

POWERVCA-LC

Installation

MANUAL



Smart in Solutions

POWERVCA INSTALLATION

(for retrofit purposes only)

Chapter 1

Introduction

This Powervca Automation installation manual is provided to help assure simple, efficient, correct installation and to serve as a technical reference guide describing the functional operation of the entire system.

This manual is organised into six chapters:

- o Introduction:
quick overview of the system and installation
- o Pre-installation Planning:
issues to be resolved before installation
- o Hardware reference guide:
detailed technical discussion of how the system works
- o Installation:
instructions for system hardware and software installation
- o System testing:
verification that the system is performing properly
- o Troubleshooting:
a guide to solving system problems

System Hardware Overview

The Powervca Automation System is composed of the following major hardware components:

- o VCA/Motorized fader modules
- o Mode selector switches
- o Connector cables
- o 8 channel multiplex cards
- o CPU card
- o Power interface card
- o SMPTE plug in PC card
- o Power supply.
- o wiring cables
- o Installation manual/users manual
- o Optional IBM AT compatible computer

INTRODUCTION

These major components are interconnected using the following types of wiring

- o 20 pole ribbon cable between VCA cards and Mux cards
- o 34 pole ribbon cable between Mux cards and CPU card
- o 34 pole ribbon cable between CPU card and back panel interface card
- o 1 roll of one conductor cable to create star ground system in console for VCA cards

Due to console Peculiarities such as bulkheads and partitions inside of the console, it may be necessary to fabricate some or all of the system wiring during the actual installation

For this reason, we offer either pre-assembled wiring kits or a kit of wire and connectors.

The pre-assembled wiring kits are intended for use in those consoles which do not have any obstacles such as partitions between any of the automated modules, or those that can be modified to accommodate the automation system

WIRING.

Each group of 8 adjacent interconnected faders is called a bank Each of the individual fader modules in such a bank is connected to the MUX card.

Each MUX card is connected to the next MUX card by 34 pole ribbon cable which provides the Mux cards with power, ground and all digital data.

These 34 pole ribbon cables need to be positioned underneath the MUX cards to minimise digital breakthrough in the audio.

The MUX cards need to be positioned as far away as possible from virtual ground mixing busses and other highly sensitive wiring inside your console.

There is always an example in the Powervca kit of a fully wired VCA card and mounting bracket. The standard pre-assembled wiring kit and the illustrations in this manual are designed for the wiring to enter the console at the right (as you face the console) side of the console.

A powerful feature of the Powervca Automation system is the availability of wiring of two extra switches. These switches may be used to activate console mutes and other switches, and to trigger external devices. The controlling is by way of pulses between 0/5 volt or 13/18 volts depending upon jumper settings and pre assigned for D&R consoles.

Due to the wide variety of console designs and the fact that it is quite common for console manufacturers to change the design of the mute circuitry, connectors, component values, component locations and connector locations, it is not practical for Powervca to provide pre-wired mutes. We do, however, provide schematic diagrams (on request) that illustrate mute circuitry which has been reported to perform properly. You may have to consult the manufacturer of your console for further recommendations concerning the wiring of mutes or other switch functions.

INTRODUCTION

OPERATION OF THE VCA BOARDS

PowerVCA uses THAT (dbx) VCAs voltage controlled gain amplifiers to control the audio level of each channel of the console. The VCA's replace the channel fader in the audio circuit of the console. The fader no longer directly controls the audio signal but a DC reference voltage supplied by POWERVCA. This voltage is recognised by the computer and used to measure the fader movements and the status of the mute button.

POWERVCA processes and stores these values, and provides a direct control current for each console VCA, thus controlling the audio gain of each channel.

When the computer is off the internal relay connects the fader to the audio circuit of the console, isolating the VCA from the circuit.

DESCRIPTION OF A VCA

Each VCA consists of 4 separate circuits:

- An audio circuit using a DBX VCA integrated circuit (IC 1 circuit) and an NE 5532 low-noise audio amplifier (circuit IC3a) mounted to obtain a unity gain with a 0 volt control voltage. Optional potentiometer VR 1 is used to adjust the VCA distortion rate when THAT 2150 VCA's are installed,. The 2180 VCA's do not need trimming.
- A circuit receiving the DC voltage from the computer. This circuit includes a 6 dB per octave filter with a 30 Hz cut-off frequency (IC3B circuit)
- Mute connectors to control two sets of mutes (special wiring is necessary)

SYSTEM GROUND CONFIGURATION

The PowerVCA system was designed to preserve the original ground configuration of the console as much as possible and to avoid degrading of console performance and the ability to cut mutes.

The VCA board includes two separate grounds.

- Audio GND, the channel audio ground
- Digital GND, the POWERVCA ground

To preserve the audio performance of the desk each VCA circuit is connected to the corresponding channel fader ground by shielded wire.

The ground compensation circuit is specially designed to compensate the DC voltage difference between these two grounds

Fader audio

Each fader is provided with a three core interconnecting cable connected to the VCA card which needs to be as short as possible. The original fader wiring needs to be replaced by shielded cable if not already so.

Due to the wide variety of connector types, wiring locations and connector locations, the audio wiring and/or connector installation is performed during system installation.

INTRODUCTION

Installation of a 32 channel system may be completed in about 8 to 10 man-hours using the pre-assembled wiring kit, not including mute switch wiring. If the console is difficult to wire due to metal partitions or other obstructions between fader modules, the basic installation could require as much as 20 to 40 man-hours

For some automation ready systems, the mute wiring will add only an hour or two to installation. For difficult cases, some additional mute circuitry may have to be designed and built, and mute installation may require an additional 20 hours or more.

Computer Overview

To minimise studio down time the computer can be set-up and some preliminary testing performed outside the studio.

Beware... all computer systems are not created equal. Some particularly scary problems are far-east BIOS temperature problems affecting timing on the motherboard strange mouse drivers and incompatible adapter boards. Some super-VGA boards have been found to be incompatible with mouse drivers. Most bus mice won't work with the system.

In order to assist you in your computer selection without adding any overhead costs, we recommend that you use a type of computer system which we have tested and approved. Consult your sales representative

The automation system computer needs to meet the following specifications:

- o IBM AT 80386, or 80486 33 MHz compatible computer
- o 100mB hard disk
- o 5 1/4", 1.2 meg floppy disk
- o VGA graphics adapter
- o VGA monitor, color
- o Mouse or trackball (we recommend the 3-button G Mouse)
- o At least 1 megabyte of expanded memory.

The choice of mouse versus trackball is purely a matter of personal preference. The major advantage of the trackball is that it occupies a fixed location and doesn't have to be moved on a special mouse pad, and it can be operated easily on a sloping surface.

SMPTE /CONSOLE INTERFACE

One SMPTE coprocessor card must be installed.

The switches on the card have a default setting which is perfect for PowerVCA and must not be changed during installation!.

Power Supply

THE rack mounted power supply is designed to provide power for up to 40 (in some cases 48) modules.

Pre-installation Planning

CHAPTER 2

Planning the installation of your Powervca Automation system can greatly simplify the installation process and considerably reduce your studio downtime.

Components

The Powervca Automation System is composed of the following major hardware components:

- o VCA/Motorized fader modules
- o Mode selector switches
- o Connector cables
- o 8 channel multiplex cards
- o CPU card
- o Power interface card
- o SMPTE plug in PC card
- o Power supply.
- o wiring cables
- o Installation manual/users manual
- o Optional IBM AT compatible computer

The power and data cables to the system are designed to be installed from beneath or backpanels of the console. Many consoles have removable bottom panels located beneath the faders. However, if your console does not have a removable bottom, the console will require modification prior to the automation system installation.

MUTE switches

The automation system is able to control 2 switch functions on the console from each of the fader modules using 2 pin connectors. These 2 pin connectors are normally used to control the channel/monitor mutes of the console.

In the pre-installation planning, you need to determine what switching functions the switches will be used for and to test the switch interface circuitry to devices such as the mutes.

COMPUTER

For the computer, the major planning issues involve placement of the computer, monitor, keyboard, trackball (or mouse) and the automation data bus. The automation data bus has a maximum length of 10 meters (30 feet) from the back of the computer to the back panel interface power board.

The automation data bus wiring should be kept as far as possible from the audio wiring

The standard wiring kit requires that the computer be placed at the right side of the console (as viewed from the front of the console).

PRE INSTALLATION PLANNING

POWER SUPPLY

You need to decide where to put the power supply, and how to route the wiring. The Powervca Automation system provides a rack-mounted power supply for each 32 channels of automation. (In some cases, use of the power supply for up to 40 channels is approved.) The power supply is 2 HE high a full width 19 inch rack. Each bank of eight fader module MUX cards is connected to the power supply by a 34 pole ribbon cable

QUESTIONS TO ANSWER

The following list of questions summarises the decisions that need to be made prior to installation:

What will the switch connectors be used for?

Is the console bottom, beneath the faders, removable? If not, how can it be removed?

Is any additional Interface circuitry required for mutes or other switches?

Where will the computer, monitor, and keyboard be located?

Where will the automation data bus cable enter the console?

Where will the rack-mounted power supply be mounted?

Where will the power cables to the console to be routed?

Where will the power cables enter the console?

HARDWARE REFERENCE GUIDE

CHAPTER 3

Introduction

This chapter describes in detail the hardware components of the system. You should read this section thoroughly to become familiar with the system hardware before going on to Chapter 4, Installation. Then you can refer back to this section while reading the Installation chapter for specific information about your installation.

Fader Module

A Simple block diagram of the overall scheme of the system wiring is shown on the next page
Fader module connectors

The connectors provided for the power and data bus wiring are XLR type connectors and ribbon cable connectors.

The PowerVCA Automation system uses distributed data processing wiring technology.

The IBM AT compatible computer is the central processor interfacing with the CPU card in the PowerVCA automation through the plug in SMPTE card.

POWER SUPPLY

Verify that the proper voltage selection is made by the factory before applying AC power.

CAUTION: AC

An AC line fuse is included in the power input connector. For 100 or 120 volt AC operation, the fuse must be a 5 x 20 mm, 6 A, slow-blow.

For 220 or 240 vac operation, the fuse must be a 5 x 20 mm, 3 A, slow-blow. No other type of fuse should be used.

CAUTION:

The power supply enclosure should not be opened. Hazardous voltages are present inside. All service should be referred to qualified personnel

CAUTION:

To avoid hazardous conditions, do not subject the power supply to rain Avoid moisture or extreme moisture.

CAUTION:

For safety, the power supply must be connected to a properly grounded outlet using three-wire AC outlet using a suitable three-wire IEC/CEE linecord.

The POWERVCA System fader modules are powered by a rack mounted, central power supply which provides +18 and -18 volts DC.

An airspace of at least 1/2 inch (12 mm) must be provided above the power supply to assure proper air circulation.

HARDWARE REFERENCE GUIDE

Voltage selector

The internal voltage selector must be properly wired for the AC power line conditions. Failure to properly set the voltage selector may result in severe damage to the power supply and/or automation system. Such damage is NOT covered by my warranty express or implied.

To determine the proper voltage selector setting, the AC power line voltage should be measured at various times of the day in order to find what typical line voltage excursions will be encountered. We recommend the use of an accurate (better than +/- 1%), averaging type of AC voltmeter (NOT a so-called true-RMS meter) for the line voltage measurements. Based upon such line voltage measurements, as performed by qualified personnel, the voltage selector settings are to be as follows:

AC line voltage	Voltage Selector
87 to 110 vac	115 volt
104 to 132 vac	115 volt
191 to 240 vac	230 volt
208 to 264 vac	230 volt

Voltage excursions beyond the AC line voltages listed may cause damage and/or malfunctions to the power supply and/or automation system. The AC line fuse contained in the fuse drawer of the AC power inlet receptacle must be a 5 x 20 mm, slow-blow fuse:

AC line voltage	C Dower fuse rating
87 to 132 vac	Amp, slow-blow
191 to 264 vac	Amp, slow-blow

Use of any other fuse type or rating may result in safety hazards, may cause improper operation and will void all automation system warranties

DC Outputs

The +18 volt and -18 volt outputs from the power supply are used for the digital and analogue circuitry.

In no case should the power supply voltages be allowed to ever exceed 18 volts.)

Power requirements

Each fader module typically requires approximately 40 milli amps from the +18 and approximately 40 milli amps from the -18 volt supply. Our standard power supply is designed for use with 32 fader modules.

For a system with 48 modules, the typical total current is 1.6 amps from +12 volts.

It is of course quite rare in a real mix for all of the faders to simultaneously move at full speed and require full power. In general, the current from the +18 volt supply is very low, but the power supply and the wiring must be capable of handling large currents when required.

Power supply

The AC power on/off switch is located on the front panel. The off front panel position is labelled with the international symbol 0 (zero). The on position is labelled with the international symbol 1. F

Also located on the front panel are two red LED output voltage indicators.

If the +/-12 volt power supply is operating normally, the LED's will be illuminated. If the power supply is shut down due to an external short circuit, blown fuse or power supply failure, the LED's will be off.

HARDWARE REFERENCE GUIDE

Power Wiring

In order to simplify wiring and avoid massive power cables, the fader modules are powered in banks of 8 modules. The power distribution and digital data bus each use the same 34 pole ribbon cable for each bank of 8 fader modules.

In large installations extra Power supply parallel cables need to be run along the 34 pole ribbon cables.

D&R Electronica Weesp b.v. makes no claims or recommendations concerning power wiring and all responsibility for compliance with statutes and codes rests with the purchaser and/or installer.

The 22 AWG power distribution cable is designed for runs up to 12 meters (40 feet) maximum. For longer runs, a larger wire size is required. Contact D&R for specifics about wire size for runs longer than 12 meters (40 feet).

Grounding

The power distribution cable is not shielded but in extreme cases shielding helps to prevent noise from being coupled into the console or other nearby equipment. One end of the shield should be connected to system common at the power supply, the other end of the shield should be trimmed neatly and not connected to anything. This type of single point grounding of the shield is recommended to avoid ground loops and possible resultant hum problems.

The Power supplies output on an XLR type of connector (sometimes speak-on types) are to be connected to the backpanel connector panel enclosed in the PowerVCA package.

Power supply

The PowerVCA -model 2HE power supply is designed for use with up to 32 fader modules (in some cases 40). The power supply is intended to be mounted in a standard 19 inch rack.

Module wiring.

The fader module wiring is described in this section.

CAUTION:

Improper wiring of the system, a reversed connector, or a connector on the wrong pins may severely damage the fader control electronics and/or computer I/O board. Such damage is not covered by any warranty express or implied. All power distribution cables, bank bus cables and jumper settings links should be very carefully double checked before applying power to the system.

The bank bus interconnecting each bank of 8 fader modules carries the power and digital data bus signals to each of the modules. Mis wiring of the bank bus can damage or destroy the modules. The bank bus wire supplied with the system uses a grey 34 pole ribbon cable with a red stripe on one edge to help identify mis-wiring.

Audio noise

There are two possible types of audio noise which could be produced by prevention improper installation of the PowerVCA Automation system.

First, ground loops in the power supply and/or computer wiring could cause audio hum.

Second, improper routing of the audio wiring, power supply wiring or digital data bus could result in audio noise which might cause a ticking or whining sound.

HARDWARE REFERENCE GUIDE

Routing of wiring

The power and data bus wiring for the fader modules should be kept as far as possible from all audio wiring.

In a typical console installation, the audio wiring to/from the fader will be located at the top of the fader module. Therefore, to keep the power and data wiring as far from the audio as possible, we recommend that the power and data wiring be dressed neatly and fastened to the console chassis near the bottom of the fader, as far as possible from the audio wiring.

Grounding

Low frequency hum is most likely caused by ground loops involving the AC power grounding. In order to avoid ground loops in the power supply wiring, the PowerVCA fader modules do not connect their power ground to the console chassis. The ground reference for the power supply and the power wiring shield is created at the power supply only. The shield on the power supply wiring is only connected to ground at the power supply and, to prevent ground loops, must not be connected anywhere else. That is, one end of the power supply wiring shield is grounded at the power supply and the other end is left floating.

Audio wiring

Digital signals coupling to the audio wiring via stray capacitance could possibly cause audio noise. Whining or very fast buzzing could indicate that the fader driver printed circuit board is the source of the radiated signal. A ticking sound might indicate stray capacitive coupling to the digital data bus.

In many applications, the audio wiring does not require shielding. However, in high performance applications, the audio wiring to/from the fader should be shielded for the ultimate in low noise performance. The wiring shield should be connected to the central ground point of the console by using a star ground system.

Shielding materials

Copper braid, metallized heat-shrink tubing or aluminium foil should be satisfactory shielding materials.

If the audio wiring to the fader includes an unshielded in-line connector, such as a Molex connector with a plastic housing, the shielding should also cover the connector.

Check that each fader housing is connected to chassis ground.

All audio wiring should be kept as short and direct as possible. The audio wiring should be kept away from all of the fader module power and data connectors. The audio wiring should also be kept as far away from the circuit board in the fader module as possible.

CAUTION:

Static electricity can damage electronic circuitry.

During installation and maintenance of the PowerVCA automation systems, electricity can seriously damage components by static electricity. A static discharge which cannot even be felt by a person can cause permanent damage to the system. Some types of static damage will not result in immediate failure, but will gradually degrade performance, perhaps resulting in intermittent problems.

HARDWARE REFERENCE GUIDE

During system installation and/or maintenance, extreme caution should be exercised to avoid static electricity. Use an anti-static spray such as Staticide (available from computer supply or office supply stores) on floors, chairs and clothes. If the humidity is low, the use of a humidifier is recommended. For the best protection against static damage, we recommend that you wear a grounded wrist strap while handling components of the system.

Installation

In this section, the complete installation of a typical Powervca Automation system will be described. Our goal here is to present the steps which will lead to a successful fully operational system installation. These installation steps assume that you have become familiar with, and will refer to as needed, the technical details of the system which have been presented in the Hardware Reference Guide.

INSTALLATION

CHAPTER 4

Installation of the Powervca automation system consists of:

- o Setting up the computer and software
- o Installing the power supply
- o Installing the fader modules in the console
- o Wiring the system together

The following installation procedure is designed to minimise the down- time of your studio. To this goal, the computer and power supplies are installed and preliminary tested before the automated fader modules are installed.

Before beginning the installation, you should have resolved the issues raised in Chapter 2, Pre-Installation Planning.

Setting up Your Computer

First we'll accomplish the computer set up. The computer may be set up outside of the studio environment, if desired, to keep studio downtime to a minimum.

Specifications

The POWERVCA system requires an IBM-PC AT compatible computer. It must be an 80386, or preferable a 80486 with VGA color display, at least 1 meg of expanded memory (2 megs total system RAM), 2 serial and 1 parallel ports, a hard disk (28 ms access time max.), and a printer if you want to print track sheets. A pointing device (mouse or trackball) is highly recommended, although the system may be run without one.

Initial set-up

The first phase of computer set-up is to follow of the computer manufacturer's instructions for unpacking and set-up. On an 80486 computer, this often includes the installation of an expanded memory manager, such as QEMM386 by Quarterdeck or 386-to-the-Max by Oualitas. When the computer is happily running, you should install the trackball (or mouse) according to manufacturer's instructions.

Other items included in the initial set-up are:

Environment variables.

There are several DOS environment variables that can affect the operation of the system. In many cases, you will not need to set any of these, but they are available for special circumstances.

To set an environment variable, type

```
SET variable=number< ENTER>
```

Where "variable" refers to the environment variable you wish to set, and "number" refers to the value you wish to assign to the variable. To see what variables have been set, and are currently in effect, type

```
SET < ENTER >
```

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To remove an environment variable that has been set, type

```
SET variable=<ENTER>
```

Environment variables are all cleared when the computer is turned off, so variables that are useful are generally set automatically by the AUTOEXEC.BAT file. To do this, just include the individual SET commands in the AUTOEXEC.BAT file.

If an 80486 computer is used, a memory manager such as QEMM386 by Quarter-deck Systems is recommended to provide the expanded memory support without using a lot of conventional system memory .

Mouse driver

If you are using a mouse or trackball with the system, you must install the mouse driver software. If you have installed QEMM386, you can load the mouse driver software in high RAM to make the most amount of conventional system RAM available. Refer to the QEMM manual for this procedure.

CONFIG. SYS

You must have a FILES = statement in your CONFIG.SYS file. FILES =20 is the minimum value.

A typical CONFIG.SYS file might look like this (using QEMM386):

```
DEVICE=C:\QEMM\QEMM386.SYS RAM  
FILES=20  
BUFFERS=15
```

AUTOEXEC.BAT file

Normally an AUTOEX.BAT file is created. There are no special requirements for the Powervca system, but many installations set up AUTOEXEC.BAT to automatically run the MIX software when the system boots up after it has been turned on.

An example of an AUTOEXEC.BAT file with a mouse driver, the synchroniser search turned off, MIDI board search set to IBQS, and a monochrome screen display might look like this:

```
PATH=C:\DOS;C:\QEMM;C:\UTILITY  
PROMPT=SP$G  
C:\QEMM\LOADHI  
C:\DOS\YMOUSE.COM  
CD \Power  
Power
```

PC SMPTE BOARD

The Powervca system requires one SMPTE board

Install the board.

The SMPTE board can now be plugged into any 8- or 16-bit slot in the PC. Since it is a short board, you can plug it into any slot on the motherboard.

INSTALLATION

Connect the board.

There are several connectors on the back of the SMPTE board. These protrude out the back of the computer.

Plug the 9-pin to MIDI cable adapter supplied with the board into the 9-pin connector on the SMPTE board. Then you can connect the Midi 1 in/out connectors with the Midi in/out connectors of PowerVCA's power interface card separately supplied.

Connect the source of time code (typically the output of track 24 on the tape machine, or perhaps the output of a synchroniser) to the phono jack nearest to the 9-pin connector.

If you are using a synchroniser the recommended time code wiring is to connect the output of track 24 of the tape machine to BOTH the input of the SMPTE board (RCA phono jack nearest the 9-PIN connector) AND the master time code input of the synchroniser,

If you want to stripe tape from the automation system, plug a cable into the middle RCA phono jack on the board and connect it to the tape machine input (normally track 24) or patch bay to route to the tape machine input

The Powervca software will configure itself as much as it can, but there are some items you must customise for your installation. If you have not already done so, type Power to start the software. If you get the message "Bad command or file name", it means that you are not currently in the Power directory. If you installed the software on the C: hard disk, type c: < ENTER > , then CD \POWER < ENTER > . Now try typing POWER again.

When the System Configuration screen appears, type the letter 'O' or click the OK box with the mouse. Then type another 'o' or click the OK box with the mouse.

You will be using the Set-up menu screens to configure the system. Type 'S' (or click the word 'Set-up') to bring up the Set-up Menu. Then type the letter for the screen you want, or click the bar with the mouse to access the screen.

Hardware set-up

This screen appears on the Set-up menu. Fill in all the fields on this form. You will enter the number of faders modules installed, default time code information (only applies when striping tape from the automation system), and your facility name. The next time the program is started, the facility name will appear on the Automation Screen.

Exit the program

Now exit the program. When you net start the program, it will be set up the way you left it

This completes the set-up of the computer. After the rest of the installation is complete, you will verify that the computer as set-up works correctly with the attached hardware.

Installing the Hardware

The hardware installation consists of installing the Multiplex cards, CPU card and back panel power/interface board and the fader modules, the computer, and wiring them together.

CAUTION: before installing, wiring, or applying power to the power supply, carefully read the power supply portion, Technical Reference Guide. Improper installation of the power supply may cause damage to the power supply and/or the automated fader modules.

INSTALLATION

Damage caused by such power supply related installation errors is not covered by any warranty, express or implied.

Location

Each group of 32 faders has a rack-mounted power supply. The power supplies may be located remotely from the console. Since the power supplies are quite heavy, it is suggested that they be installed at the bottom of a rack. Ventilation space of at least 12 mm (1/2 inch) is required above the power supply for proper air circulation.

When the wires are installed and connected to the power supply, but before they are connected to the fader modules, turn on the power supply in order to test each and every connector for proper voltage.

Fader modules

A fader module consists of a VCA card or motorised fader with driver card and metalwork. Each VCA card has several connectors for connecting the VCA to the main channel board, the "original" audio taper fader, Mode switch, two mute connectors as well as jumpers for setting the mute control voltages.

Audio connections

The VCA card simply replaces the audio fader in the console. It is suggested that you install the same type of connector on the VCA card that was installed on the old audio fader.

We strongly suggest to use shielded cable to avoid digital noise entering the high impedance wiring of the fader cables.

If there was no connector installed, but the old fader was soldered in place, we suggest that you consider installing a connector to make it easier to remove the automation fader module for service. See Chapter 3 for technical information about avoiding audio noise problems.

Mutes and other switches

A powerful feature of the Powervca Automation system is the availability of two switches on each fader module. These switches may be used to activate console mutes, to control other console functions, or to trigger external devices.

The switch wiring is generally non-critical and may be 2 meter long, depending upon the characteristics of the device to be switched.

The connectors provided for the power and data wiring are 20 pole ribbon cables to be connected after installing the VCA cards underneath the channel modules between VCA cards and Mux boards

A small hole of 8mm needs to be drilled the fader panel to mount the mode switch if requested.

The mode switch has 4 solder tags two of these are for connecting the led (+/- inscription) the other two are the momentary switch contacts. All 4 wires need to be connected to the mode connector of the VCA card.

Each of the individual fader modules in such a fader bank is connected to the other modules via 34 pole ribbon cables and the individual star ground cable. Due to differences in various consoles, such as bulkheads and partitions, the 34 pole ribbon cable and ground wires may have to be modified or fabricated during the actual installation of each MUX card into the console.

INSTALLATION

Install all the MUX cards in a way that the 8 20 pole headers on the mux boards can easily reach the VCA cards mounted underneath the fader frontpanels.

Crimp mating connectors to the ground cable and install long ground wires from each VCA card to the central star ground point in the console.

Each mux board has one power distribution ribbon cable and a short digital data bus cable connected to it.

The digital data bus may be up to 4.5 meters (15 feet) long. In both cases, it is recommended that the wiring be as short as possible positioned underneath the MUX boards (put isolation PVC between MUX board and chassis) and kept at least two or three inches away from any audio wiring.

After you have mounted all Mode switches, VCA cards and Mux boards inside the console along with the wiring as indicated on drawing 4. Put the CPU card (the one with cooling fingers on it) and mount this device as far away as is possible from audio signals.

(Note: Audio and Computers do not like each other)

Plug the 34 pole ribbon cable going from each MUX board to the other MUX boards into the CPU card and run the final 34 pole ribbon cable from the CPU card to the Power interface card.

You need to find a good location where to mount the Power board to be able to connect the Power supply and the Computer easily to this card. It actually is the physical interface between console and computer/Power supply.

The wiring for the automation should now be complete. Do not apply power now. The system will be checked out first in chapter 5, Post-Installation Testing to prevent wiring errors from damaging the system.

Computer

By now the computer should have been set up, with the SMPTE plug in card installed and the Powervca software installed and configured. If not go back to the section above and complete the computer set up.

Location

The computer must be located within 10 meters of the most distant fader module, so that the digital data bus wiring will reach the back of the computer. The computer may be mounted under the console, or in a ventilated enclosure near the console. The floppy disk drives will have to be available for making backups.

Digital data bus.

After a location is selected, the Powervca Midi power connector wires must be connected to the SMPTE card plugged into the computer.

Please connect the midi out connector of the console interface card to the midi 1 in connector of the SMPTE card plugged into the computer earlier.

The Midi in connector of the console needs to be plugged in to the MIDI out 1 connector cable of the SMPTE card plugged into the computer.

INSTALLATION

For the system to operate, time code must be available to the SMPTE plug in card. This is often obtained from track 24 of the multi-track, or in some cases from the output of a synchroniser. The automation system will simply slave to any time code presented it. Connect the time code wire to the RCA phono jack nearest the 9-pin MIDI port on the MIDI board, at the rear of the computer,

If you are using a synchroniser with the system, we recommend that you connect the time code source (often track 24 of the tape machine) to BOTH the input of the SMPTE board (PCA jack nearest to the 9-pin MIDI connector) AND to the master time code input of the synchroniser,

If you desire, you can make the time code generated by the automation system available for striping tape. To do this connect a wire to the middle RCA phono jack on the MIDI board.

Mouse or trackball wiring

Plug the mouse or trackball into an unused serial port at the rear of the trackball wiring computer. Note that you may have to select a particular serial port to match the port selected with the mouse driver software. You may use a mouse extender cable if desired.

Keyboard wiring

Plug the keyboard into the keyboard port on the computer. You may use a keyboard extender cable if desired.

Monitor wiring

Plug the monitor into the computer monitor port. A monitor extension cable may be used.

Done

The computer is now set-up and ready for testing with the automation system.

SYSTEM TESTING

CHAPTER 5

This chapter will cover testing and verification that the system is functioning properly. First the power supply and wiring will be tested, then the fader modules will be checked out using the computer.

Power Supply

The worst possible installation error is to somehow apply the +/-18 volt power to anywhere else than it should be wired. Damage caused by wiring errors is not covered by any warranty, express or implied.

Wiring errors

ALWAYS, before applying power, double-check that all connectors are installed properly. It is quite possible to install a connector off by one pin and damage the system.

If any of the power supply and wiring tests do not check out, stop and correct the problem before going my further.

From experience, we suggest that after one person has hooked up all the connectors to the fader modules have mother person check that they are all hooked up properly.

Refer to figure ? while checking the wiring.

Power supply

Check once more that the power supply is set for the correct AC line voltage, and that it has the correct fuse installed. Make sure that NO power connectors are plugged onto any fader modules. Now turn on the AC power. Both the +/- 18 volt LED's lights should turn on and stay on.

Voltage check

Check that +18 and -18 volt DC and appear at the rear of the power supply interface card.

Turn OFF the power supply.

Install 20 pole ribbon cable connectors

Now the power/data connectors may be installed on the fader modules.

Install one power/data connector on each muxboard one at the time, and check for any wrongly inserted ribbon cable carefully.

Check power

Verify that all the power wires have been installed properly at the rear of the supply wiring and that no shorts are present.

Check all other connectors.

Power up the system

Computer System Check

Now you are ready to re-start the computer and check that everything is working. Make sure the power supply is turned on, and just as you did for the system set-up above, turn on the computer, change to the Power directory, and type Power < ENTER > to Start the program.

SYSTEM TESTING

Start-up screen

A box will appear showing you what hardware the program has found as it starts up. It should show you the number of faders that you actually have installed, whether or not a synchroniser has been found, the amount of mix memory available, and whether or not the MIDI co processor board was found.

If any of the information is not correct, stop NOW and correct the problem. Each item will be discussed in detail next. To bring up the Installation screen at any time, you can run the Initialise Hardware function on the Set-up menu.

Channels

You must see the correct number of channels found. If you do not, check the following

- 1) Power supply turned on
- 2) Data connectors installed properly
- 3) Jumpers installed properly on the MUX boards.

You can check all the modules to see if they are powered up and running by pressing the Mode buttons on the modules. The red LED should turn on and off when you do this.

SMPTE co-processor

The Powervca software will automatically search for the presence of the SMPTE board. This MUST be found to operate the automation system. If it cannot be found by the software, check that

- 1) The board is installed properly seated fully in its connector
- 2) The board's interrupt selection switch has been set to an unused interrupt (IRQ) and 3) The board's address switch setting is not conflicting with any other cards (such as a bus mouse card) in the computer.

Things to look for

Fader order

The first thing to observe is that the faders move in the correct order, from 1 to the last fader installed. If they do not, either a fader module is installed in the wrong position, the jumper on the fader module is set wrong, or the muxboard wires are plugged into the wrong ports on the back of the computer.

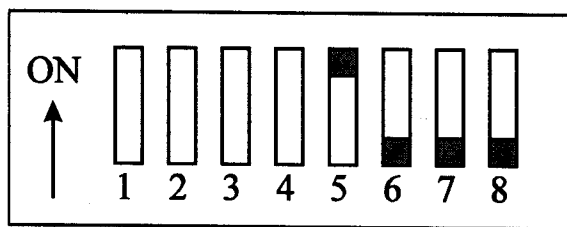
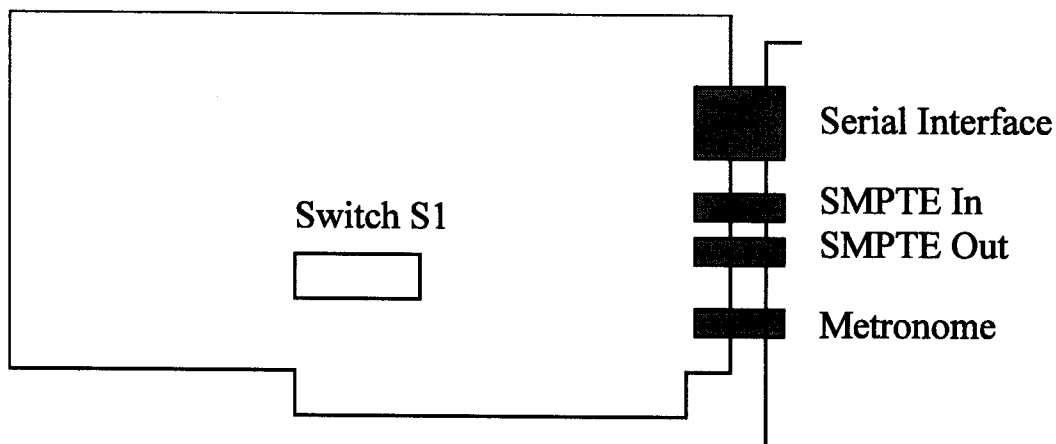
Machine Control window on the computer screen. You should also see time code moving while you rewind the tape, if your synchroniser and tape machine support this function.

Check-out Complete

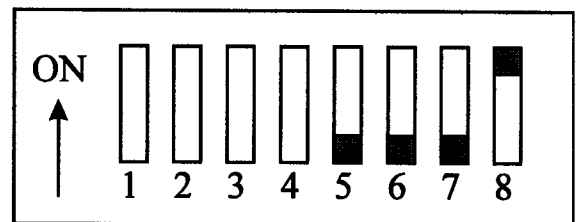
If the system has passed all the tests so far, it is in good working order.

If you want to start mixing right away, read the User's Manual section

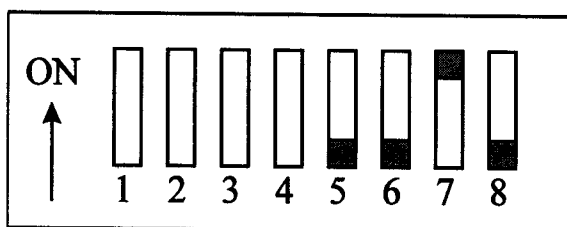
The MQX-32M's IRQ is set with dip switch S1 on the circuit board. Refer to the figure below for the location of S1.



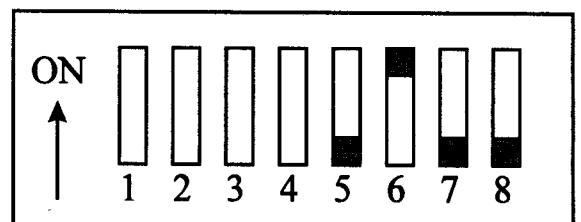
IRQ 2/9



IRQ 3



IRQ 5



IRQ 7

The IRQ is changed by moving the switches marked 5-8 on S1 to new positions for the IRQ you have selected.

Locate in the above drawn switch banks the IRQ you will use.

Then carefully slide switches 5-8 up or down as necessary to match the switch settings for the IRQ in the requested drawing

Trouble shooting

CHAPTER 6

Can't get a mix to start!

This indicates that time code is not being read by the SMPTE board.

To diagnose this problem, you must prove to yourself that real time code is reaching the SMPTE plug in card input. Try to patch the wire that plugs into the SMPTE board into the console and listen to the time code. If this appears OK, try another tape with known good time code. If the second tape works, re-stripe the first tape.

Disk Drive

If you get the message "Disk Drive Door may be Open" when you try to start the system, this could be caused by the Powervca program trying to read the A: or B: floppy disk drive. This could occur if the last time you left the program you had selected one of the floppy disk drives, for example if you were loading mixes from a floppy disk. The program remembers the last disk drive and directory you have selected and tries to move to it when you next start the program.

GLOSSARY

The highlighted box on the screen. The cursor may cover just one letter, or it may highlight a whole menu option. When you are in a field, the cursor indicates where what you type next goes. On a menu, it indicates the choice you will activate by pressing < ENTER > .

Cursor Movement Keys

The keys (such as arrow keys) that move the cursor around the screen.

EBU

European time code standard, similar to SMPTE, but running at 25 frames per second.

Field

A place to enter information.

File

A collection of related information stored on the disk.

Frame

Refers to video frame, 1/30th of a second (in the US). Also used to refer to a single time code number on audio tape.

Groups

A number of faders or mutes that act as one, moving in unison.

MUX card

Stands for input/output card. Refers to the printed circuit board that plugs into the VCA card and handles the input and output of data for the fader modules.

Menu

A list of options to select from.

Mouse

A pointing device with several buttons.

Mouse Pointer

Small arrow that moves when the mouse moves, used to select items on the screen.

Mute

To electronically silence a channel.

RAM

Random Access Memory. On a computer internal system memory. This is not disk space.

SMPTE

The type of time code used in the US that the system uses to keep track of when automation moves are made. A unique number is stored every frame.

The format of SMPTE time code is HH:MM: SS:FF, (hours: minutes: seconds: frames).

Synchroniser

The electronic equipment that reads time code from the tape machines connected to it. Also, it will synchronise two or more machines.

Time code

A system of storing a unique time number on video or audio to keep track of synchronisation.

Write Mode

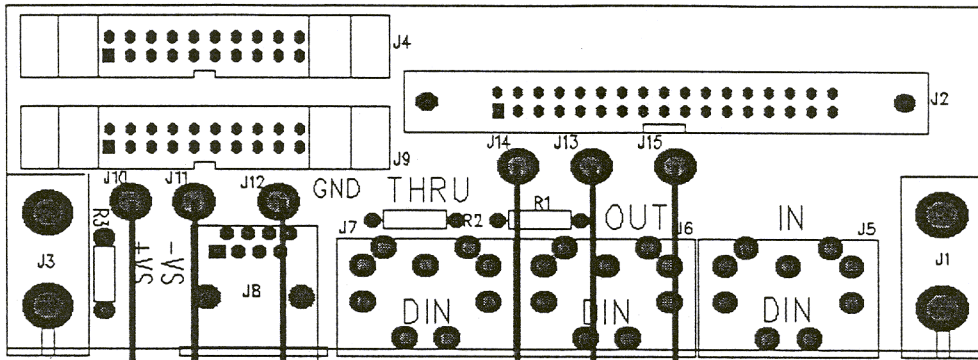
The automation mode where the fader's position is constantly being recorded, whether or not it is being touched.

**D&R Electronica Weesp b.v. Rijnkade 15B
1382 GS WEESP,
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Phone: 0031 294 418014
Fax: 0031 294 416 987
Website: <http://www.d-r.nl> E-mail: info@d-r.nl**

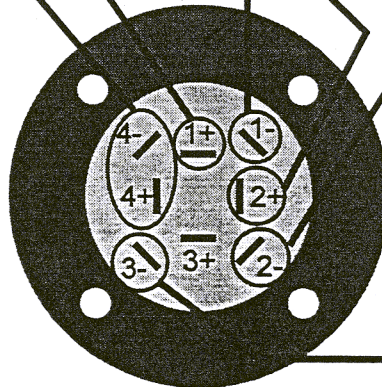
INSTALLATION POWERVCA BLOCK DIAGRAM

see inlay of installation page

TOP VIEW PCB LCAPWR_A



ROOD (2.5) +18V
BLAUW (2.5) -18V
ZWART (2.5) GND
PAARS (2.5) -12V
ORANJE (2.5) +12V
GEEL (2.5) GND LOGIC

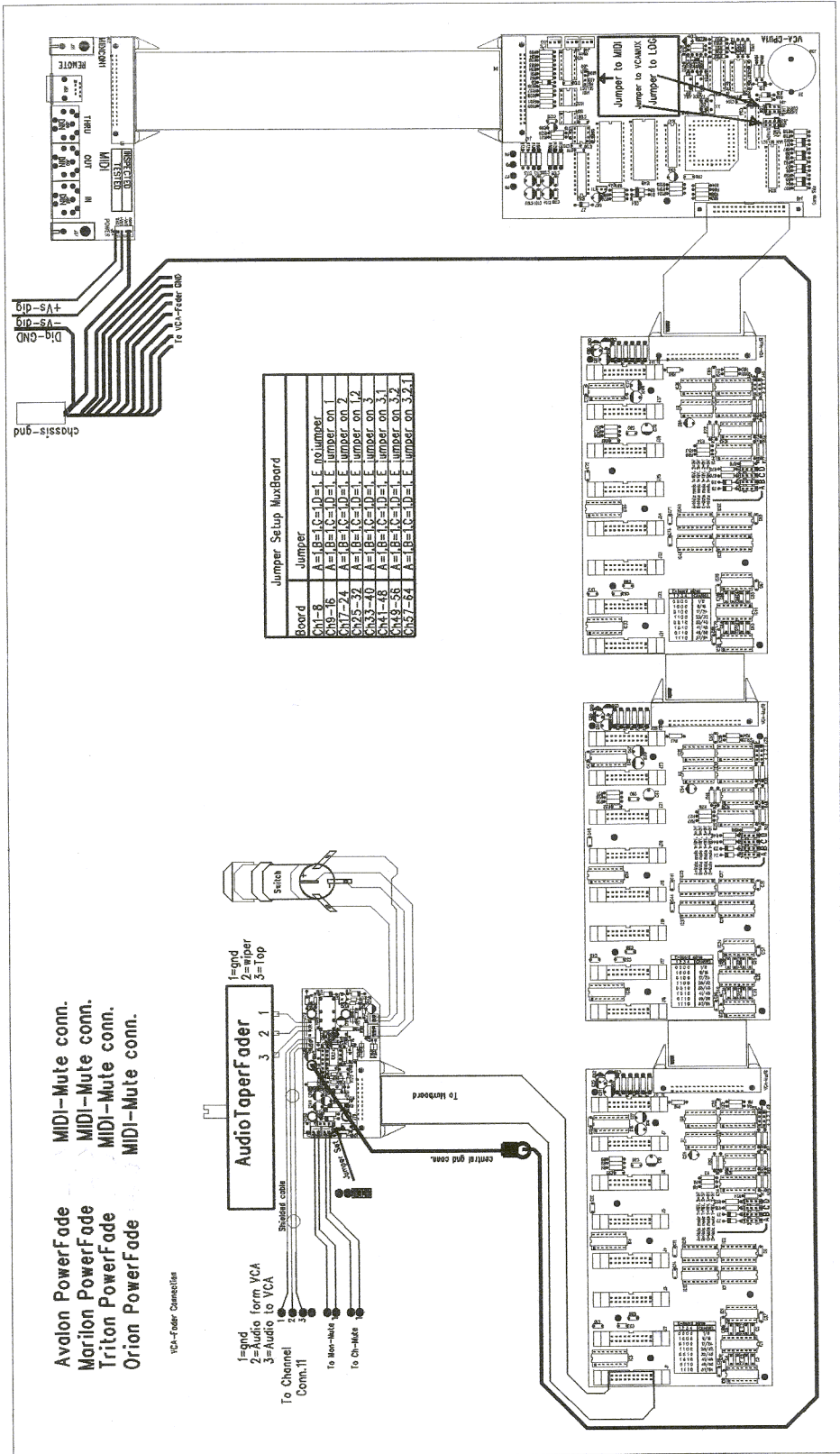


BACKVIEW
8P CHASSIS SPEAKON

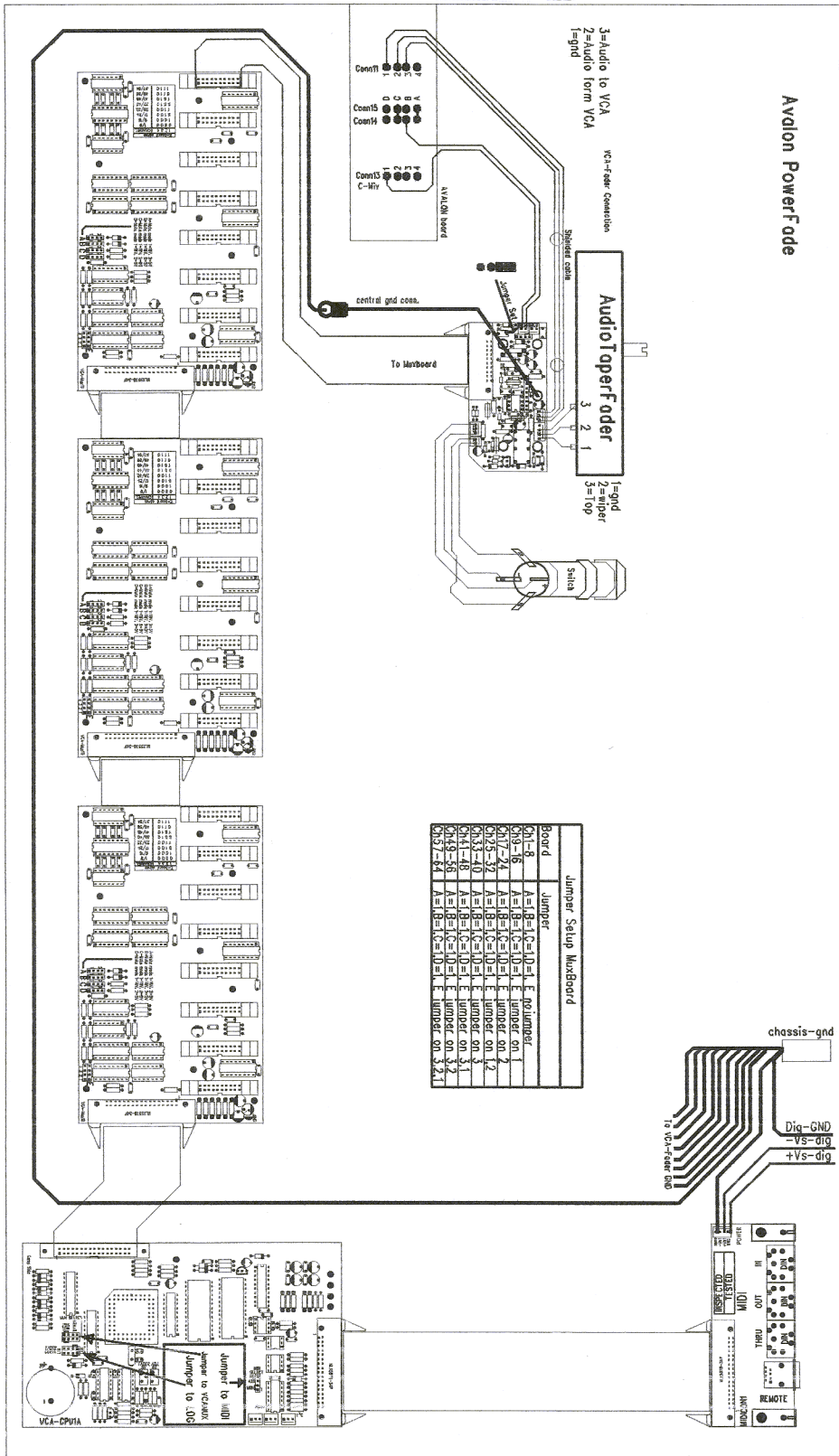
POWERVCA LC SPEAKON CONNECTION

AVALON POWERVCA BLOCK DIAGRAM

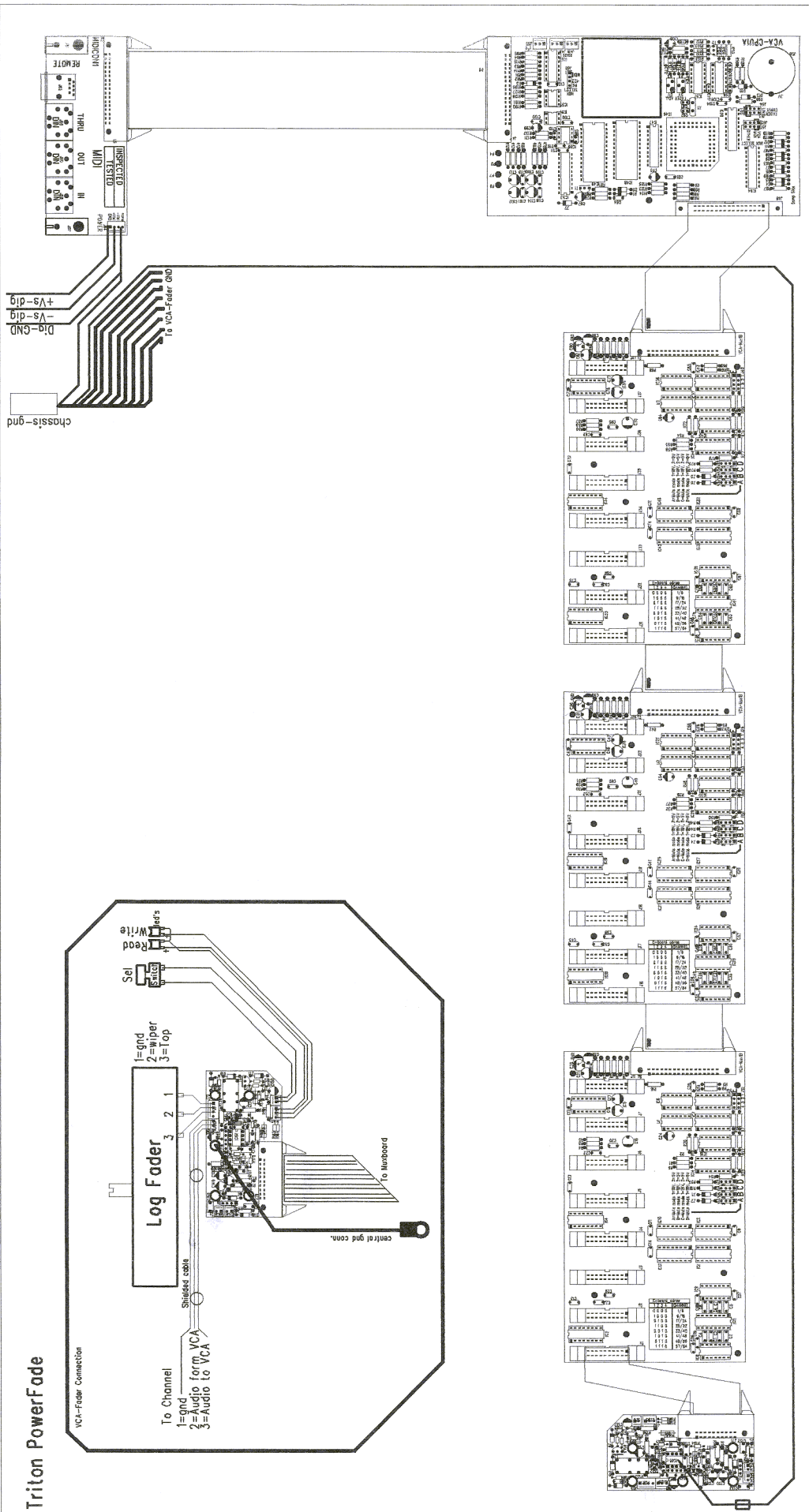
(with MIDI MUTE connectors)



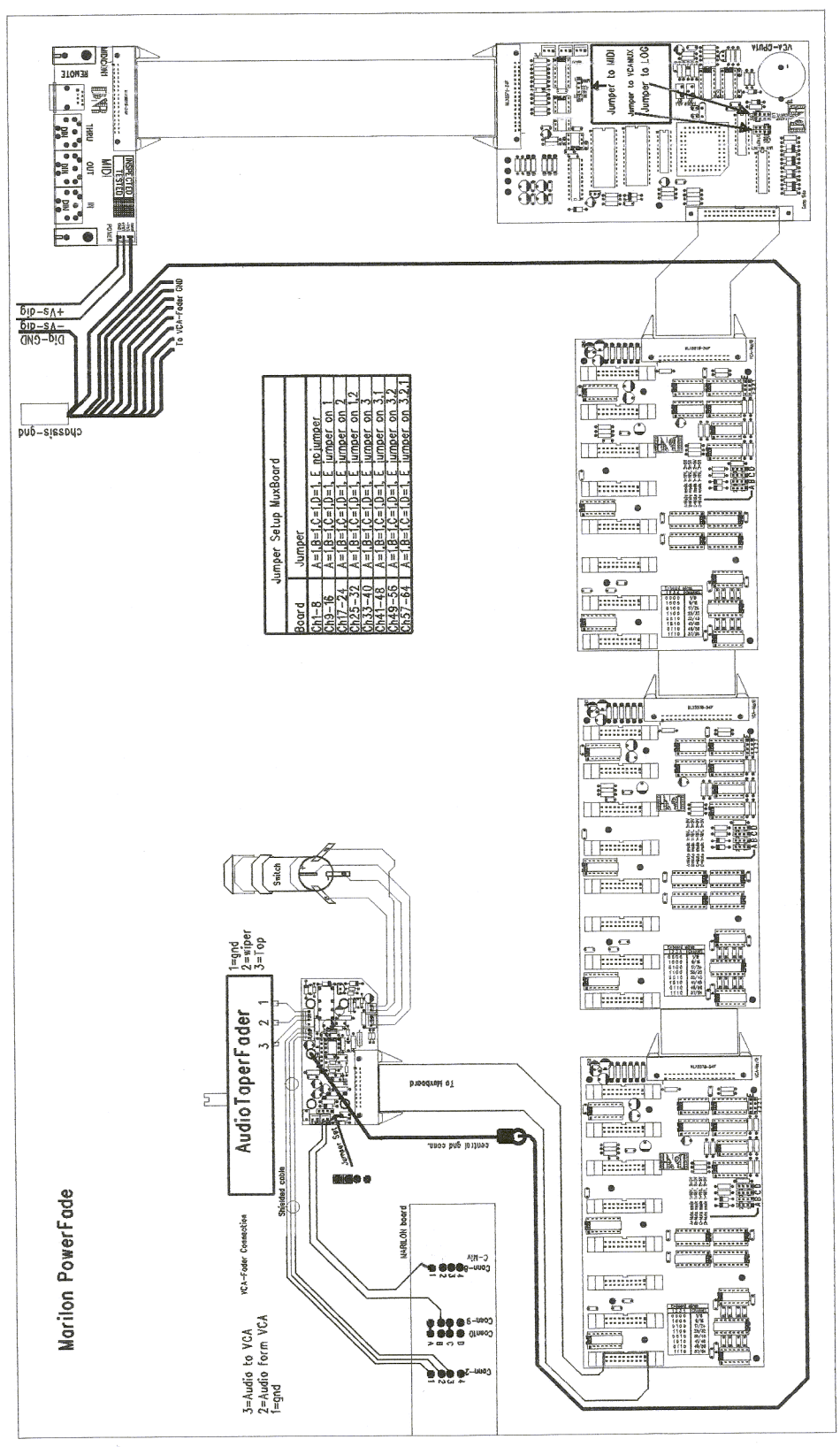
AVALON POWERVCA BLOCK DIAGRAM

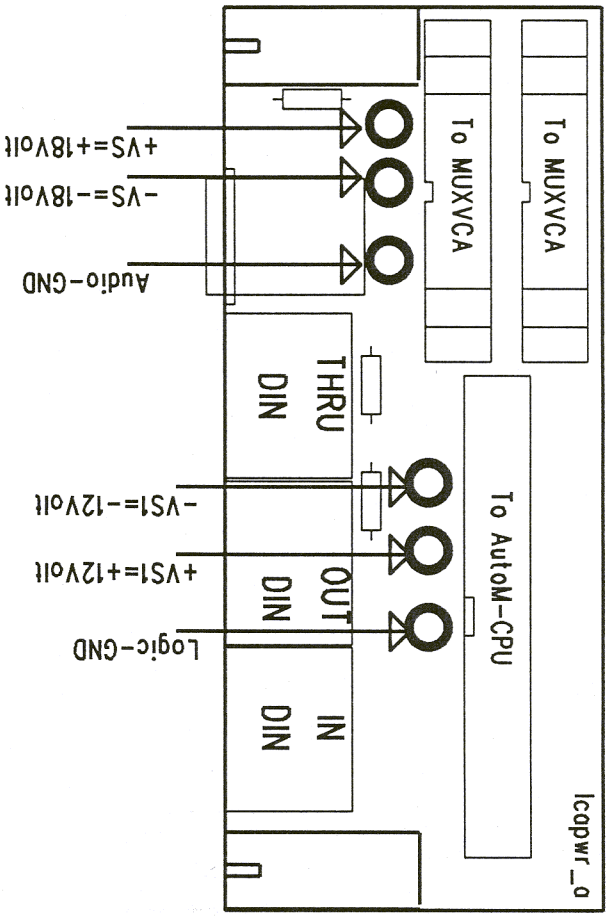


TRITON POWERVCA BLOCK DIAGRAM



MARILON POWERVCA BLOCK DIAGRAM





Power connection LC-Automation

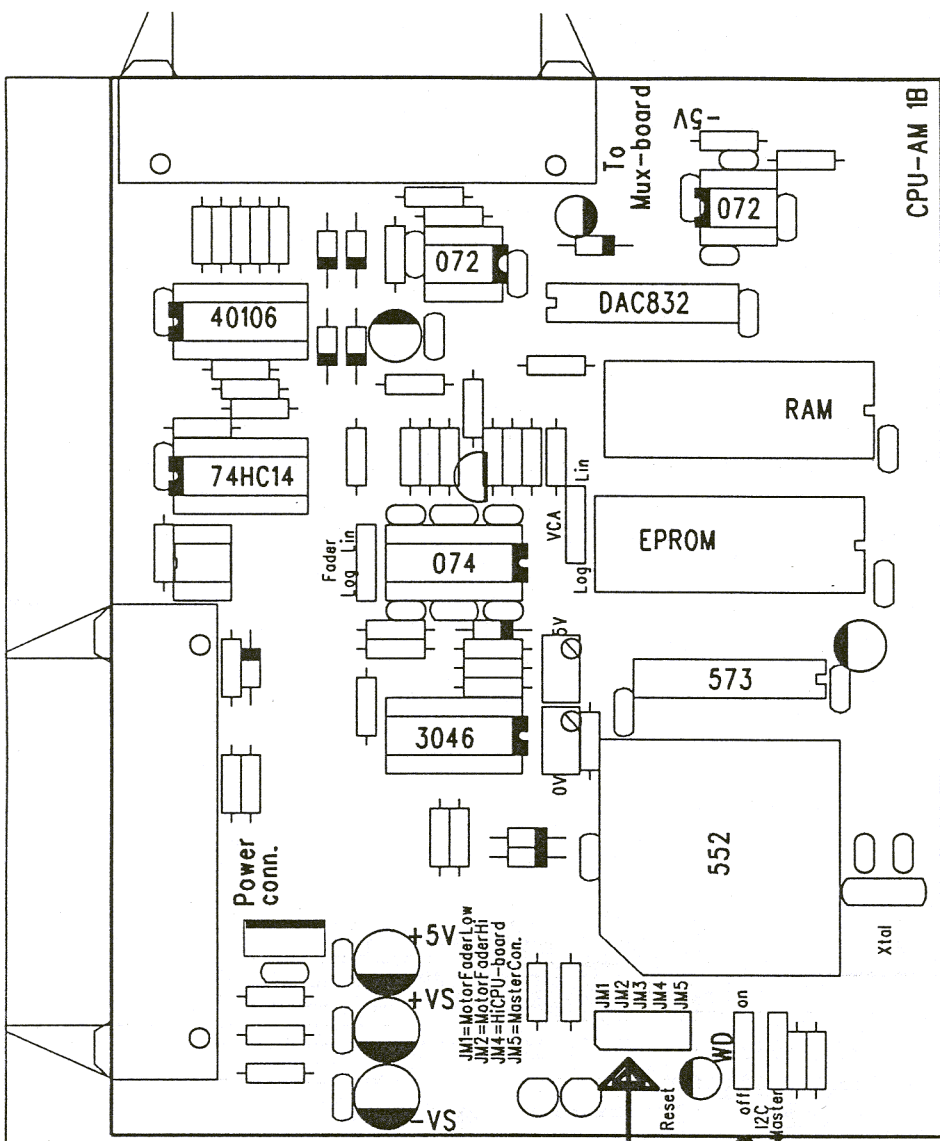
LCA AUTOM.

amount of channels	JM1	JM2	JM3	JM4	JM5
2	Yes	no	no	no	no
4	no	Yes	no	no	no
6	Yes	Yes	no	no	no
8	no	no	Yes	no	no
10	Yes	no	Yes	no	no
12	no	Yes	Yes	no	no
14	Yes	Yes	Yes	no	no
16	no	no	no	Yes	no
18	Yes	no	no	Yes	no
20	no	Yes	no	Yes	no
22	Yes	Yes	no	Yes	no
24	no	no	Yes	Yes	no
26	Yes	no	Yes	Yes	no
28	no	Yes	Yes	Yes	no
30	Yes	Yes	Yes	Yes	no
32	no	no	no	no	Yes

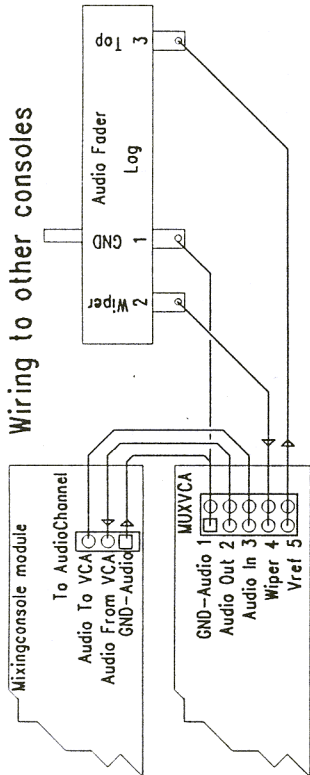
Determines the amount of automated channels

- JM 1
- JM 2
- JM 3
- JM 4
- JM 5

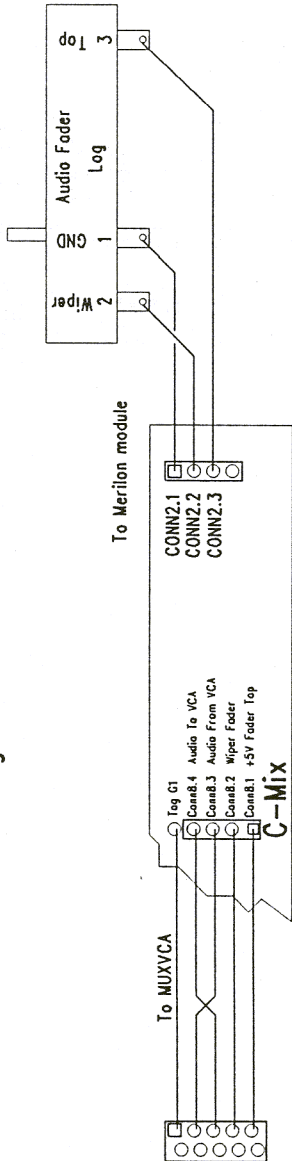
Watch Dog ON
2x jumper 1-2, 3-4
when log faders



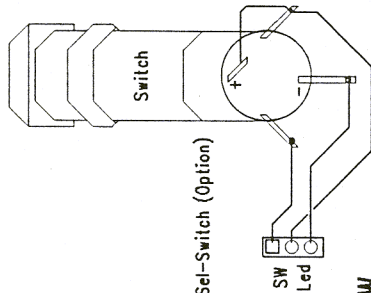
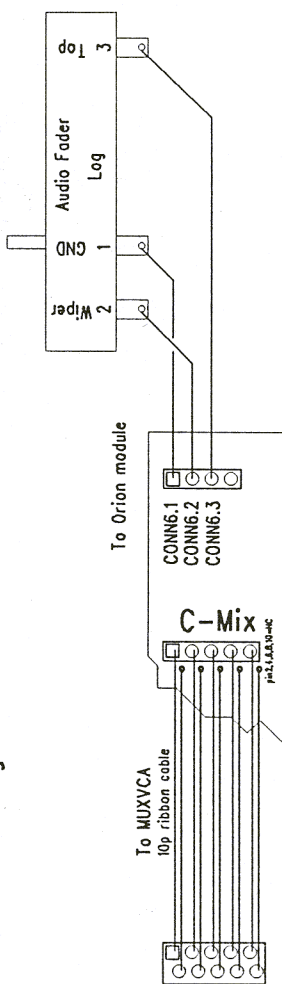
Wiring to other consoles



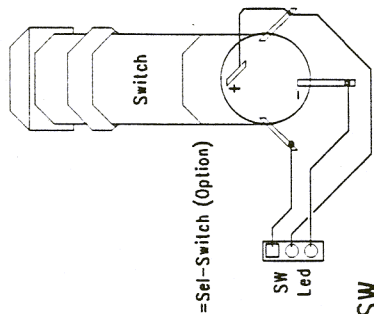
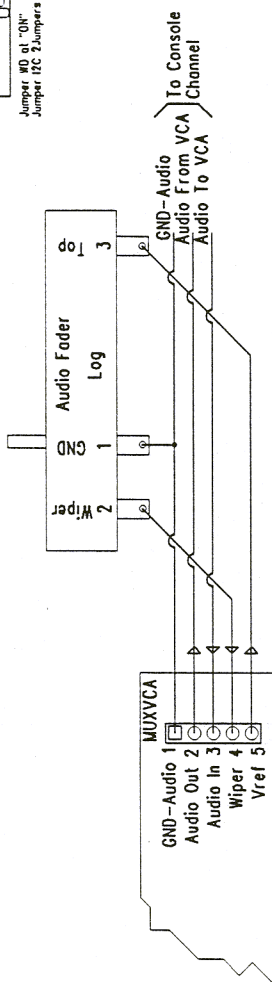
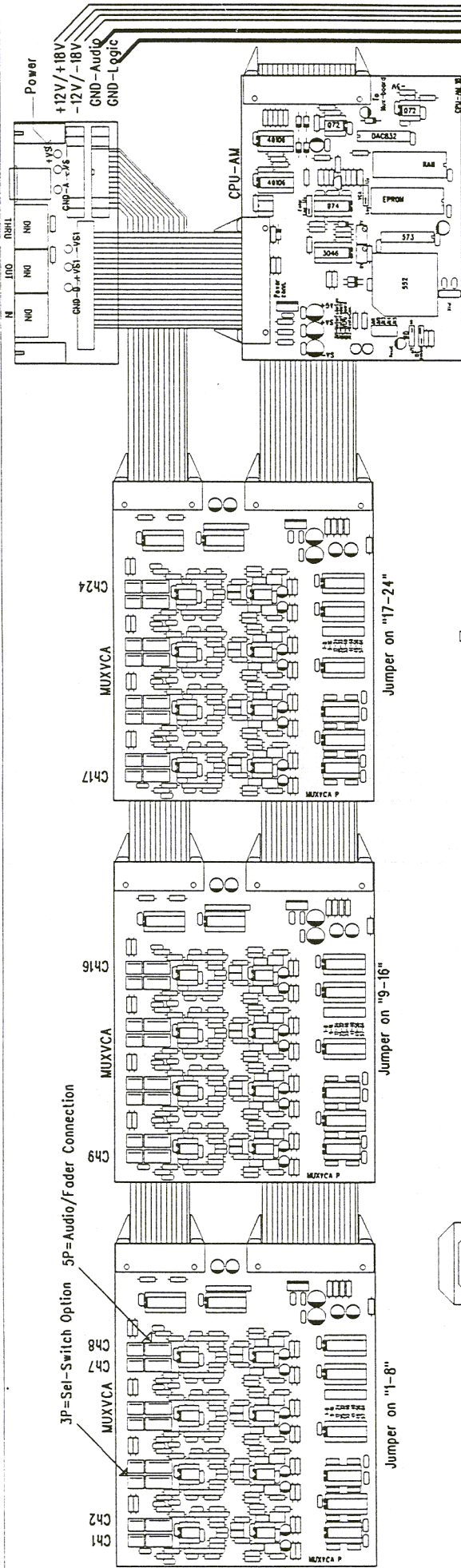
Wiring D&R PowerVCA LC to D&R Merilon with "C-Mix" conn.



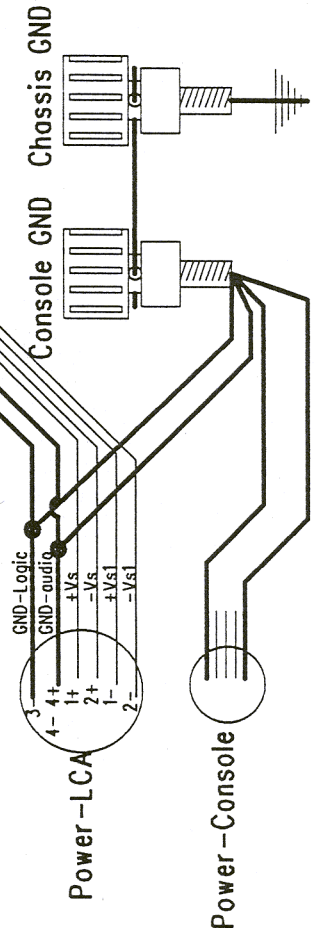
Wiring D&R PowerVCA LC to D&R consoles with "C-Mix" conn.



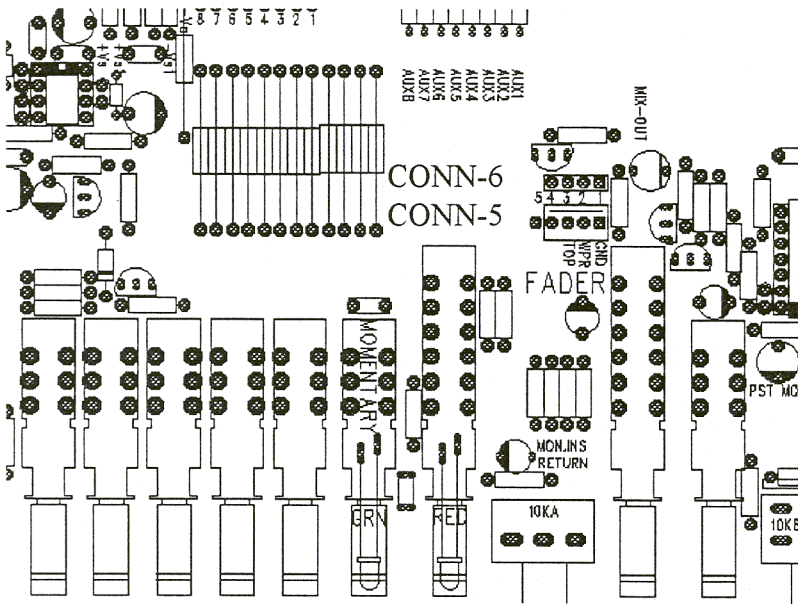
- 1 SEL SW
- 2 SEL SW, +LED (long lead)
- 3 -LED (short lead)



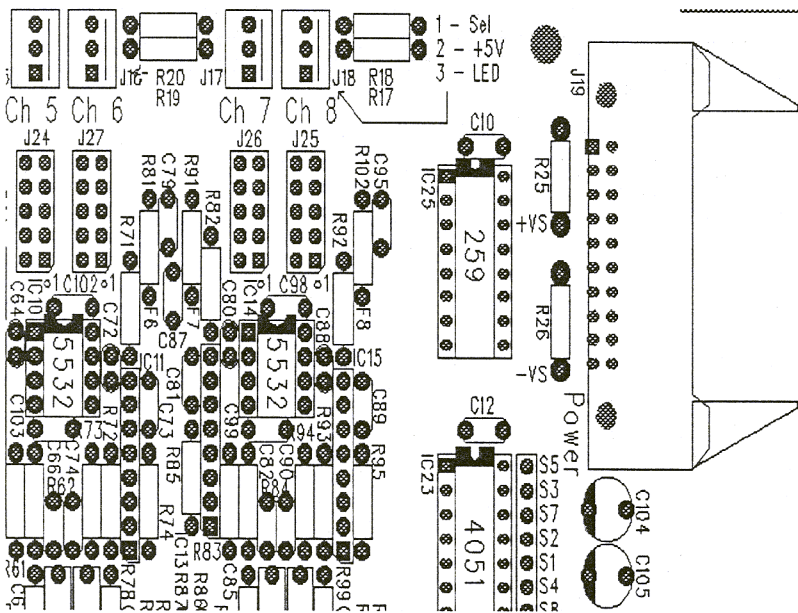
- 1 SEL SW
- 2 SEL SW, +LED (long lead)
- 3 -LED (short lead)



ORION 1N



MUXVCA_A



Bandkabel 10p 1 op 1. Op de MUXVCA_A staat pen 1 aangegeven met een stip. (Rechtsonder)

Op de ORION1N is pen 1 aan de rechterkant van conn.-5.

Sluit de fader aan op conn-6 als volgt:

- 1 GND
- 2 Wiper
- 3 Top

75 R
76 R
307 R
DR-8

17sw 16

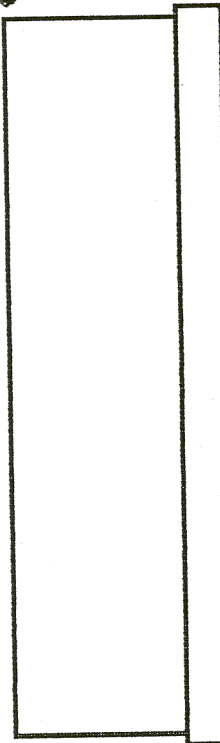
DR-7
DR-6
DR-5
DR-4

45 R
44 R
43 R
42 R
31C
30C
29 C

306 R
72R
74R
69R
70R

15
16 D
39 C
DR-9
38C
11 P

WIRE2
WIRE1



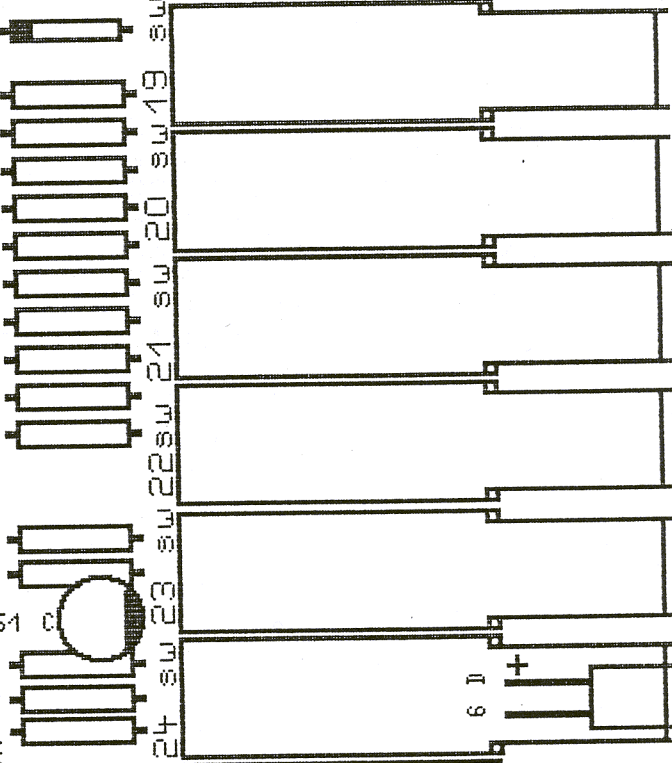
18sw
80 R
79 R
78 R
77 R
48 49 50 51 52 53 50 51 R 3 D

46 R
47 R
68 R
DR-2
DR-3
36C
DR-10

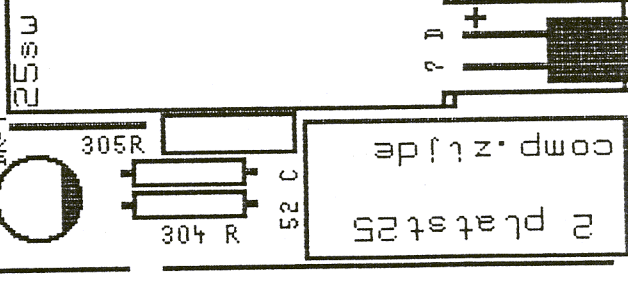
12 P

2 CONN 22P

81 R
60 R
51 C
40?R
59 R
58 R



C-mix
A B C D
108 R
106R
50 C
50 C



2 plates 25
comp. z. side

6 D
? D

4

93 R

81 R
82 R
83 R

58w 143w 133w

DR-22

DR-23

Dayner-8c

MON SWITCHABLE

POST-CH
PRE-CH

DR-16

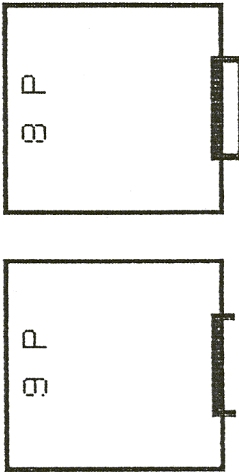
5-8 2 COHN
DR-38 6 COHN

DR-17

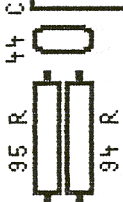
DR-18 5 COHN
DR-19 4 COHN

DR-20
DR-21

3+4



DR-24



IC3

11 SW

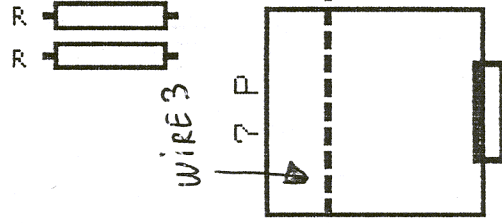
33 R
39 R

50 R

WIRE 3

7 P

12 SW



101 R

100 R

28 C
23 C

10 SW 22 C

37 R

49 C

38 R

26 C

27 C

21 C

6 P

302 C



300 C



38 DR

303 C



301 C



DR-25

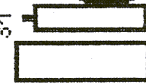
480 R

IC 2

DR-27



31 R



29 C

28 R

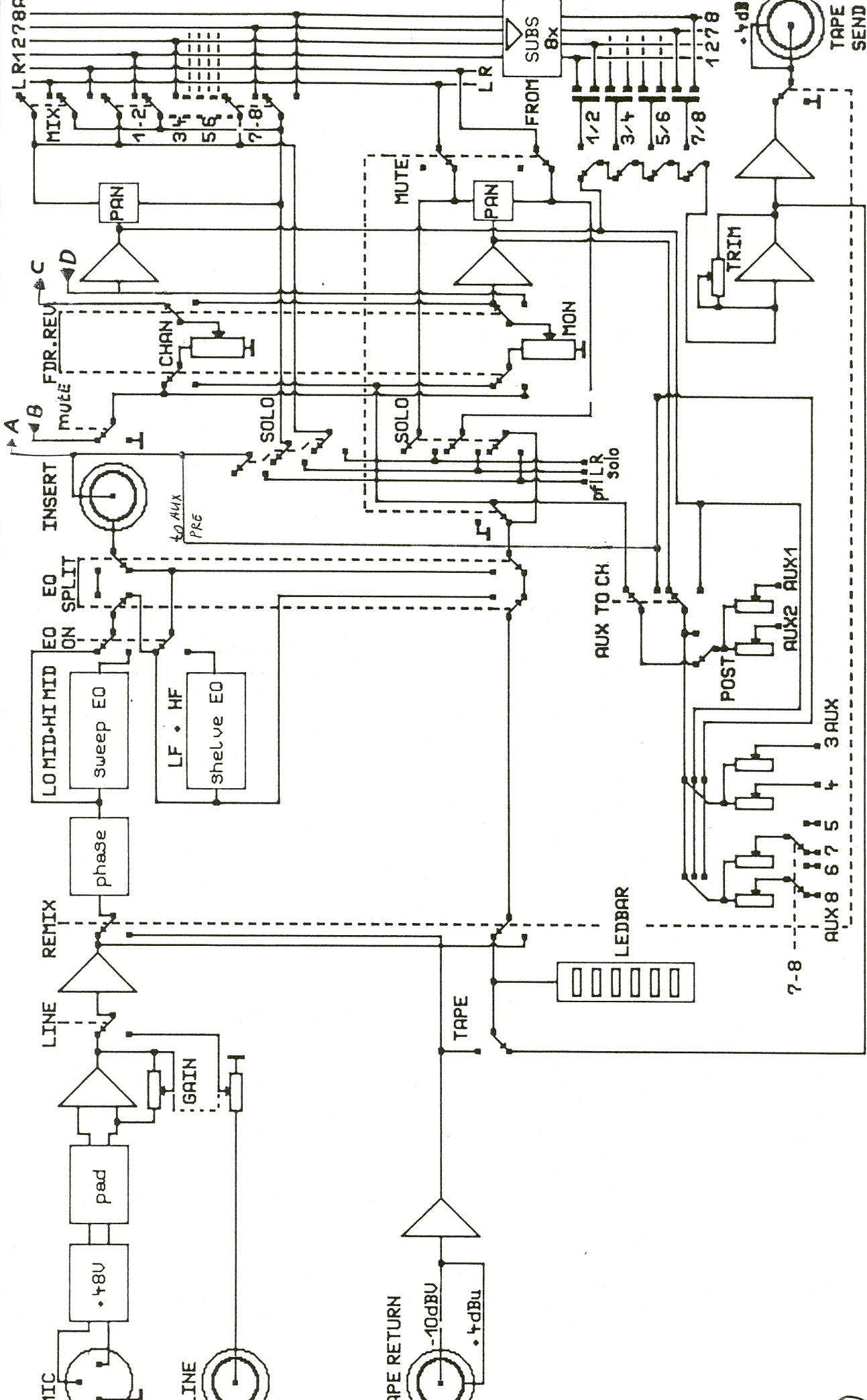
30R

DR-26

29 R

5 P

4 P

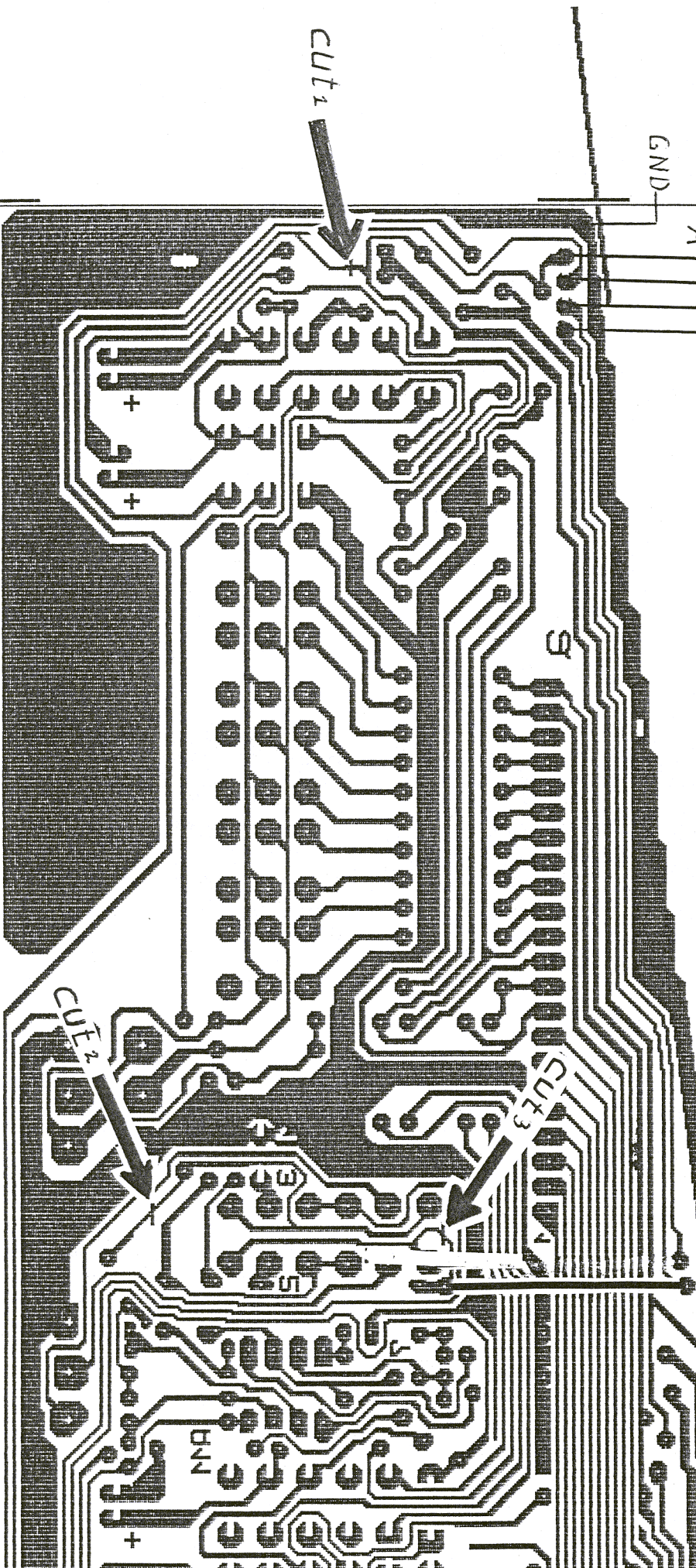


4/1997

Automation

dayner in-line

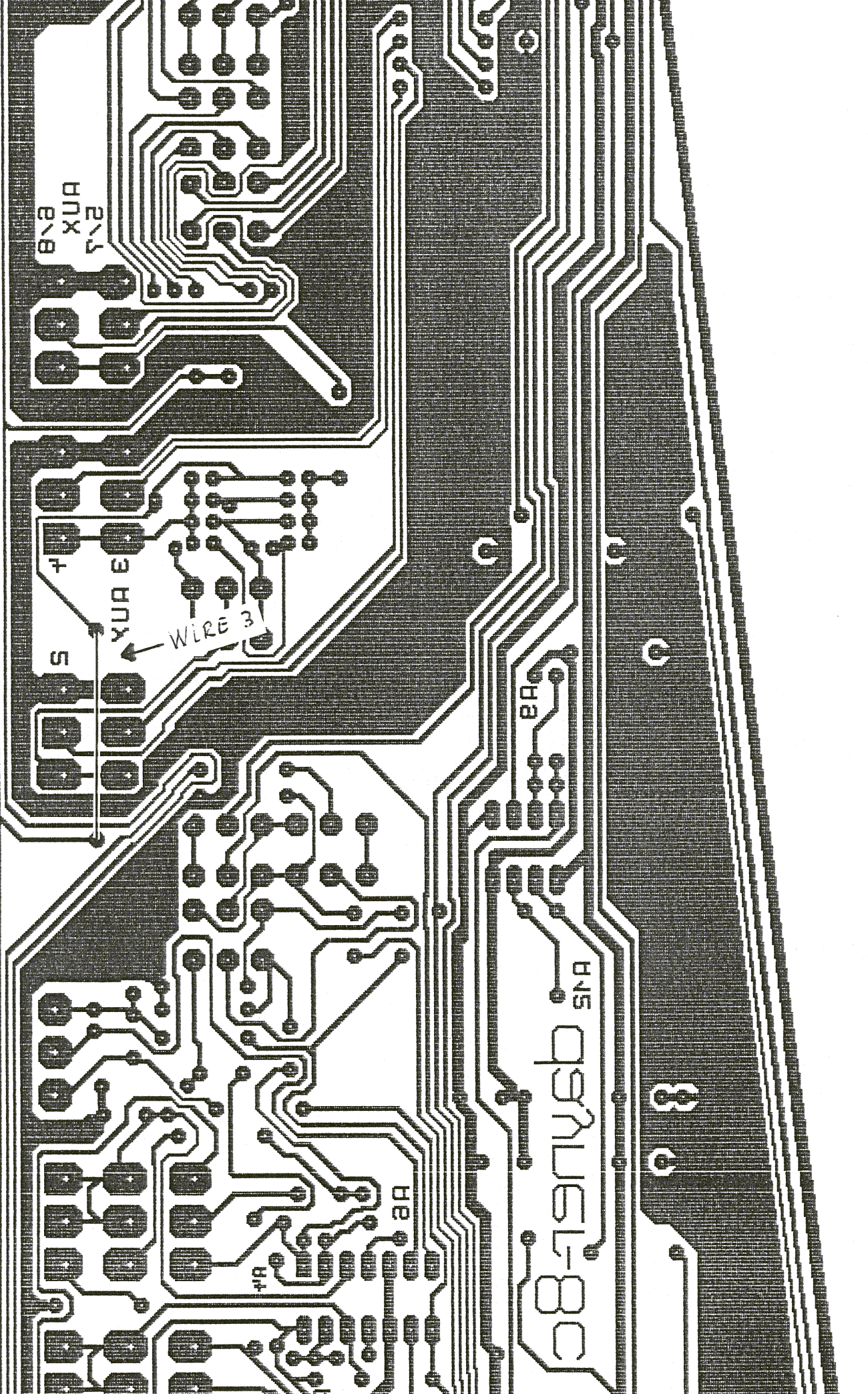
LOCK-DIAGRAM



NAME: ДРАЙВЕР-88	IN-LINE MODULE
DATE: 58-04-88	DATE: 58-04-88
DESIGNER: В.В.В.В.	DESIGNER: В.В.В.В.
DRIVER: В.В.В.В.	DRIVER: В.В.В.В.
SCALE: 1:1	SCALE: 1:1
CHECKED BY: В.В.	CHECKED BY: В.В.
DATE: 58-04-88	DATE: 58-04-88
MODIFICATIONS	BY

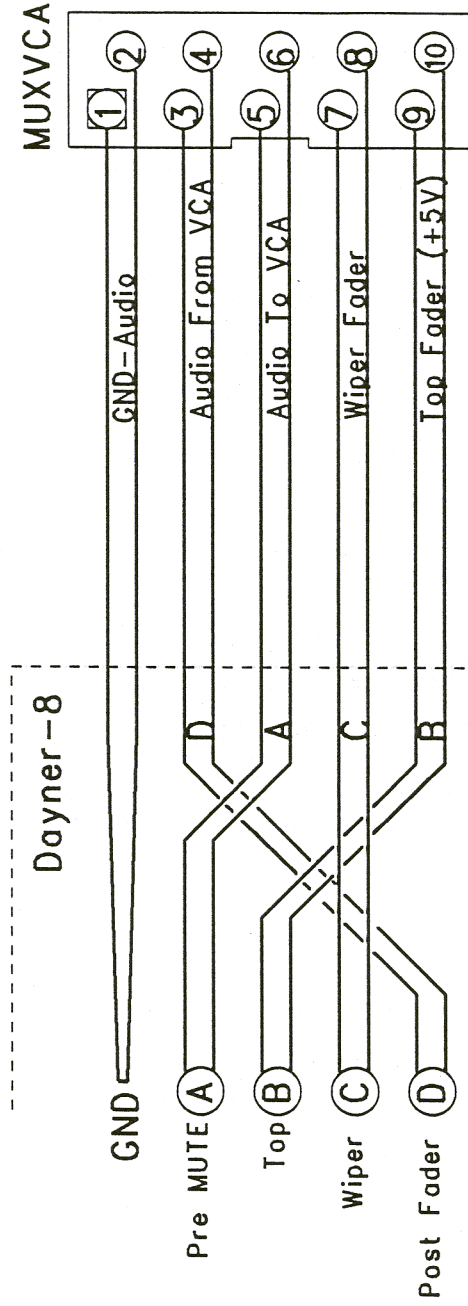
WIRE 1
WIRE 2

TAPE AUX TO CH 7/8 AUX5-6-7-8 AUX 3+4 1+2POST AUX 1+2 EO-SPLIT EO-ON LOW *LD-MID HIGH



Things to do on the Dayner In-Line

- 1: Make cut 1, 2 and 3.
- 2: Make wire 1, 2 and 3.
- 3: Make connection between "muxvca" board and Dayner In-Line mod.



Project:

Automation

Title:

Dayner-8

File:

dayner88.sch

Date:

4/1997

Sheet:

1 of 1

Rev:

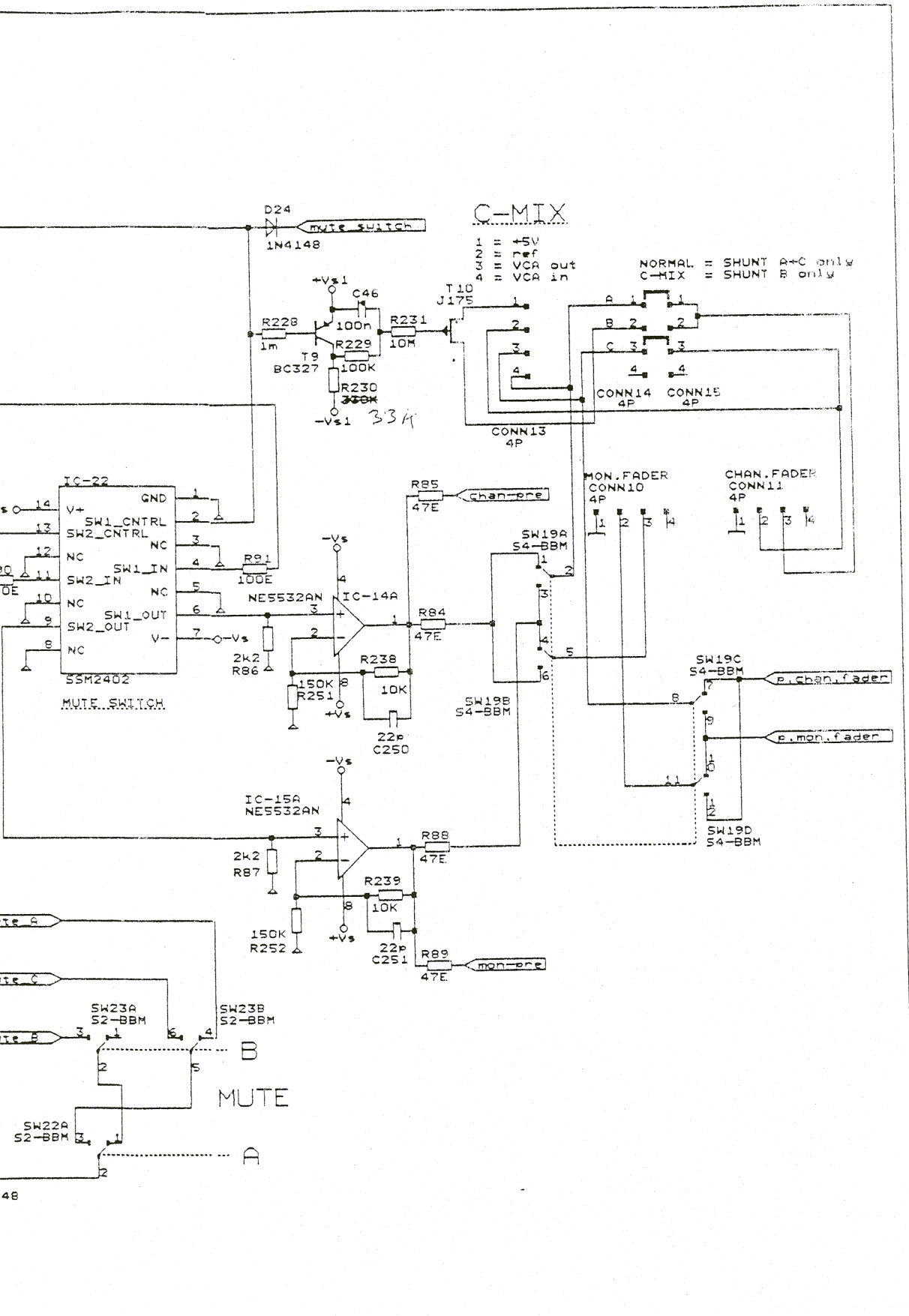
P

D&R
 Rijnkade 15b
 1382 GS Weesp
 The Netherlands
 phone: 0294-418014
 fax: 0294-416987

D&R Electronica B.V.

Design:

Jan Betten



THIS DRAWING REPLACES PREVIOUS ONES				Drawing E	AVALON	file: aval1-5
NO. BY	P			Size	Document Number	REV
DATE	06-03-1990			B	Avalon channel LOGIC	P
DESIGN	D. de Rijk			Date:	June 28, 1990	Sheet 5 of 6
DRAWN	P. HILCKE					