

Problem
If none of the channel faders are working.
Check
Check that the VCA Slave Harnesses are correctly fitted to the Keyboard PCB, see page 22, 21.
Check that the VCA Slave and Channel VCA PCBs have been correctly assigned; see page 13.

Problem
If a group of the channel faders (i.e. channels 1 to 8 or 9 to 16) are not working.
Check
Check that the VCA Slave Harnesses are correctly fitted to the VCA Slave and Channel VCA PCBs;see page 20.
Problem
If one of the channel faders is not working.
Check
Check the wiring of the three wires from the Channel VCA PCBs to the Input Channel PCBs; see page 13.

Problem
If the level on the LR Meters is 10dB too high.
Check
Check the gain modification resistor on the Input Channel PCB is correctly fitted; see page 9.