APPLICATION GUIDE



Soundcraft

VSA24 II

Contents

Important Notes

1. Introduction 1

Description of the VSA24 II 1

2. How to install the VSA24 II 3

Step 1. Checking for correct voltage 3

Step 2. Selecting the correct frame rate 4

Step 3. Selecting the correct jumpers 5

- Protocol - Parity - Baud Rate

Step 4. Selecting RS422 or RS232 Communications 6

Step 5. Selecting Reply Mode or Eavesdrop Mode 7

Step 6. Installing the unit 9

Step 7. Connections to the edit controller 10

Step 8. Connections to the audio mixer 12

Step 9. Final Test 13

3. VSA24 II Controls 15

Channel selection 17

Channel Indicator leds 17

Manual Mode 17

Local Mode 17

External Mode 18

Auto Mode 18

MONO/ STEREO selection 18

Fade Law selection 20

Fade Time selection 20

4 . Using the VSA24 II 21

Using Manual Crossfades 22

Using Triggered Crossfades 22

Ext/GPI 23

Using Automatic Crossfades 23

© Soundcraft 1990 Issue 3 Part No. ZZ2622

Contents (continued)

5 . Protocols 25

What is a protocol? 26

GVG100 26

AMX100 26

ESAM1 28

ESAM2 28

Other protocols 28

Appendix 31

Appendix 1 Customising the VSA24 II outputs 31

Appendix 2 Changing the Program EPROM 32

Appendix 3 Setting up the Soundcraft 200BVE Audio Mixer 33

Application Notes 35

Index of Application Notes 35

Warranty 46

1. Introduction

Description of the VSA24 II

The VSA24 II enables the S200BVE audio mixer (and other compatible mixers) to interface to video edit controllers using the most common serial interfaces. This means that the VSA24 II receives serial data used by the editing system, decodes the data and hence is able to generate the corresponding crossfades on the audio console. The audio crossfades, depending on which edit controller is used, can either follow all video transitions in audio-follow-video mode, or can be programmed to occur independently of the video transitions. The audio mixer is therefore controlled totally from the edit controller.

In addition to controlling the audio mixer from the edit controller, the VSA24 II has a range of controls which enables audio cross-fades with variable fade laws and times to be performed under manual control or via an external trigger from a General Purpose Interface (GPI).

The main features of the VSA24 II

AUTO MODE

Crossfades for up to eight video source machines can be controlled from the video edit controller. These crossfades follow the edit controller's start point and fade rate information. The fade laws are selected manually from the front panel of the VSA24 II.

MANUAL MODE

Crossfades for up to 24 channels can be controlled manually via a rotary control on the front panel of the VSA24 II.

LOCAL/EXT MODE

Crossfades for up to 24 channels can be triggered via a push button switch on the front panel (LOCAL MODE) or by a remote GPI trigger (EXTERNAL MODE). The fade law and fade time can be set up manually from the front panel.

MONO/STEREO

The user can select between 24 mono channels or 8 stereo pairs when in MANUAL, LOCAL or EXT modes, or 8 mono channels or 8 stereo pairs when in AUTO mode.

2. How to install the VSA24 II

How to install the VSA24 II

During installation the VSA24 II needs to be configured specifically to operate with different manufacturers' equipment. In order for the VSA24 II to work with your system it is important that the installation procedure is carried out correctly. Therefore the user should work through this chapter in the correct order before trying to operate the unit.

NB. Do not switch on the unit until the installation procedure has been fully carried out.

Step 1. Checking for correct voltage.

Remove the six fixing screws which hold the lid on the unit and remove the lid.

Check that the transformer has been wired for the correct mains voltage. Units being shipped to the U.S.A. are wired for 110V A.C. mains voltage and others are wired for 240V A.C. mains. To ensure that your unit is wired correctly refer to Fig. 2.1.

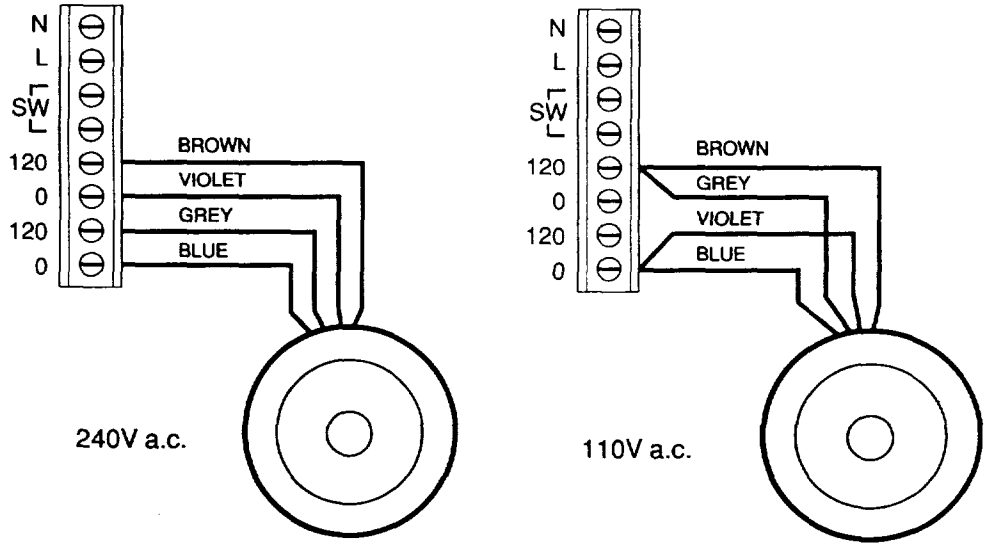


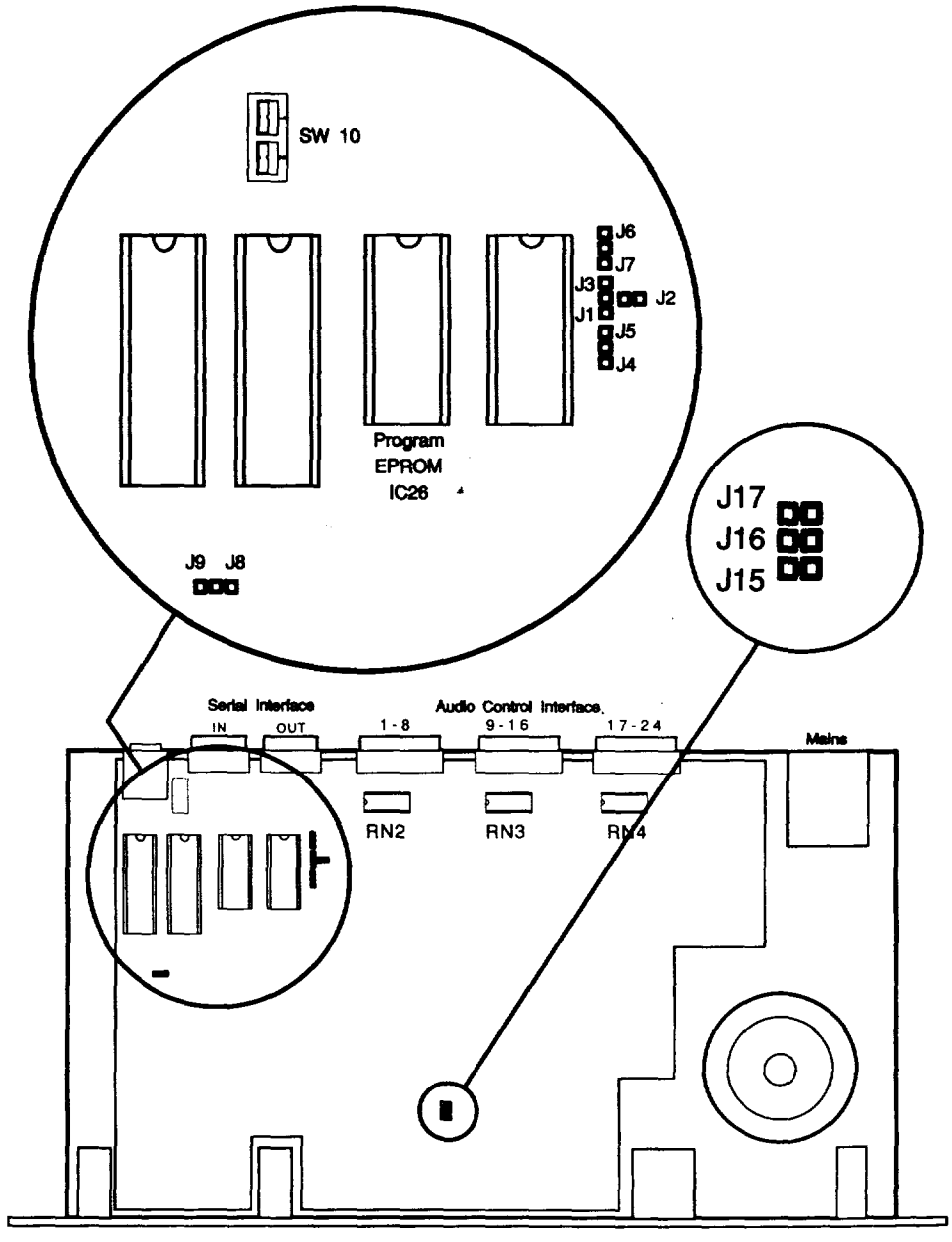
Figure 2.1 Transformer Wiring

2. How to install the VSA24 II

Step 2. Selecting the correct frame rate.

Software for the VSA24 II is available in two versions, one for 25 frames per second, and one for 30 frames per second. The software is stored in IC26 on the p.c.b.. Refer to Fig 2.2 to locate the position of this component. The label on this IC should indicate which frame rate the software is set up for (25 f.p.s. or 30 f.p.s.). If you have the wrong software please consult your Soundcraft dealer to obtain the correct software. Guidance on how to change the EPROM is given in Appendix 2. Running the VSA24 II with the incorrect frame rate will work but will result in errors in the fade times.

Figure 2.2 Circuit Board Configuration



VSA24 II Top view with cover removed

2 How to install the VSA24 II

Step 3. Selecting the correct jumpers.

The only jumpers which should be moved by the user are the ones described in this section. All other jumpers should be left in position from when the unit leaves the factory. Fig. 2.3 gives a summary of all the jumpers and their correct positions, and can be referred to as a check. However, the instuctions in this section give all the information which is needed to set up the VSA24 II.

Figure 2.3 Jumper Positions

Jumper	Function		Standard Position
1	Not user selectable		OUT
2	Not user selectable		OUT
3	Not user selectable		IN
4	Not user selectable		IN
5	Not user selectable		OUT
6	Not user selectable		OUT
7	Not user selectable		IN
8	Selects 38.4 KBaud		IN
9	Selects 9.6 KBaud		OUT
10	Not user selectable		OUT
11	Not user selectable		IN
15	Selects ODD or EVEN parity ODD = OUT EVEN = IN		IN
16	Protocol select (see below)		OUT
17	Protocol select (see below)		OUT
	AMX100	J16 = OUT	J17 = IN
	GVG100	J16 = IN	J17 = IN
	ESAM1	J16 = IN	J17 = OUT
	ESAM2	J16 = OUT	J17 = OUT

Protocol



The VSA24 II needs to be set up with software which is compatible with the protocol used by your edit controller. Chapter 5 of this manual gives more information about protocols. Software for the VSA24 II is currently available for the following protocols:

1. AMX100
2. GVG100
3. ESAM1
4. ESAM2

Chapter 5 will help you to decide which protocol your system is using. Also the application notes at the back of this manual will help you set up the VSA24 II for your system.

2. How to install the VSA24 II

Protocol (continued)

Having decided which protocol you require, now select the correct protocol by moving jumpers 16 and 17 as follows (see Figure 2.2):

Protocol	J16	J17
AMX100	OUT	IN
GVG100	IN	IN
ESAM1	IN	OUT
ESAM2	OUT	OUT

Parity

You will need to select the parity for your system. Your edit controller manual should tell you whether the parity for your system is ODD or EVEN. If your edit controller is included in the application notes in this manual then this should tell you the correct parity. Some edit controllers have parity user-selectable from a menu in the software or by switches in hardware. NO PARITY is not supported by the VSA24 II, since parity checking is considered a necessity for reliable communication. Having decided what parity you require select it as follows (see Fig. 2.2):

Parity	J15
ODD	OUT
EVEN	IN

Baud Rate

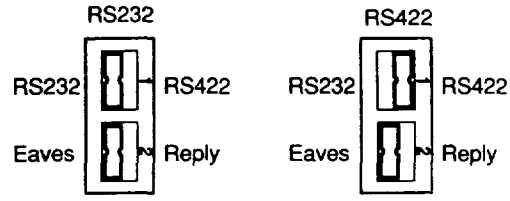
The baud rate of the serial link to the edit controller is selectable between 9.6 Kbaud and 38.4 Kbaud. Refer to your edit controller manual and the application notes to decide which you require. Select the baud rate as follows (see Figure 2.2):

Baud rate	J8	J9
9.6 Kbaud	OUT	IN
38.4 Kbaud	IN	OUT

Step 4. Selecting RS422 or RS232 Communications

The VSA24 II can operate using RS422 or RS232. Either option can be selected by operating SW10 on the pcb. Refer to Fig. 2.2 to locate this switch. Fig. 2.4 shows the correct positions for RS232 and RS422. Most edit controllers use RS422.

Figure 2.4 Switch 10 Positions



NB The bottom switch does not affect the RS422/232 selection

Step 5. Selecting Reply Mode or Eavesdrop Mode

The VSA24 II can communicate to a video edit controller in two modes, Reply or Eavesdrop.

Reply Mode

Fig. 2.5 shows how the VSA24 II would fit into a system in Reply mode. The VSA24 II is connected to a port on the edit controller via the serial in connector on the rear of the unit. The video switcher is connected to the edit controller via a separate port on the edit controller. The edit controller sends separate commands to the video switcher and the VSA24 II and expects separate replies back from both units. The VSA24 II responds to the edit controller's commands with the expected acknowledgements according to the protocol selected.

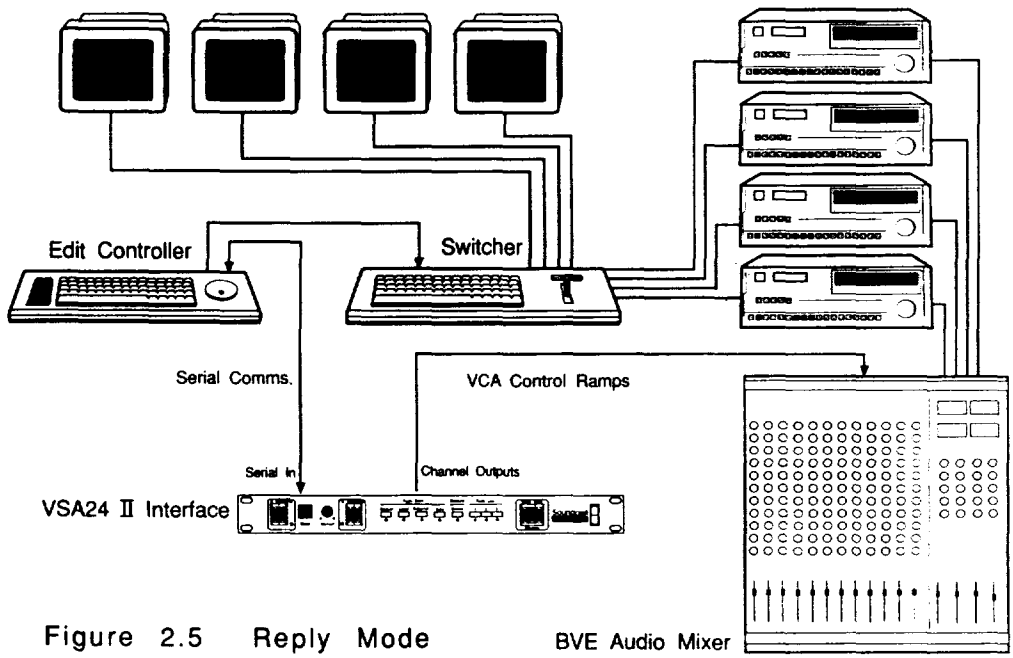


Figure 2.5 Reply Mode

2. How to Install the VSA24 II

Eavesdrop Mode

Fig. 2.6 shows the VSA24 II connected into a system in Eavesdrop mode. The VSA24 II is connected in between the video switcher and the edit controller so that the edit controller only sends one set of commands to the video switcher. The VSA24 II eavesdrops on these commands. The switcher sends replies back to the edit controller via the VSA24 II. The output from the VSA24 II serial driver is disconnected by SW10 on the pcb so that only the replies from the video switcher are received by the edit controller. Therefore, to the edit controller it looks as if there is only a video switcher connected to the port. This mode only allows straight audio-follow-video crossfades.

Whether you use Reply or Eavesdrop mode will depend on your edit controller. If your edit controller only has one serial port which is being used for the video switcher then you will need to use Eavesdrop mode and use the same protocol for the VSA24 II as that being used to drive the video switcher. If your edit controller has extra ports which can be used for the VSA24 II then you can use Reply mode. Ensure that the port driving the VSA24 II is using the same protocol as the VSA24 II. Some edit controllers have software for several protocols which are selectable from a menu.

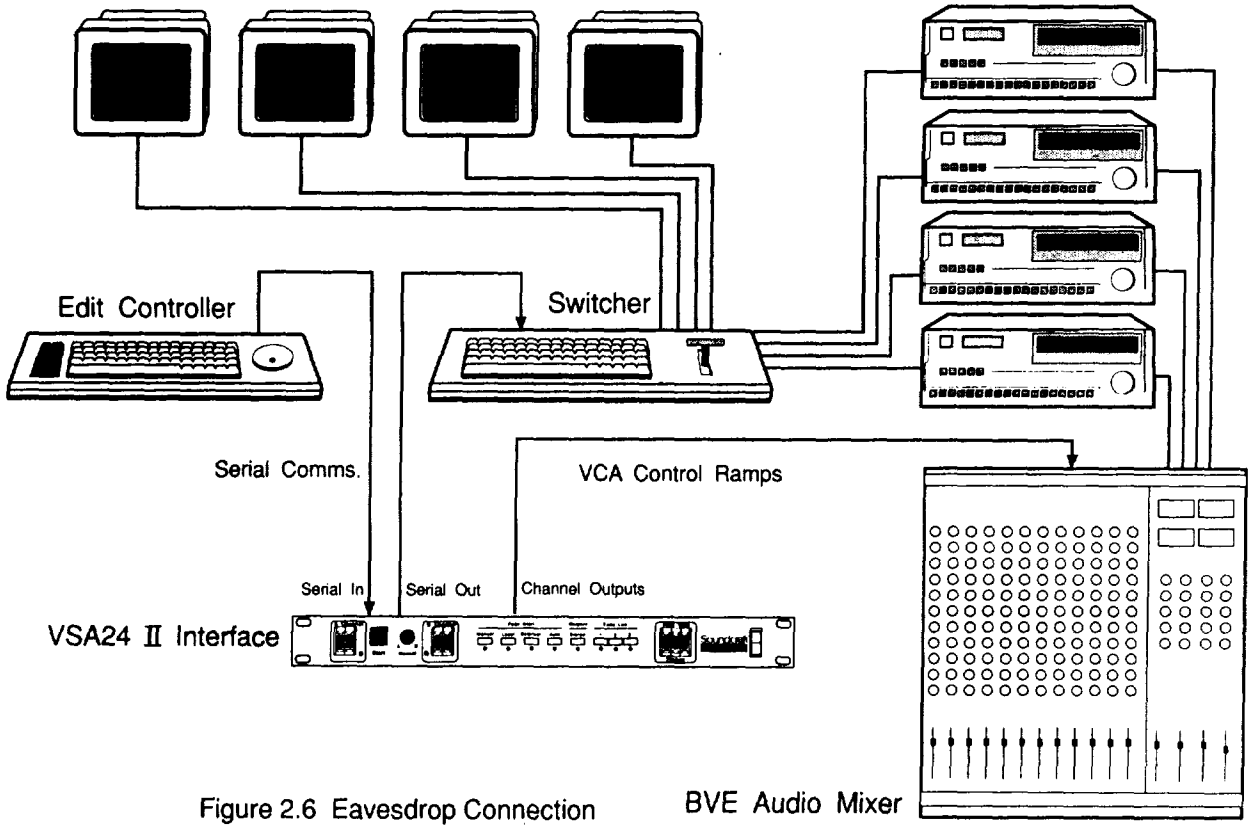


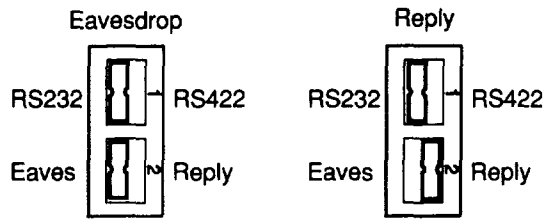
Figure 2.6 Eavesdrop Connection

2. How to Install the VSA24 II

Selecting Reply Mode or Eavesdrop Mode (continued)

Having decided on either Reply mode or Eavesdrop mode, SW10 on the pcb must be used to select the mode. Fig. 2.2 shows where SW10 is located on the pcb and Fig. 2.7 shows the correct positions for SW10.

Figure 2.7 Switch 10 Positions



NB The top switch does not affect the Reply/Eavesdrop selection

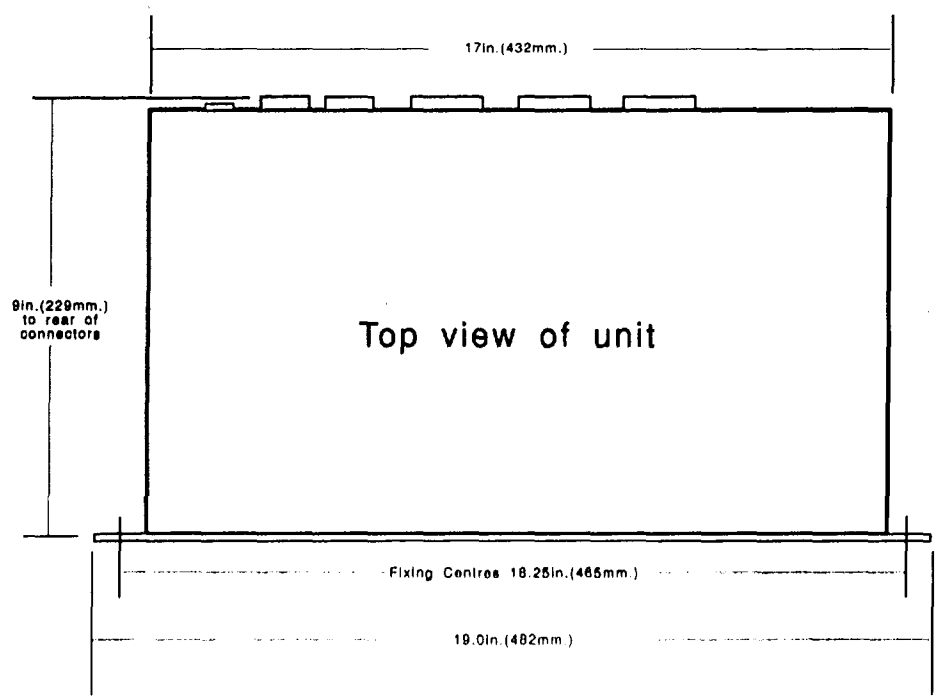
Step 6. Installing the unit.

The VSA24 II should now be set up correctly internally to run with your system. Replace the lid on the unit and screw down the six fixing screws.

The VSA24 II is a standard 1U 19 inch rack-mounted unit requiring 1 3/4 inches (44.45mm) of vertical clearance. The mounting points and dimensions are shown in Fig 2.8. You should allow 2 inches at the rear of the unit for connectors.

The unit is not fan-cooled and should not be mounted directly above heat generating units such as power amplifiers.

Figure 2.8 Dimensions



Step 7. Connections to the edit controller.

Reply mode:

The port on the edit controller which has been allocated to the VSA24 II should be connected to the connector on the VSA24 II marked 'Serial In'. Fig 2.9 shows the back panel of the VSA24 II. Refer back to Fig. 2.5 to see how the system should be connected up.

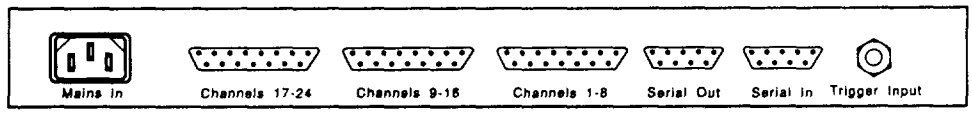
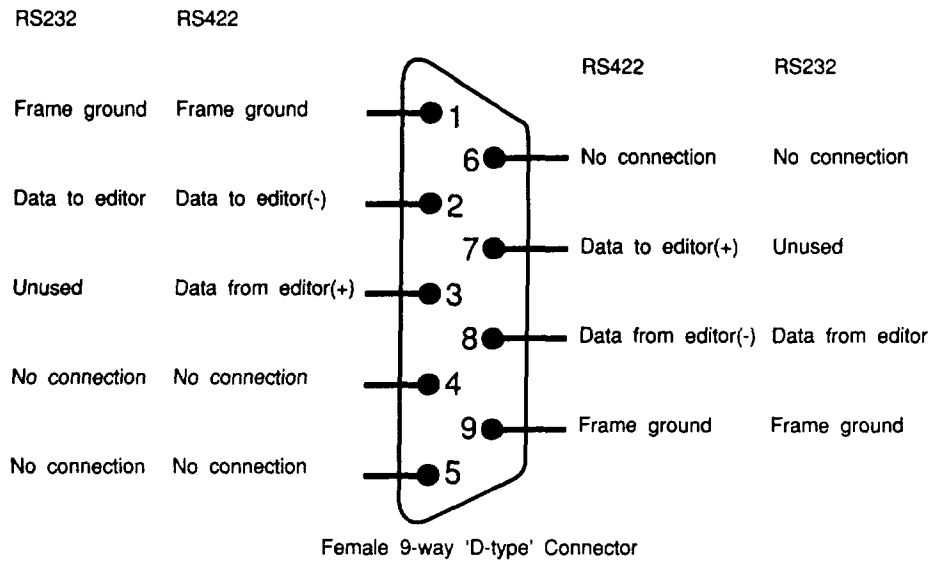


Figure 2.9 Rear Panel

You will need a 9-way cable to connect between the edit controller and the VSA24 II. At one end the cable will need a 9-way male D-type connector to plug into the VSA24 II. At the other end the cable will need a suitable connector to plug into the edit controller. Normally this will be a male 9-way D-type and the cable will be 'pin to pin' (ie. connected 1 - 1,2 - 2,3 - 3 etc).

Fig. 2.10 shows the pin-out of the 'Serial In' connector on the VSA24 II. In reply mode the connector marked 'Serial Out' on the VSA24 II is not connected.

Figure 2.10 Serial In Connector on VSA24 II



Female 9-way 'D-type' Connector

2. How to install the VSA24 II

Eavesdrop mode:

The port on the edit controller which is normally connected to the video switcher is connected to the connector marked 'Serial In' on the VSA24 II. Fig 2.9 shows the back panel of the VSA24 II. Refer back to Fig. 2.6 to see how the system should be connected up. You will need a 9-way cable to connect between the edit controller and the VSA24 II. At one end the cable will need a 9-way male D-type connector to plug into the VSA24 II. At the other end the cable will need a suitable connector to plug into the edit controller. Normally this will be a male 9-way D-type and the cable will be 'pin to pin' (i.e. connected 1 - 1,2 - 2,3 - 3 etc). Fig. 2.10 shows the pin-out of the 'Serial In' connector on the VSA24 II.

The connector marked 'Serial Out' on the VSA24 II is connected to the video switcher where the edit controller had previously been connected. You will need a 9-way cable to connect between the VSA24 II and the switcher. At one end the cable will need a 9-way female D-type connector to plug into the VSA24 II. At the other end the cable will need a suitable connector to plug into the video switcher. This will normally be a 9-way male D-type connector and the cable will be wired 'pin to pin' (i.e. connected pin 1 - 1,2 - 2,3 - 3 etc).

Fig. 2.11 shows the pin-out of the Serial Out connector on the VSA24 II.

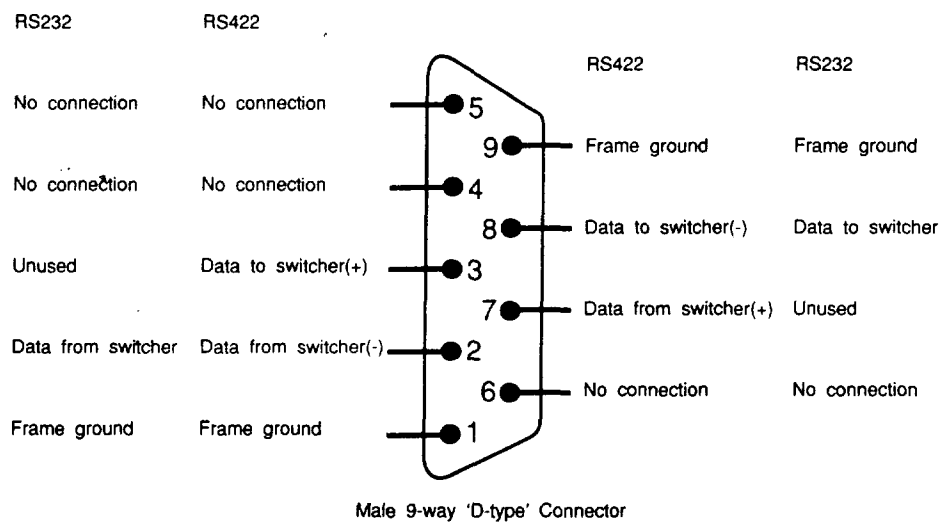


Figure 2.11 Serial Out Connector on the VSA24 II

2. How to Install the VSA24 II

Step 8. Connections to the audio mixer.

There are 3 connectors on the VSA24 II which can be connected to the S200BVE or compatible audio mixer (see Fig.2.9). CN8 controls channels 1-8, CN9 controls channels 9-16, CN10 controls channels 17-24. Other control signals are also sent on connector CN8 which is the master control connector and must always be connected. The leads should be 'pin to pin' (i.e. 1 - 1, 2 - 2 etc) 15-way and have a male 15-way D-type connector at one end to connect to the VSA24 II and a female 15-way D-type connector at the other end to connect to the S200BVE.

Fig.2.12 shows the pinout of each of the connectors.

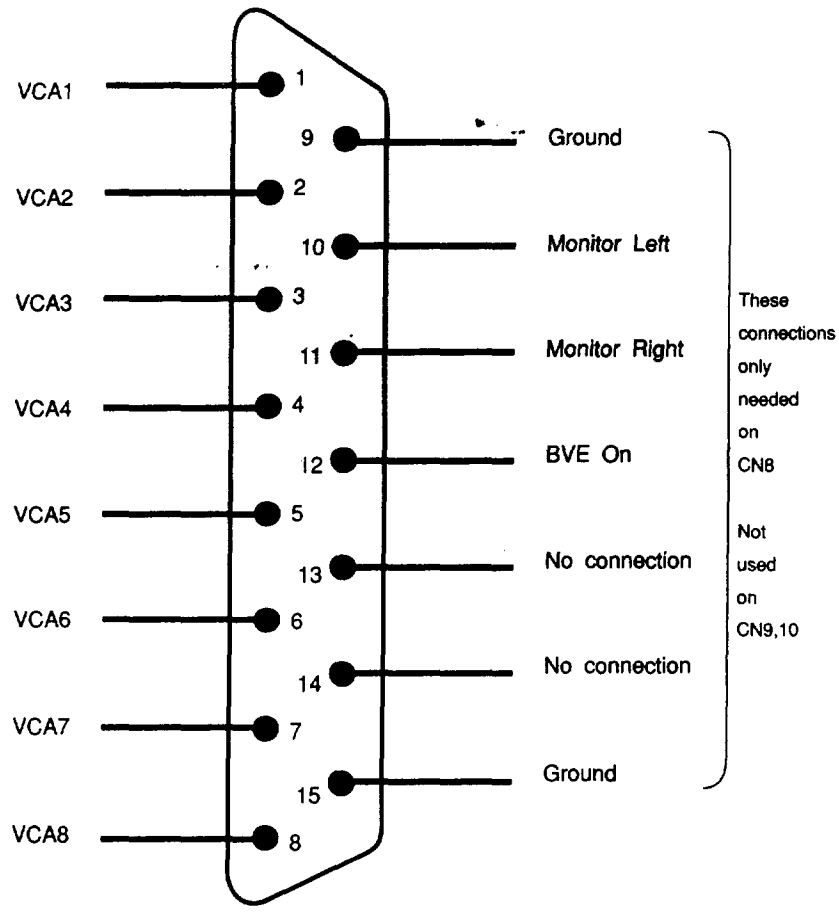


Figure 2.12 Connections to the Audio Mixer

Step 9. Final Test.

Finally connect your mains lead to the unit and switch on. Refer to Appendix 3 if you need guidance on setting up the 200BVE Audio Mixer with the VSA24 II.

Testing the VSA24 II should be done in two stages. Stage 1 establishes that the VSA24 II processor and analogue outputs to the audio mixer are operating. Stage 2 tests that the messages from the edit controller are being decoded and used to trigger the appropriate audio fades.

Stage 1 - A Manual Crossfade

- Patch some contrasting audio signals to Channel 1 and Channel 2 of the 200BVE mixer
- Select **Mono** mode.
- Select **Manual**.
- Set **A Channel** thumbwheel to 1.
- Set **B Channel** thumbwheel to 2.
- Turn the rotary control, **Manual A B**, first one way, then the other.

The audio crossfade should be clearly audible at the mixer output.

- Select **Local**
- Select a **Fade Time** of 50 frames on the thumbwheel.
- Check that one of the three **Fade Law** buttons is selected.
- Press **Start**.

A 2 second crossfade should be clearly audible at the mixer output. This test proves that the VSA24 II is operational.

Stage 2 - Auto Crossfade

This test establishes that the communications protocol used by the edit controller and switcher is compatible with the VSA24 II interface. A failure of this test usually indicates that the protocol selection has been set up incorrectly, or that the edit controller does not conform to the selected standard, or that the serial link (baud rate, parity) has not been set up correctly.

- Press the **Auto** switch on the VSA24 II.
- Set up a transition on the edit controller from channel 1 to channel 2.
- Start a transition of about 50 frames duration.

The audio channels should follow the video. If this test fails:

Switch off the VSA24 II and disconnect the mains supply before removing the lid and repeating the installation proceedure.

---

1 Check that the installation procedure has been followed correctly.

2 Refer to the edit controller documentation to establish whether the protocol selected conforms to one of the four standards supported by the VSA24 II.

3. VSA24 Ⅱ Controls

VSA24 Ⅱ Controls

VSA24 II Controls

Fig.3.1 shows a diagram of the front panel of the VSA24 II.

Channel selection

The channel selection switches are thumb-wheel switches which are used to set up the two channels which are to be crossfaded. In **Manual**, **Local** and **External** mode these channel switches always define which channels are to be used. In **Auto Mode** the edit controller sends the channel numbers to the VSA24 II and so the channel selection switches are redundant. For information on how the channel numbers are interpreted see the section on Mono/Stereo selection.

Channel Indicator leds

The channel indicator leds beside the channel selection switches indicate the state of the voltage ramps which control the VCA's in the audio mixer. When a crossfade occurs the user can see the voltages change by watching the indicator leds. These leds will always show a timed crossfade occurring, whether the unit is in **Manual**, **Local, External** or **Auto** modes. If the led is ON it means the channel is faded up, if the led is OFF then the channel is faded down.

Manual Mode

Manual mode allows the user to crossfade between the channels selected with the channel selection switches on the front of the VSA24 II. The crossfade is implemented manually using the rotary control annotated **A B Manual.** The crossfade can be observed by watching the channel indicator leds changing.

Local Mode

Local mode allows a crossfade to be initiated by the user pressing the start button in between the channel selection switches. The channels which are crossfaded are determined by the channel selection switches. The length of the crossfade is set up using the **Fade Time** switches. The fade law which is followed is set up with the **Fade Law** selection buttons. The crossfade can be observed by watching the channel indicator leds changing.

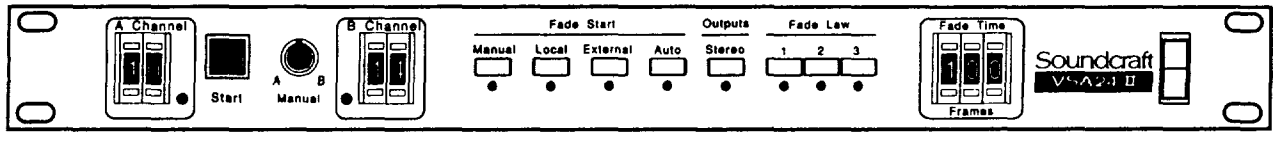


Figure 3.1 Front Panel Controls

3. VSA24 II Controls

External Mode

External mode operates the same way as **Local** mode except that the rear panel trigger input operates the trigger instead of the front panel **Start** button. The crossfade is triggered when the voltage on the trigger input is logical LOW (i.e. 0 volts).

Auto Mode

Auto Mode puts the VSA24 II under the control of the edit controller. The control signals issued by the edit controller are decoded in accordance with the selected protocol. Normally the VSA24 II receives a foreground channel number, a background channel number and a fade rate via the serial link from the edit controller. It then receives a command to start the transition and so the appropriate channels on the audio mixer are crossfaded.

The only panel controls which have any effect in **Auto** mode are the **Stereo** and **Fade Law** pushbuttons. The **Stereo** pushbutton determines how the channel numbers sent by the edit controller correspond to the channels on the audio mixer. Refer to the explanation of the **Mono / Stereo** button for more detail. The **Fade Law** button determines which fade law is followed when a crossfade occurs. The crossfade can be observed by watching the channel indicator leds changing.

MONO/ STEREO selection

The stereo selection switch changes the way in which channel numbers are interpreted i.e. whether they are treated as mono or stereo channels.

In **Manual**, **Local** and **External** modes the channel numbers are read from the channel selection switches and are decoded according to the diagrams given in Fig.3.2(a) & (b).

In **Mono** mode the channel numbers are decoded on a one-to-one basis i.e. 1 - 1, 2 - 2, 3 - 3, through to 15 - 15, 16 - 16. This is shown in Fig.3.2(a).

In **Stereo** mode the channel number is treated as a stereo machine number i.e. 1 - (1,2), 2 - (3,4), 3 - (5,6), through to 8 - (15,16). Channels 9 to 24 have no meaning. This is shown in Fig.3.2(b).

In **Auto** mode the channel number is sent to the VSA24 II via the serial link and is interpreted according to the protocol being used. The hardware is configured as shown in Fig.3.3.

In **Mono** mode the channel numbers are decoded on a one-to-one basis i.e. 1 - 1, 2 - 2, 3 - 3, etc. This is shown in Fig.3.3(a).

In **Stereo** mode the channel is treated as a stereo machine number i.e. 1 - (1,2), 2 - (3,4), 3 - (5,6). Channels 9 to 24 have no meaning. As can be seen from Fig.3.3(b), output channels 17 to 24 are connected but not as stereo pairs and would not normally be used in this mode.

Permanent repatching of the output channels is possible if required and is described in Appendix 1 of this manual.

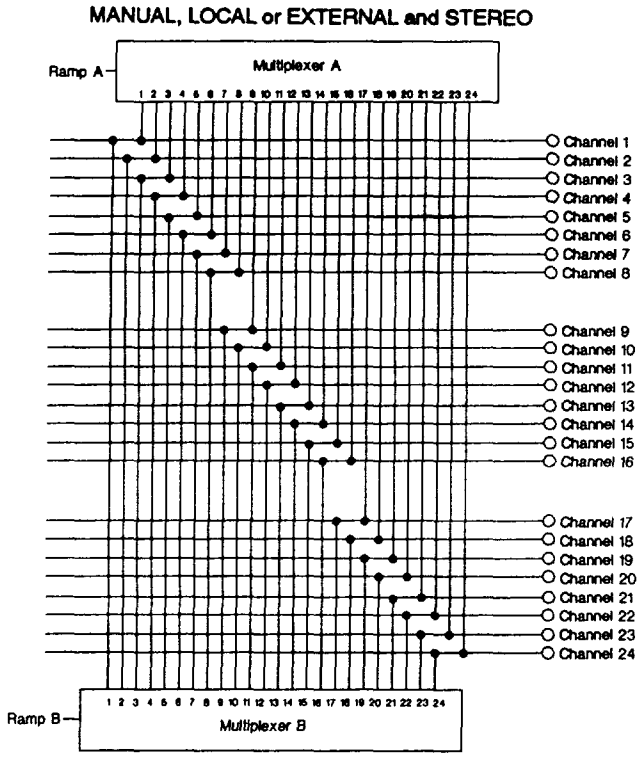


Figure 3.2(a) Manual and Mono Mode

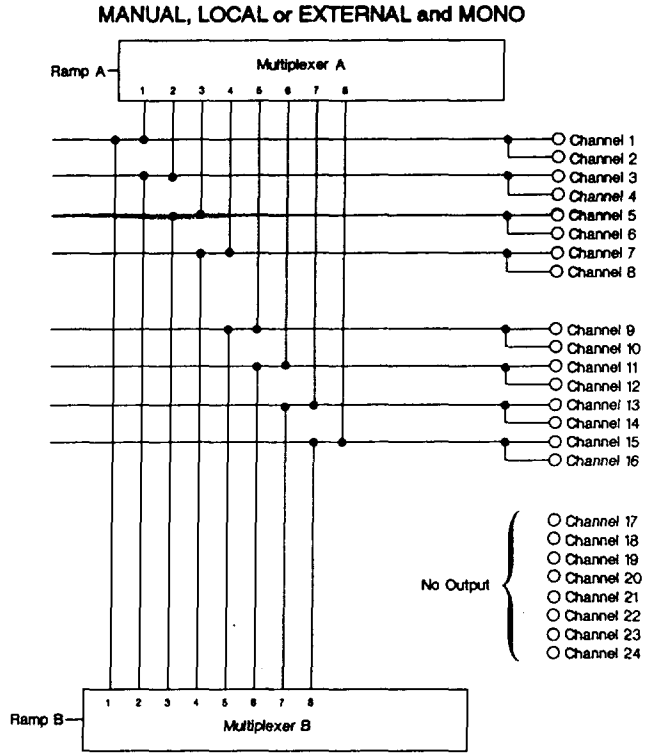


Figure 3.2(b) Manual and Stereo Mode

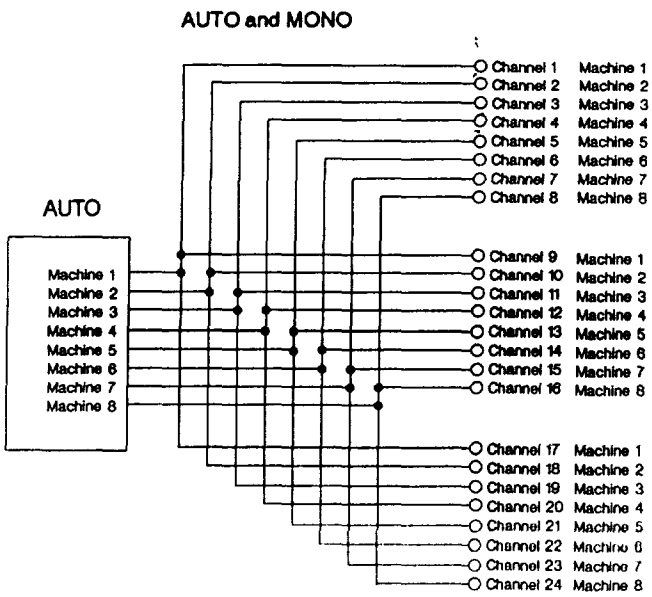


Figure 3.3(a) Auto and Mono Mode

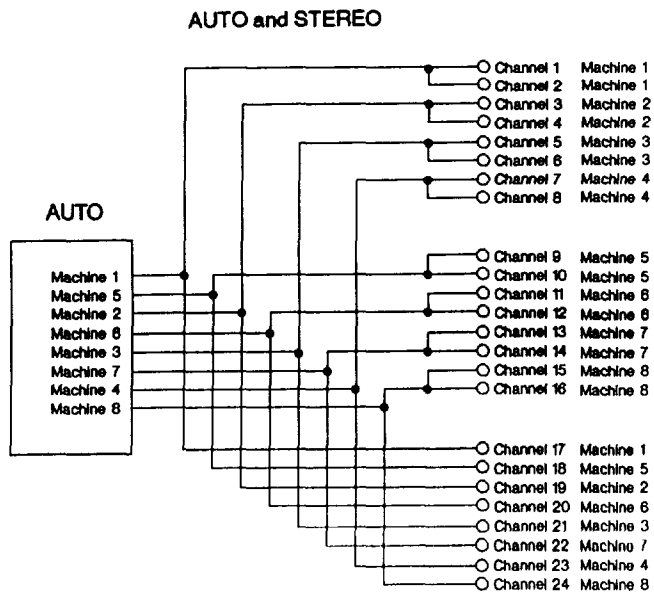


Figure 3.3(b) Auto and Stereo Mode

Fade Law selection

One of three crossfade laws can be selected using the three numbered pushbuttons.

Figures 3.4(a),(b),(c) illustrate the three laws.

Fade Law 1

Linear Crossfade

The channel which is audible at the start quickly fades, followed by an almost silent period before the second channel fades in. At the centre point the attenuation is about 50dB. This law can be usefully used with faders which provide their own logarithmic correction.

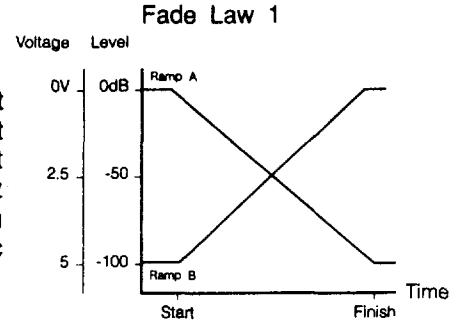


Figure 3.4(a)

Fade Law 2

Logarithmic Crossfade

This is the most commonly used law. The first channel is still audible as the second fades in. At the centre point the attenuation is approximately 6dB.

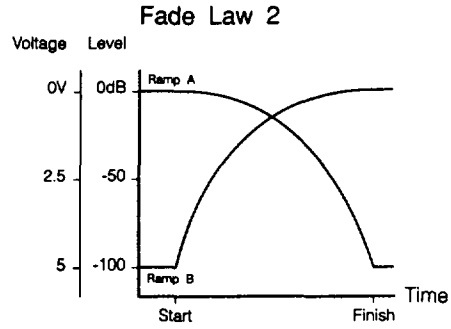


Figure 3.4(b)

Fade Law 3

Stepped Linear

This results in an audibly smooth transition, the steps being at such a low level that they are inaudible. At the centre point the attenuation is approximately 6dB.

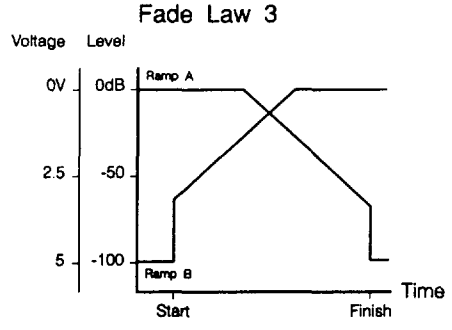


Figure 3.4(c)

Fade Time selection

The fade time selection switch enables the user to define the length of a crossfade in **Local** and **External** modes. The fade time is variable between 0 and 255 frames. The frame rate is linked to the VSA24 II's internal crystal clock and the actual frame rate is determined by the software installed. There are two options 25 frames per second or 30 frames per second. If 0 frames is selected then a fade time of 1 frame is assumed. Fade times greater than 255 default to 255 frames.

4 - Using the VSA24 II

Using the VSA24 II

Using Manual Crossfades

To manually crossfade two mono audio channels on the BVE desk:

- Check that the **Stereo** button is in the **OUT** position.
- Press the **Manual** trigger select button.
- Select a Channel number between 1 and 24 for the start of the fade using the **A Channel** thumbwheel switches.
- Select a different Channel number for the finish of the fade using the **B Channel** thumbwheel switches.
- Turn the rotary **Fade** control fully anti-clockwise to hear the A Channel.
- Turn the **Fade** control clockwise to crossfade to the B Channel.

To manually crossfade a pair of stereo signals:

- Follow the procedure above, but with the **Stereo** button pressed.
- Ensure that each stereo signal is patched to adjacent pairs of inputs on the audio mixer, i.e. channels 1 and 2, 3 and 4, 5 and 6 etc.
- Check that each channel number corresponds to the required pair from the mixer. (refer to figure 3.2b if necessary)

Using Triggered Crossfades

To trigger a mono crossfade from the front panel of the VSA24 II:

- Check that the **Stereo** button is in the **OUT** position.
- Press the **Local** trigger select button.
- Select a Channel number between 1 and 24 for the start of the fade using the **A Channel** thumbwheel switches.
- Select a different Channel number between 1 and 24 for the finish of the fade using the **B Channel** thumbwheel switches.
- Select a fade duration in frames on the **Fade Time** thumbwheel switches.
- *Trigger the crossfade by pressing the* **Start** button.

Using Triggered Crossfades (continued)

To trigger a stereo crossfade from the front panel of the VSA24 II:

- Follow the procedure above, but with the **Stereo** button pressed.
- Ensure that each stereo signal is patched to adjacent inputs on the audio mixer.
- Check that each channel number corresponds to the required pair on the audio mixer. (refer to Figure 3.2b if necessary)

EXT/GPI

To trigger a crossfade using the GPI Trigger:

- If your edit controller has a GPI(General Purpose Interface) output, this can be connected to the GPI input on the rear panel of the VSA24 II.
- Check that the **External** button on the VSA24 II is pressed.
- Crossfades can now be initiated from the edit controller, which should operate the trigger when a transition is performed.

Using Automatic Crossfades

In **Auto** mode the VSA24 II responds to commands issued from the Video Editing System and only the **Mono/Stereo** and **Fader Law** buttons have any effect.



Channel selection, Fade Duration and Stereo grouping are selectable remotely by the edit controller, and since practice varies between edit controller manufacturers it is important that the useage of particular commands on your system is understood.

Refer to the edit controller documentation for guidance, or contact the edit controller manufacturer or your local dealer in the event of difficulty.

Protocols

5 - Protocols

What is a protocol?

The VSA24 II is connected to the edit controller via a serial link, down which commands are sent which tell the VSA24 II what to do, i.e. which channels are to be crossfaded and how long the crossfade should take. There are different formats which these commands can take and this depends on the protocol being used, i.e. different protocols have different ways of saying the same thing. A protocol can be considered to be a language, like French or English, which has its own way of communicating information. The VSA24 II serial interface can be programmed differently to understand different protocols.

The VSA24 II can understand 4 protocols, GVG100, AMX100, ESAM1 or ESAM2.

To select one of these protocols refer to the section on "Selecting the correct jumpers" in Chapter 2 - "How to install the VSA24 II".

GVG100

The GVG100 protocol is designed to control a GVG100 vision switcher. The GVG100 protocol expects a response from the device it is driving, therefore the VSA24 II can either **Eavesdrop** on the serial link between the edit controller and the vision mixer, or it can work in **Reply** mode sending its own response via the serial link.

As the editing controller selects vision or audio crosspoints the audio mixer will fade up the appropriate channel. When the edit controller programs the GVG100 to perform an auto wipe or mix on the background bus, the VSA24 II will generate an up and a down ramp of the selected duration (1 - 255 frames) to the appropriate channel. There are 9 possible selectable channels in the GVG100 protocol, 0 to 8, where 0 means none of channels 1 to 8 are selected, ie.BLACK.

The usual way to program the GVG100 is to select the background crosspoint, the preset crosspoint, the wipe pattern and the transition rate. The GVG100 will perform an auto transition from the background to the preset bus. The VSA24 II will only respond if background, or background and key transitions are selected. The GVG100 commands which are understood by the VSA24 II are described in Fig.5.1. There are no monitoring commands in the GVG100 protocol. When using GVG100 with the VSA24 II, ODD parity should be selected.

AMX100

The AMX100 protocol is used on Grass Valley editors and is designed to provide full control of an audio mixer separately from the video switcher. There is no automatic audio-follow-video. In order for audio and video to agree corresponding commands must be sent separately to the audio mixer and to the video switcher. The AMX100 protocol is identical to GVG100 except that only background commands are output to the mixer. The commands are given in Fig. 5.2..

GVG100 commands recognised by the VSA24 II software

Break	xx					Puts the VSA24 II on line.
03	xx	C1	nn			Will fade up channel nn.
03	xx	C2	nn			Will preset channel nn.
03	xx	F2	xx			Will terminate a transition.
03	xx	FB	OB			Will perform a transition.
03	xx	FB	OB			Push 'AUTO TRANS' button.
03	xx	C6	OB			Push button/lamp 'AUTO TRANS'.
03	xx	CA	X4			Background transition select.
05	xx	CC	4e	Xf	Xg	Will pre-select a transition of efg (in bcd) frames.
05	xx	CC	5e	Xf	Xg	Will pre-select a transition of efg (in bcd) frames.
05	xx	CC	6e	Xf	Xg	Will pre-select a transition of efg (in bcd) frames.
05	xx	CC	7e	Xf	Xg	Will pre-select a transition of efg (in bcd) frames.
05	xx	CC	Ce	Xf	Xg	Will perform a transition of efg (in bcd) frames.
05	xx	CC	De	Xf	Xg	Will perform a transition of efg (in bcd) frames.
05	xx	CC	Ee	Xf	Xg	Will perform a transition of efg (in bcd) frames.
05	xx	CC	Fe	Xf	Xg	Will perform a transition of efg (in bcd) frames.
05	xx	C5	00	xx	nn	Sets amount of crossfade at a given instant. (V1.04 only)

N.B. xx means any hex number.

Figure 5.1

AMX 100 commands recognised by the VSA24 II software

Break	xx					Will put the VSA24 II 'on-line'.
03	xx	C1	nn			Will fade up channel nn.
03	xx	C2	nn			Will preset channel nn.
05	xx	CC	Zn	xn	xn	Select a transition duration of nnn (bcd) frames where Z=0-7.
05	xx	CC	Zn	xn	xn	Perform a transition of nnn (bcd) frames where Z=8 - F.
03	xx	F2	xx			Will terminate a transition.
03	xx	FB	OB			Will perform a transition.
03	xx	C6	OB			Will perform a transition.
03	xx	CA	O4			Will select a background transition.

There are no monitoring commands in AMX 100 protocol.

Figure 5.2

5 - Protocols

ESAM1

ESAM stands for Editing Suite Audio Mixer and is a protocol published by Graham Patten Systems.

This protocol is used for Grass Valley editors. It is uni-directional, therefore it does not expect acknowledgements from the VSA24 II and does not use the BREAK character to establish communications as the other protocols do. The ESAM1 commands understood by the VSA24 II are shown in Fig.5.3. The ESAM1 protocol uses ODD parity.

ESAM2

This protocol is used for Paltex, Abekas, Convergence, Ampex and CMX edit controllers. All these edit controllers use EVEN parity except for Ampex and Abekas which use ODD. Also all edit controllers except Paltex consider the channel numbers to be machine numbers instead of channel numbers. ESAM2 works in REPLY mode. Paltex edit controllers do not provide monitor switching. The commands which are understood by the VSA24 II are given in Fig.5.4.



These protocols should be compared to your Controller and Switcher manuals if some or all of the VSA24 II commands fail to follow the edit controller. Requests for further commands to be recognised should be forwarded to Soundcraft.

Other protocols

Other protocols which have not been implemented for the VSA24 II are SMPTE1 and AMX170.

SMPTE1 is a protocol used solely by AMPEX in the AMPEX VISTA edit controller.

AMX170 is a relatively new protocol which has been specified by Grass Valley.

5 - Protocols

ESAM 1 commands recognised by the VSA24 II software

03	01	nn_1	nn_2	Will fade up channels nn_1 (9-16) and nn_2 (1-8) (left).
03	02	nn_1	nn_2	Will fade up channels nn_1 (9-16) and nn_2 (1-8) (right). Note: No channels will be put on-air or preset until both left and right channels have been programmed.
03	03	nn_1	nn_2	Will preset channels nn_1 (9-16) and nn_2 (1-8) (left).
03	04	nn_1	nn_2	Will preset channels nn_1 (9-16) and nn_2 (1-8) (right).
02	07	nn		Will set a transition of nn frames.
02	09	nn		Will start transition if bit 7 of nn=1.
02	OA	nn		Monitor mixer output if bit 7 of nn=1, *else monitor recorder.*
02	OC	nn		Will fade up channel nn.
02	OD	nn		Will preset channel nn.

Figure 5.3

ESAM 2 commands recognised by the VSA24 II software

BRK	88	A6	03		Put VSA24 II 'on-line'.
03	xx	B4	nn		Will fade up channel nn.
03	xx	B5	nn		Will preset channel nn.
04	xx	A7	xx	nn	Will select a transition duration of nn frames.
04	xx	A8	xx	nn	Will select a transition of nn frames.
03	xx	A9	nn		Start transition if bit 6 or bit 7 of nn=1.
03	xx	AA	nn		Monitor mixer or recorder output left or right as per bits 6/7 of nn. When bit 5 of nn=1 set all mixer channels to silent; fade up previously selected channels when bit 5 returns to 0.
04	xx	A1	aa	bb	Will fade up channels aa only, if in mono or aa and bb if in stereo mode.
04	xx	A2	aa	bb	Will fade up extra channels.
04	xx	A3	aa	bb	Will preset channels aa only, if in mono, or aa and bb if in stereo mode.
04	xx	A4	aa	bb	Will preset extra channels.
02	xx	31			Will output 'VSA24 II' to editor.

Figure 5.4

Appendix 1 - Customising the VSA24 II outputs

The VSA24 II should be switched off and disconnected from the mains supply before any of these changes are implemented.

Each of the buffered voltage outputs from the VSA24 II is able to drive four voltage inputs on a 200BVE mixer. To facilitate the PERMANENT repatching of VSA24 II outputs to 200BVE inputs, there are three Dual-In-Line resistor packages to the rear of the circuit board which allow access to the voltages (see Figure 2.2).

DIL Headers are widely available which should allow the repatching of outputs without permanently soldering resistors into the VSA24 II.

Any buffered output can be connected to any four output pins on the VSA24 II via a resistor of 22 ohms (See Figure A.1). Buffered outputs must NOT be connected together.

These alterations will of course affect **Stereo** and **Manual** modes, and should only be undertaken if the VSA24 II is to be mainly used in **Auto** mode.

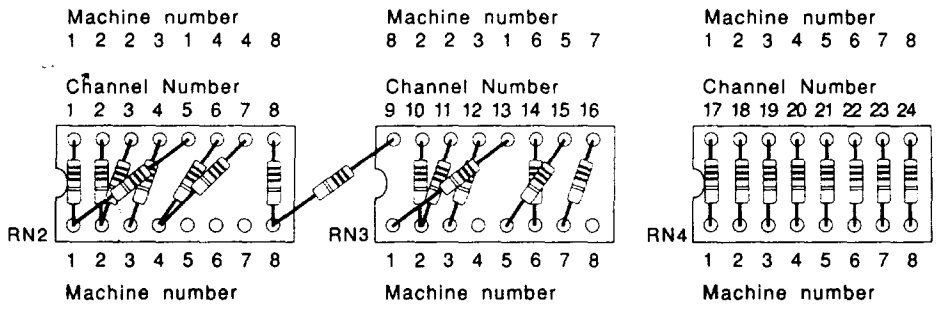


Figure A.1

Appendix 2 - Changing the EPROM

The program for the VSA24 II is stored in an EPROM which is fitted as IC26 to the VSA24 II circuit board. Fig.2.2 shows the position of this component.

Step 2 of the Installation Instructions explains why the EPROM might need changing. If the EPROM does need to be changed follow this procedure:



- **Check that the VSA24 II is switched off and that the mains lead is disconnected from the unit.**
- **If the VSA24 II was connected to the mains then allow three minutes for the power supply potentials to decay.**
- **Touch the metal case to equalise your potential to that of the unit.**
- **Use a fine-bladed screwdriver to ease each end of the EPROM out of its socket or use an IC remover.**
- **Ensure that the pins of the replacement EPROM are aligned with the socket and that none are bent before pushing the EPROM home.**



- **N.B. The EPROM is sensitive to electrostatic discharge, and should be handled in a static-free environment. Do not use magnetic tools or devices when installing the EPROM. Always store EPROMs in conductive foam.**

Appendix 3 - Setting up the Soundcraft 200BVE Audio Mixer

Operating instructions for the Soundcraft 200BVE are given in the manual which comes with the desk. However, in order to ensure that the 200BVE is set up correctly for testing the VSA24 II, the procedure below should be followed:

- Patch two contrasting signals to the line inputs of Channels 1 and 2 of the 200BVE. Set the LINE GAIN on each of these channels to about 30dB. Move the faders down on these two channels and select the LINE inputs by pressing the LINE buttons.
- Route Channels 1 and 2 to MIX by pressing the MIX buttons on each of the channels. Check that for each of these channels the ON button is pressed, and the PFL button is released.
- Listen to the MIX via headphones or speakers and check that you can hear channels 1 and 2 by moving the MIX fader and the two channel faders. (The BVE button on the right of the desk should not be selected at this stage)
- Check that the 15-way cable from the VSA24 is connected to the 'D-type' connector at the rear of the 200BVE. Also check that all sections of the DIP switch at the rear of the 200BVE are in the ON position. This ensures that all the channels will be under the control of the VSA24 II.
- Position the faders of channels 1 and 2 at about -10dB so that there is some volume when the channel is faded up. Position the small (depth-of-fade) faders on each channel at the -infinity position so that there is no volume when the channel is faded down.
- Press the BVE button at the right hand side of the console. The button should light up indicating that the 200BVE is now under the control of the VSA24 II.

Having carried out this procedure you can now continue with the instructions in 'Final Test' in Step 9 of Chapter 2 - 'How to install the VSA24 II'.

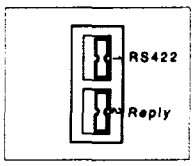
Application Notes

Index of Application Notes

- Abekas 'Solo' System **36**
- Ampex Ace Micro **36**
- Ampex Ace 200 **37**
- Ampex ACE 25 **37**
- Calaway/Quanta Systems **38**
- CMX100 CMX300 **39**
- Convergence ECS-900/195/200 **40**
- For A Company EC-740 **40**
- Grass Valley VPE-141 **41**
- Grass Valley '151' Systems **41**
- M & R Series 3 Systems **42**
- M & R Series 4 Systems **42**
- Paltex 'E' Series Systems **43**
- Sony 900, 910, 9000 **44**
- United Media Systems **45**
- Video Media VLC32 **45**

Application Notes

Switch 10 Positions

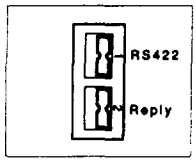


ABEKAS 'SOLO' SYSTEM

Serial Interface	RS422
Baud Rate	38.4K
Parity	ODD
Protocol	ESAM2
Comms Mode	REPLY
Frame Rate	25 FPS

JUMPERS

For 38.4K baud rate:	J8 is FITTED
	J9 is NOT FITTED
For ODD parity:	J15 is NOT FITTED
For ESAM2:	J16 is NOT FITTED
	J17 is NOT FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	UNFITTED: J1, J2, J5, J6, J10



AMPEX ACE-MICRO

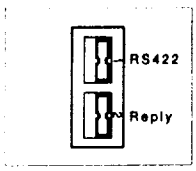
Serial Interface	RS422
Baud Rate	9.6K/38.4K
Parity	ODD
Protocol	ESAM2
Comms Mode	REPLY
Frame Rate	25/30 FPS

JUMPERS

For 38.4K baud rate:	J8 is FITTED
	J9 is NOT FITTED
For 9.6K baud rate:	J8 is NOT FITTED
	J9 is FITTED
For ODD parity:	J15 is NOT FITTED
For ESAM2:	J16 is NOT FITTED
	J17 is NOT FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	UNFITTED: J1, J2, J5, J6, J10

Application Notes

Switch 10 Positions

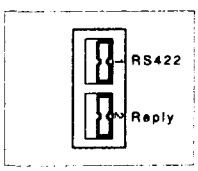


AMPEX ACE-200

Serial Interface:	RS422
Baud Rate:	9.6K/38.4K
Parity:	ODD
Protocol:	ESAM2
Comms Mode:	REPLY
FRAME RATE:	25/30 FPS

JUMPERS

For 38.4K baud rate:	J8 is FITTED
	J9 is NOT FITTED
For 9.6K baud rate:	J8 is NOT FITTED
	J9 is FITTED
For ODD parity:	J15 is NOT FITTED
For ESAM2:	J16 is NOT FITTED
	J17 is NOT FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	UNFITTED:J1, J2, J5, J6, J10



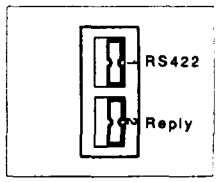
AMPEX ACE-25

Serial Interface	RS422
Baud Rate	38.4K
Parity	ODD
Protocol	GVG100 (V1.06 or later)
Comms Mode	REPLY
Frame Rate	25/30 FPS

JUMPERS

For 38.4K baud rate:	J8 is FITTED
	J9 is NOT FITTED
For ODD parity:	J15 is NOT FITTED
For GVG100:	J16 is FITTED
	J17 is FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	UNFITTED: J1, J2, J5, J6, J10

Switch 10 Positions



CALAWAY/QUANTA SYSTEMS

Serial Interface	RS422
Baud Rate	38.4K
Parity	ODD
Protocol	ESAM1
Comms Mode	REPLY
Frame Rate	30 FPS

JUMPERS

For 38.4K baud rate:	J8 is FITTED
	J9 is NOT FITTED
For ODD parity:	J15 is NOT FITTED
For ESAM1:	J16 is FITTED
	J17 is NOT FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	NOT FITTED: J1, J2, J5, J6, J10

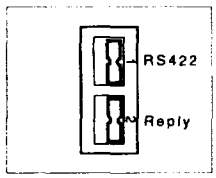
cable connection:

The following interfacing cable will need to be constructed. Quanta supplies a cable that fans out their control port to the preview switcher and the audio mixer. This should be wired to VSA24 II in the following manner

	QUANTA 15 WAY 'D' to	9 WAY 'D' to	VSA24 II SERIAL IN 9 WAY 'D
PIN NO.	9	1	1 (GND)
	10	2	2 (DATA TO ED -ve)
	11	7	7 (DATA TO ED +ve)
	12	8	8 (DATA FROM ED -ve)
	13	3	3 (DATA FROM ED +ve)

Application Notes

Switch 10 Positions



CMX100 SYSTEMS

Serial Interface	RS422
Baud Rate	38.4K
Parity	EVEN
Protocol	ESAM2
Comms Mode	REPLY
Frame Rate	25/30 FPS

JUMPERS

For 38.4K baud rate:	J8 is FITTED
	J9 is NOT FITTED
For EVEN parity:	J15 is FITTED
For ESAM2:	J16 is NOT FITTED
	J17 is NOT FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	UNFITTED: J1, J2, J5, J6, J10

The CMX editors use an I^2 interface that must contain the proper EPROM for communication to an audio mixer. The designation on the CMX EPROM must contain an 'A' after the switcher type to be correct. EXAMPLE: GVG100A

The I^2 interface also contains two 25-WAY 'D' type connectors labelled:

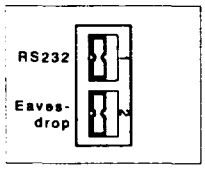
- 'Machine 1' (connect this to the switcher)
- 'Auxilliary Machine 2' (connect this to the VSA24 II Serial In)

You will need to use or make a cable with the following connections

	25 WAY 'D' type	9 WAY 'D' type
Pin NO.	21	2 (DATA TO ED -ve)
	22	7 (DATA TO ED +ve)
	23	8 (DATA FROM ED -ve)
	24	3 (DATA FROM ED +ve)
	7	4 (GND signal)
	1	9 (GND chassis)

Application Notes

Switch 10 Positions

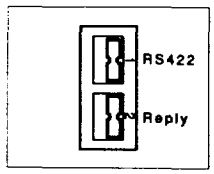


CONVERGENCE ECS-900/195/200

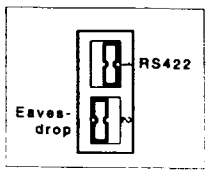
Serial Interface	RS232
Baud Rate	9.6K
Parity	ODD
Protocol	GVG100
Comms Mode	EAVESDROP
Frame Rate	25/30 FPS

JUMPERS

For 9.6K baud rate:	J8 is NOT FITTED
	J9 is FITTED
For ODD parity:	J15 is NOT FITTED
For GVG100 :	J16 is FITTED
	J17 is FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	NOT FITTED: J1, J2, J5, J6, J10



OR :



FOR A COMPANY EC-740

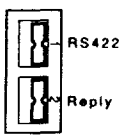
Serial Interface	RS422
Baud Rate	38.4K
Parity	ODD
Protocol	GVG100
Comms Mode	EAVESDROP
Frame Rate	25/30 FPS

JUMPERS

For 38.4K baud rate:	J8 is FITTED
	J9 is NOT FITTED
For ODD parity:	J15 is NOT FITTED
For GVG100 :	J16 is FITTED
	J17 is FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	NOT FITTED: J1, J2, J5, J6, J10

Application Notes

Switch 10 Positions

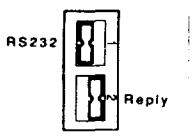


GRASS VALLEY VPE-141

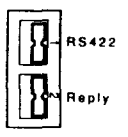
Serial Interface	RS422
Baud Rate	38.4K
Parity	ODD
Protocol	AMX100
Comms Mode	REPLY
Frame Rate	25/30 FPS

JUMPERS

For 38.4K baud rate:	J8 is FITTED
	J9 is NOT FITTED
For ODD parity:	J15 is NOT FITTED
For AMX100 :	J16 is NOT FITTED
	J17 is FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	NOT FITTED: J1, J2, J5, J6, J10



OR :



GRASS VALLEY '151' SYSTEMS

Serial Interface	RS232/RS422
Baud Rate	9.6K/38.4K
Parity	ODD
Protocol	AMX100
Comms Mode	REPLY
Frame Rate	25/30 FPS

JUMPERS

For 38.4K baud rate:	J8 is FITTED
	J9 is NOT FITTED
For ODD parity:	J15 is NOT FITTED
For AMX100:	J16 is NOT FITTED
	J17 is FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	NOT FITTED: J1, J2, J5, J6, J10

Note: Grass Valley 141/151 must use VSA software V2.04 or later

Application Notes

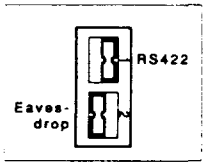
Switch 10 Positions

M&R SERIES 3 SYSTEMS

Serial Interface	RS422
Baud Rate	38.4K
Parity	ODD
Protocol	AMX100
Comms Mode	EAVESDROP
Frame Rate	30 FPS

JUMPERS

For 38.4K baud rate:	J8 is FITTED
	J9 is NOT FITTED
For ODD parity:	J15 is NOT FITTED
For AMX100:	J16 is NOT FITTED
	J17 is FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	NOT FITTED: J1, J2, J5, J6, J10

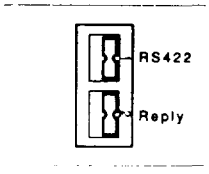


M&R SERIES 4 SYSTEMS

Serial Interface	RS422
Baud Rate	38.4K
Parity	ODD
Protocol	ESAM2
Comms Mode	REPLY
Frame Rate	30 FPS

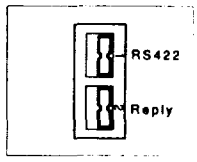
JUMPERS

For 38.4K baud rate:	J8 is FITTED
	J9 is NOT FITTED
For ODD parity:	J15 is NOT FITTED
For ESAM2:	J16 is NOT FITTED
	J17 is NOT FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	NOT FITTED: J1, J2, J5, J6, J10

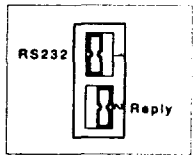


Application Notes

Switch 10 Positions



OR :



PALTEX 'E' SERIES SYSTEMS

Serial Interface	RS232/RS422
Baud Rate	9.6K/38.4K
Parity	EVEN
Protocol	ESAM2
Comms Mode	REPLY
Frame Rate	25/30 FPS

JUMPERS

For 38.4K baud rate:	J8 is FITTED
	J9 is NOT FITTED
For 9.6K baud rate:	J8 is NOT FITTED
	J9 is FITTED
For EVEN Parity:	J15 is FITTED
For ESAM2:	J16 is NOT FITTED
	J17 is NOT FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	NOT FITTED: J1, J2, J5, J6, J10

Paltex provides Ports A-D for serial connections. Port 'B' is usually for the audio switcher.

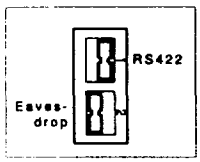
A 9-WAY, PIN FOR PIN, cable is used to connect PORT B to the 'Serial In' port on the VSA24 II.

Make sure that the Paltex edit controller has the proper EPROM fitted for ESAM communication on the port which is connected to the VSA24 II.

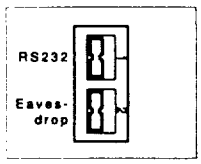
Paltex 'E' Series editor systems do not support monitor switching.

Application Notes

Switch 10 Positions



OR :



SONY 900, 910, 9000

Serial Interface	RS232/422
Baud Rate	38.4K
Parity	ODD
Protocol	GVG100
Comms Mode	EAVESDROP
Frame Rate	25/30 FPS

JUMPERS

For 38.4K baud rate:	J8 is FITTED
	J9 is NOT FITTED
For ODD parity:	J15 is NOT FITTED
For GVG100 :	J16 is FITTED
	J17 is FITTED
Other jumpers:	FITTED: J3, J4, J7, J11
	NOT FITTED: J1, J2, J5, J6, J10