

TRITON routing switcher

Multimedia Router 8x8

Product model no. TTN-BAV-0808



INSTALLATION MANUAL

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the most watched worldwide

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Electromagnetic Radiation Notice

The following information is given to note compliance with the United States Government Federal Communications Commission (FCC) Rules (47 CFR Part 15) designed to limit interference to radio and TV reception. The ruling establishes measurement procedures and frequency criteria for Class A computing devices (commercial and industrial applications) with the following conduction and radiation limits:

CLASS A COMPUTING DEVICE: CONDUCTION LIMIT (Part 15.812)

<i>Frequency (MHz)</i>	<i>Maximum RF Line Voltage (uV)</i>
0.45 - 1.6	1000
1.6 - 30	3000

CLASS A COMPUTING DEVICE: RADIATION LIMIT (Section 15.810)

<i>Frequency (MHz)</i>	<i>Distance (meters)</i>	<i>Field Strength (uV/m)</i>
30 - 88	30	30
88 - 216	30	50
216 - 1000	30	70

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NOTE

Interference to Radio Communications

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Revision history

Current revision of this document is the uppermost in the table below.

Revision	Replaces	Date	Change Description
0	-	18/03/03	Initial Revision

1 General

The Media-8 is an RGBHV Analogue Video + Stereo Analogue Audio (optional) 8x8 Router for Multimedia applications. The Video Router has seamless tri-step switching, or vertical interval switching, and a large signal bandwidth, which provides high performance up to 1600x1200 resolution. The Audio Router has balanced inputs and outputs, and audio breakaway allows selecting audio independent from video. A preset editor allows the user multi-crosspoint settings in one operation, and multi panel interface allows control of the router from up to 20 different sites.

This top of the line Router provides high performance circuits in SMD technology, with no discernible signal degradation. The built-in RS-232 interface allows the user to control the router via the Triton Router Control System PC software with many operational features. The control bus allows linking of the unit to other Triton Routers and Control Panels, all designed to suit the needs of the user.

The following formats may be configured (stereo audio is optional):

8x8 RGBHV + AA

1.1 Specifications

1.1.1 Video Specifications

Frequency response:	0-250MHz / -3dB; 0-400MHz / -6dB
Differential gain:	typical 0.1% (3.58/4.43MHz)
Differential phase:	typical 0.2° (3.58/4.43MHz)
Crosstalk:	< -55dB (3.58/4.43MHz)
Video S/N Ratio:	typical 70dB
Bar tilt:	< 0.1%
Lum. Non-linearity:	< 0.1%
Number of inputs:	8
Number of outputs:	8
Impedance:	75 ohms
Return loss:	typical 38dB
Max signal:	2 Vp-p
Coupling:	DC
DC offset:	typ. 5mV
Propagation delay:	5ns ± 1ns
Connector:	BNC
Switching:	Seamless w/ variable delay 2-5s, or VIT, Selectable via DIP-switches PAL/NTSC selection on DIP-switches VIT loop

1.1.2 (Optional) Audio Specifications

Frequency response:	20Hz-100kHz ± 0.1dB
Crosstalk:	> -100dB
Click noise:	< 80dBqp
THD+N:	< 0.003%
SNR:	> 100dB ref. to 0db 20Hz-20kHz
Number of inputs:	8 (Stereo) true balanced
Input impedance:	> 10k ohms
CMRR:	> 75dB
Max. Input level:	+ 25dBu
Number of outputs:	8 (Stereo) true balanced
Output impedance:	66 ohms
Connector:	DB25 female

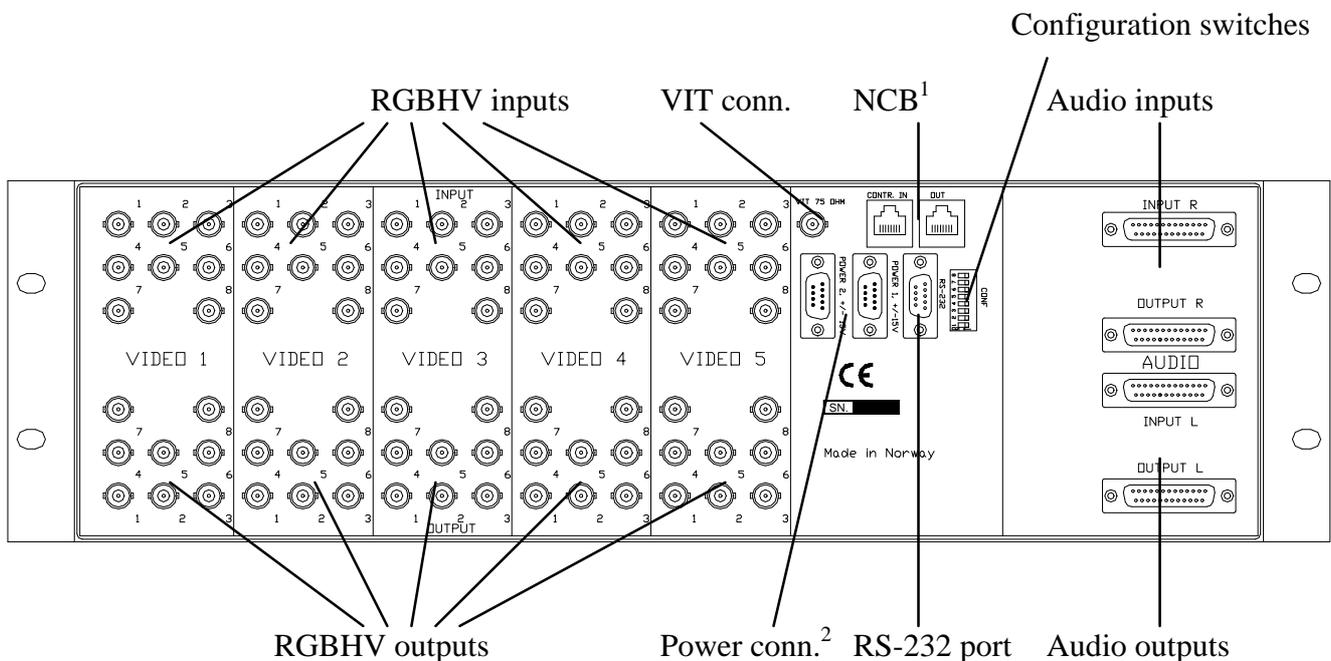
1.1.3 Panel Specifications

Salvos: Programmable/executable on panel

1.1.4 General Specifications

AC power:	External power supplies 100 - 260 VAC
DC power:	±15V, connector DB9 male, Equipped with 2x DB9 connectors
Max power consumption:	<20W
Dimensions:	483 x 132 x 35 mm (19", 3RU)

1.2 Connection drawing



¹ Network Control Bus. The protocol of this bus is equal, and compatible to the MIDI bus protocol.

² BAV-0808 has 2 power connectors, allowing redundant power supplies.

2 Power connection

Do not connect mains to the desktop power supply before connecting the power supply to the router.

Connect the DB9 female connector from the desktop power supply to the main unit. Tighten the screws to assure a proper contact. To connect mains to the desktop power supply you need a mains cord with IEC 320 connector.

The BAV-0808 is normally delivered with the desktop power model **AC ±15V / 30W**. Upon customer request, BAV-0808 can also be delivered with **DC ±15V / 30W**, which may be fed by a 36 – 72 VDC mains power source. A Frame mounted power supply solution is also available.

Please refer to the latest Triton Product Catalogue for power supply types, or call Thomson Grass Valley for this information.

If any third party power supply is used the BAV-0808 router requires ±15V DC with a minimum current of 650mA. The following pin-out is used on the DB9 male power connector:

Pin 1	0V
Pin 4	+15V
Pin 8	-15V

3 Connecting the BAV-0808 to your PC

For connection to a PC with Triton Router Control System, the RS-232 interface is used. The RS-232 port on all Triton devices uses the standard DCE pin-out, see pin-out table under 4.3.

A standard modem cable can be used for connecting the router to the PCs serial port.

3.1 Selection of router level

The router level depends on the system configuration the router is going to work with. See chapter 5 for more information. All routers are delivered with default level 1. Triton Router Control System offers the control of up to 16 different routers or combinations of routers.

3.2 Pin-out of RS-232 connector

The DB9 female connector for the RS-232 port has the following pin-out:

Pin 2	Tx
Pin 3	Rx
Pin 5	GND

3.3 Maximum cable length

The maximum cable length for an RS-232 connection is per definition 15m. Longer distances can be installed depending on the environmental conditions of the installation site. It is the responsibility of the installer / user to secure a proper installation of the RS-232 connection.

4 NCB connection

Via the Network Control Bus system several routers and control panels can be interconnected. The standard MIDI interface is used on all NCB control ports. The BAV-0808 router utilises RJ45 connectors for connecting to the NCB. This means that when you connect your BAV-0808 router to other Network devices, with 5-PIN DIN connectors, an RJ45 to 5-pin DIN interface is necessary.

This converter can be ordered from Thomson Grass Valley.

The NCB system allows connection of up to 16 routers with different levels on the same bus. Control panels dedicated to work with a specific router must be configured to the same level as the router. Several panels can work together with one specific router. Up to 16 single routers or combinations of routers can be controlled from the Triton Router Control System. The NCB system and all RS-232 ports interchange the system status.

4.1 Several routers in one system

The NCB system allows the interconnection of up to 16 routers with different levels in one system. A combination of routers working married counts as one level. This might for example be 1 audio router + 1 video router working as an audio follows video system or 3 video routers working as an RGB (YUV) system. The routers in such a constellation must be configured to the same level.

4.2 Connecting control panels

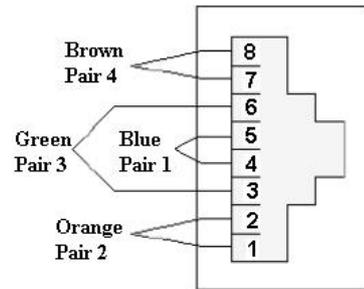
To get a control panel working with a specific router, configure the control panel to the same level as the router. Several panels can be configured to control the same router. The Triton panels can control 2 levels with breakaway function. If it is necessary to control more levels with breakaway an additional panel must be used. **Panels can also be connected to a router via the RS-232 interface. Please refer to your control panel manual for installation.**

4.3 Pin-out and cable type

4.3.1 RJ45 connectors

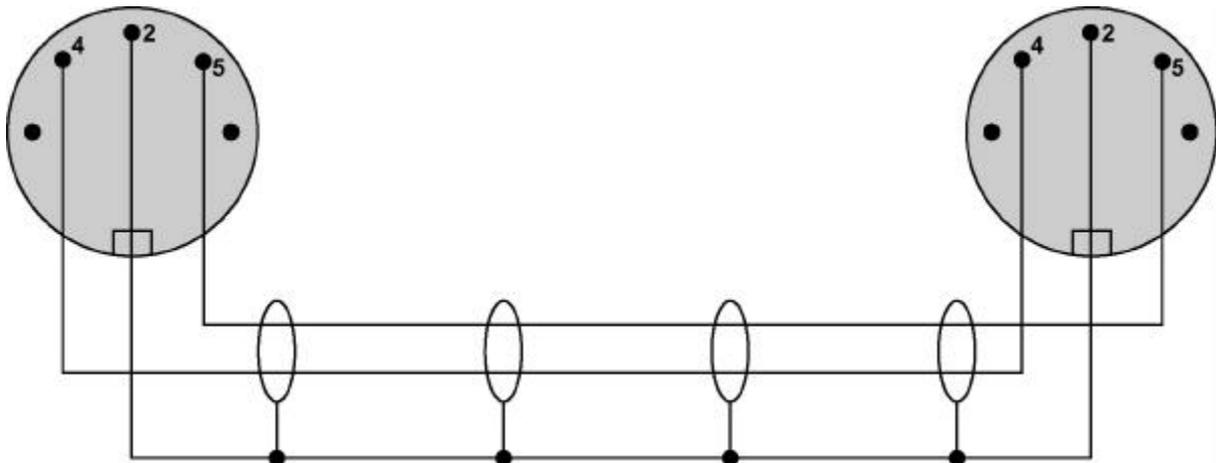
On some Triton devices, including the BAV-0808, the NCB cable can be connected to RJ-45 connectors. The following pin-out is used:

- Pin 1 = Not Connected
- Pin 2 = Not Connected
- Pin 3 = Not Connected
- Pin 4 = data
- Pin 5 = data
- Pin 6 = Not Connected
- Pin 7 = Not Connected
- Pin 8 = Not Connected



4.3.2 5-pin DIN connectors

However, the pin-out of most Network Control Bus ports follows the standard MIDI specification. A 1:1 cable with 5pin DIN connector is used. The following pin-out is used:

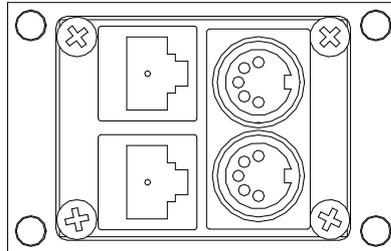


- Pin 1 = Not Connected
- Pin 2 = shield
- Pin 3 = Not Connected
- Pin 4 = data
- Pin 5 = data

The standard MIDI specification recommends the use of shielded twisted pair cable types for interconnection between the units.

4.3.3 RJ45 to 5-pin DIN converter

In configurations that include both devices with RJ45 connectors, and devices with 5-pin DIN connectors, an RJ45 to 5-pin DIN converter may be used to complete the control loop. This converter holds both connector types, and may work both ways, thus from RJ45 to 5-pin DIN, as well as from 5-pin DIN to RJ45.



The converter is connected as follows:

RJ45 (Router/CP)	RJ45 (Converter)	5-pin DIN (Converter)	5-pin DIN (Router/CP)
IN	IN	IN	OUT
OUT	OUT	OUT	IN

4.4 Control bus structure

The Network Control Bus structure follows the standard MIDI bus definition. The NCB is defined as a closed chain of units. This means that the NCB OUT of the last unit must be connected to the NCB IN of the first unit in the NCB chain. To avoid problems with the control of Triton units the installer/user has to assure that the bus structure is installed according to this definition. The total number of Triton devices in an NCB chain is limited to 20.

4.5 Maximum distance between NCB devices

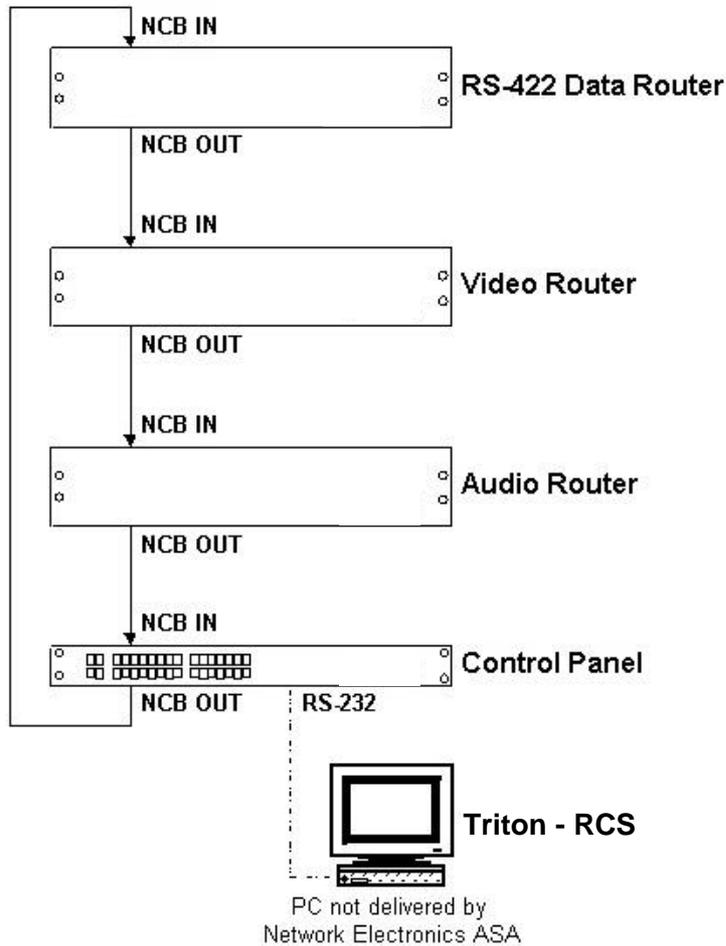
The standard MIDI definition allows a maximum cable length of 250 meters between two devices. Longer distances can be made with MIDI repeater units. To avoid grounding problems all NCB ports have opto-coupled inputs.

4.6 Control Bus configuration notes

In order to achieve a system that is easy to maintain and control, follow the important notes, presented hereunder.

- *Avoid using routers of different size, but same signal type (audio/video), on the same level.*
 Example: Do not configure a system with a BVS-1616 and a BVS-0808 on the same level. If they were on the same level, crosspoint commands that were sent to the BVS-1616 lying outside the range of the BVS-0808 would not be executed; the BVS-0808 would throw them off the bus. However, a combination of a BVS-1616 and an BAS-0808 will work well, because commands are different for video- and audio routers.
- *Try to limit the number of devices on one Control Bus loop.* If possible, separate systems that are not to be controlled by one central control panel.
 If you need to have several systems in one loop, try to separate as follows, using the DIP switches on the rear of the devices:
 - Analogue Video + Analogue Audio + CP for analogue system on Level 1
 - SDI + AES/EBU + CP for digital system on Level 2

- RS-422 Data + CP for data on Level 3
- Universal Control Panel to control all devices above, with user configurable default level.
- Pay attention to the figure below, in order to achieve full controllability of all devices in the loop.



Note!
The Video and Audio Routers may swap positions in the loop. However, they **MUST** be positioned **AFTER** the RS-422 Data Router. The Control Panels **must** be the **last** devices before closing the loop.

- Complete the Control loop, by connecting all Control bus connections to all Triton devices, before powering up any Triton device.

5 Router configuration

There are 8 DIP switches on the rear side of the BAV-0808. They have the following meaning:

5.1 Router level

Switches 1 - 3 on the configuration switch set the router's level for communication with the Triton Router Control System, and other units in the NCB system. The panels on the NCB dedicated to operate with the router must be configured to the same level as that router.

If several routers are combined to form an audio follows video, RGB or similar system, these routers must be configured to the same level.

The levels can be switched according to the following pattern:

- means switch down
- * means switch up

Default level is 1.

Switch	1	2	3	Level
	-	-	-	1
	-	-	*	2
	-	*	-	3
	-	*	*	4
	*	-	-	5
	*	-	*	6
	*	*	-	7
	*	*	*	8

5.2 Video Switch-timing mode

The BAV-0808 router allows switching video in different timing modes. Switches 4 - 6 on the configuration switch set this video switch-timing mode.

The timing modes can be switched according to the following pattern:

- means switch down
- * means switch up

Switch	4	5	6	Switch Timing mode
	-	-	-	No VIT; immediate switching
	-	-	*	1 sec. Delayed RGB switching
	-	*	-	2 sec. Delayed RGB switching
	-	*	*	3 sec. Delayed RGB switching
	*	-	-	4 sec. Delayed RGB switching
	*	-	*	5 sec. Delayed RGB switching
	*	*	-	Not used
	*	*	*	VIT switching

Default timing mode is No VIT.

When RGB switching is applied, the Video routers 1, 2, and 3 will be switched in a special manner. When a new status is received, via buttons in front, or serial connections, the video switchers 4, and 5, as well as the audio, will be connected to the new input immediately. The video 1, 2, and 3 however, will instead turn “black” (no signal on input) for the selected delay period. After this delay period, the new input will be presented on the output.

5.3 Disconnect Allowed

This function allows the disconnection of an output from an input. If the user pushes the input button for the currently selected output a second time, the selected output will be disconnected. This works for both video and audio. The video output(s) will become “black”, and the audio output(s) will become silent.

Switch 7 on the configuration switch enables or disables this function.

The Disconnect function can be switched according to the following pattern:

- means switch down
- * means switch up

Switch	7	Disconnect Allowed
-		Disconnect Allowed
*		Disconnect not allowed

Default is Disconnect Allowed.

5.4 Power up mode

Switch 8 on the configuration switch defines the power up mode. The BAV-0808 router provides two modes for powering up the system.

Mode 1 switches all outputs to input 1.

Mode 2 switches all outputs according to the buffered information in the routers processor system.

The power up reset can be switched according to the following pattern:

- means switch down
- * means switch up

Switch	8	Power Up Reset
-		Mode 2
*		Mode 1

Default is Mode 2.

5.5 Programming of restrictions

If the user enables the Restrictions option, the previously programmed restrictions will be fetched from the on-board memory during power-up. Putting the panel in “Restrictions Programming mode” may program new restrictions. This is done, starting from Panel Disable state, by pushing and holding “V/A toggle”, “Take On/Off” and “Take” and then pushing “Panel Enable”. Blinking “Panel Enable” and “Take” indicates “Restrictions Programming mode”.

All the legal inputs for the selected output are shown by orange light in button. Pushing the appropriate input button does the Legal/Illegal toggle. When a new output is selected, the programming of the previous output is saved in the on-board memory and the old setting of the new output is fetched from the on-board memory.

After all necessary programming is done; pushing Panel Disable stops the programming mode.

Disabling an output completely is done by disabling all inputs for the given output. When in normal mode these outputs may be selected for viewing the status, but not controlled.

6 Connecting signal cables to the BAV-0808

6.1 Connecting Video Signals

The BAV-0808 router offers standard 75 ohms BNC connectors for video in- and outputs. All video inputs are terminated with 75 ohms.

6.2 Connecting Audio Signals

Below you will find our standard pin-out for DB25 audio contacts. This pin-out is used for both analogue and digital audio routers. The same standard is used by Tascam and Fostex.

Channel 1:	+ 24	- 12	Gnd 25
Channel 2:	+ 10	- 23	Gnd 11
Channel 3:	+ 21	- 9	Gnd 22
Channel 4:	+ 7	- 20	Gnd 8
Channel 5:	+ 18	- 6	Gnd 19
Channel 6:	+ 4	- 17	Gnd 5
Channel 7:	+ 15	- 3	Gnd 16
Channel 8:	+ 1	- 14	Gnd 2

All audio contacts used on the routers are female type.

6.2.1 Unbalanced audio signals on BAV-0808 outputs

If you want to use the BAV-0808 with unbalanced audio signals you connect these signals according to the following table:

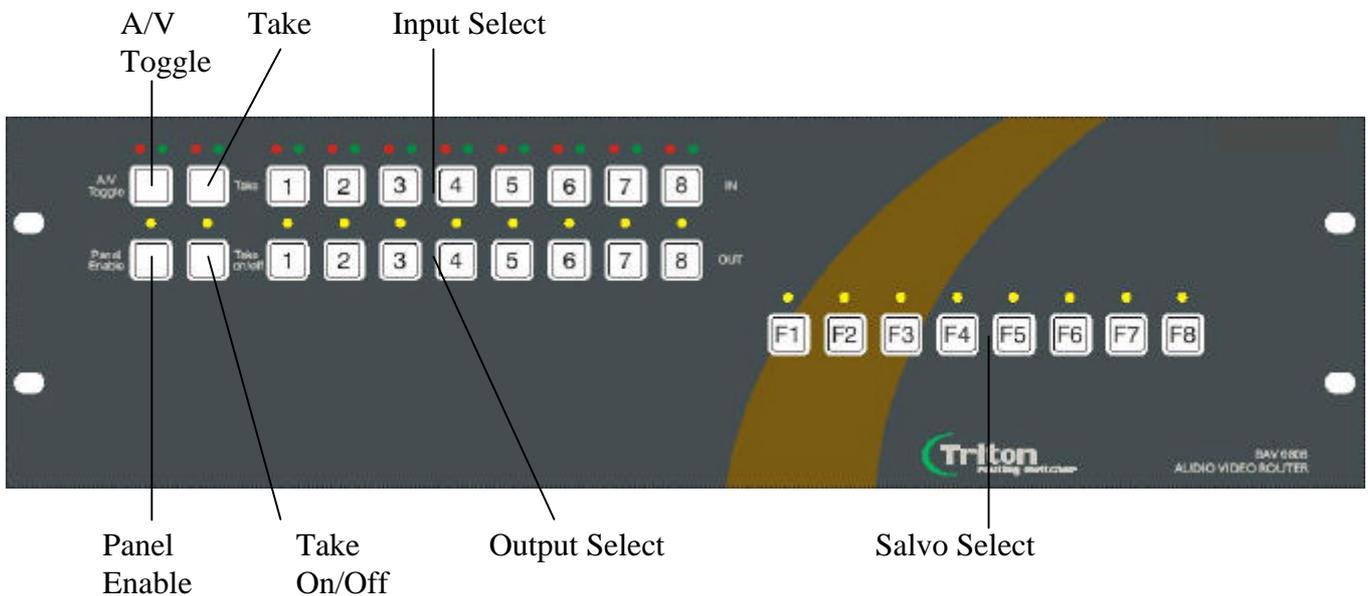
Triton device	Unbalanced signal connection
‘+’	Audio
‘-’	Shield
‘GND’	Shield

7 Control panel operation

The built-in panel in the BAV-0808 offers 8 input select buttons on the top row. The input buttons are equipped with two LED indicators for displaying both video and audio status during breakaway operations. The bottom row selects the 8 router outputs. The last selected output will be indicated with the LED. On the left hand side the panel provides 4 function keys with following functions:

- TAKE Executes the last operation
- TAKE ON/OFF Enables / disables Take function
- A/V TOGGLE Enables Audio, Video or AFV
- PANEL ENABLE Enables panel

7.1 Front panel drawing



7.2 PANEL ENABLE button

After powering-up the control panel will be disabled. The LED`s in the buttons are only half illuminated. Press the PANEL ENABLE button to start operating. If you want to lock the control panel after use you simply disable by operating the PANEL ENABLE button once again.

7.3 V/A TOGGLE button

After powering-up the control panel will operate audio follow video. The red and green LED on the V/A TOGGLE button are illuminated. By operating the V/A toggle button you can select the layer you want to switch. Red LED illuminated means only audio. Green LED illuminated means only video.

7.4 Operating crosspoints

Operating crosspoints is an easy task with BAV-0808. First you select the output you want to operate on the *output button* row. With the next operation you select one of the inputs on the *input button* row. The crosspoint operation will be executed while pressing the input button.

7.5 TAKE function

The BAV-0808 provides a TAKE function, which can be activated by pressing the TAKE ON/OFF button. The TAKE ON/OFF button will show green light if the TAKE function is activated. After selecting output and input like described under 7.4 the INPUT button and the TAKE button will start to blink. The crosspoint operation will be executed by pressing the TAKE button. If you work with video/audio breakaway you can first select the video layer, afterwards the audio layer and finally execute both operations at the same time with the TAKE button.

8 Programming of SALVOS (Pre-sets)

The BAV-0808 allows 8 user programmable salvos (pre-sets). The salvos are addressed via the function buttons F1-F8, on the right half of the panel front.

A Salvo is a complete set-up of all the outputs of the router by the push of a single button. When TAKE is not enabled, pushing one of the Salvos will immediately perform the switching programmed to that button. The full status of the router will also be sent to the NCB, and RS-232 port. The light will be lit in the Salvo button, indicating a successful Salvo operation. The light will stay on until any changes are done on any of the outputs.

When TAKE is enabled, the light in the Salvo button will start to blink when it is pushed, and so will the light in the TAKE button. The Salvo is not activated until the TAKE button is pushed. The light in the Salvo button will go steady, until any changes are done on any of the outputs.

While in Panel disable mode, holding the rightmost Salvo button, the TAKE On/Off button, and the A/V Toggle button, then pushing Panel Enable will engage the “Salvo Programming mode”.

The light will indicate the currently selected Salvo button. Pushing a different Salvo button at any time will store any changes done to the previously selected Salvo, and then selecting the new one. The currently stored Salvo operation will be shown for one output at a time. There are 3 types of Salvo operation:

1. *Leave output unchanged.* This works for either video, or audio, or both. When there is no light in the A/V Toggle button, both A+V will be unchanged for this output. When only the red light is showing, the video will be left unchanged, and when only the green light is showing, the audio will be left unchanged.
2. *Disconnect output.* This works for either video, or audio, or both. When the green light (or both red and green) is showing in the A/V Toggle, but there is no green light in any of the input buttons, this indicates that the video will be disconnected for the current output. Similarly, if the red light (or both red and green) is showing in the A/V Toggle, but there is no red light in any of the input buttons, this indicates that the audio will be disconnected for the current output. If both the red and green lights are showing in the A/V Toggle, but there is no light in any of the input buttons, this indicates that both video and audio will be disconnected for the current output.
3. *Connect to given input.* If an input button is showing a green light, the video will connect this input to the current output. If an input button is showing a red light, the audio will connect this input to the current output.

The operation for a given output of a given Salvo is stored in the on-board memory when a new output is selected, or when a new salvo is selected, or when the Panel Enable button is pushed again, the latter terminating the “Salvo Programming mode”.

When programming the salvos, use the A/V Toggle button to program separate operations for video and audio (breakaway). When using breakaway, remember that only the chosen layer (video and/or audio) will be subject to switching when the setting is stored.

Example: If only the red light is lit in the A/V Toggle button when the next output is selected, the video will be left unchanged for the previous output.

Disconnect output is programmed by pushing the selected input a second time, same as for normal operation. Remember that the green (video) and/or red (audio) light in the A/V Toggle button must be lit, in order to program, or disconnect. If not, an “unchanged” command is stored instead.

An example of how to program salvos on the BAV-0808 is shown hereunder.

Example:

The following configuration is applicable in the example:

- *IN1*: VGA Video from PC + PC audio
- *IN2*: VHS Video Player.
- *IN3*: DVD Player
- *IN4*: CD Player (Only Audio)
- *IN5*: Cassette Player (Only Audio)
- *OUT1*: VGA input on Projector + Audio Amplifier
- *OUT2*: Composite input (V+A) on Projector

The salvo's we want are the following:

- *F1*: V_{in1} to V_{out2} + A_{in1} to A_{out1} , (all other inputs shall be disconnected)
- *F2*: V/A_{in2} to V/A_{out1} , (all other inputs shall be disconnected)
- *F3*: V/A_{in3} to V/A_{out1} , (all other inputs shall be disconnected)
- *F4*: A_{in4} to A_{out1} , (all other inputs shall be disconnected)
- *F5*: A_{in5} to A_{out1} , (all other inputs shall be disconnected)
- *F8*: All inputs (V+A) to any outputs shall be disconnected

Step 1. Engage “*Salvo Programming Mode*” (See above for instructions).

Step 2. - Push “**F1**”,
 - Push “**OUT1**”,
 - Push “**A/V Toggle**”, and select A+V (Red + Green light),
 - Disconnect all inputs, i.e. No inputs are lit,
 - Push “**A/V Toggle**”, and select Audio (Red light),
 - Push “**IN1**”
 - Push “**OUT2**”,
 - Push “**A/V Toggle**”, and select A+V (Red + Green light),
 - Disconnect all inputs, i.e. No inputs are lit,
 - Push “**A/V Toggle**”, and select Video (Green light),
 - Push “**IN1**”
 - Push “**OUT3**”,
 - Push “**A/V Toggle**”, and select A+V (Red + Green light),
 - Disconnect all inputs, i.e. No inputs are lit,
 - Repeat the last three lines for all outputs 4 – 8 too.

Step 3. - Push “**F2**”,
 - Push “**OUT1**”,
 - Push “**A/V Toggle**”, and select A+V (Red + Green light),
 - Push “**IN2**”
 - Push “**OUT2**”,

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- Push “**A/V Toggle**”, and select A+V (Red + Green light),
 - Disconnect all inputs, i.e. No inputs are lit,
 - Repeat the last three lines for all outputs 3 – 8 too.
- Step 4.
- Push “**F3**”,
 - Push “**OUT1**”,
 - Push “**A/V Toggle**”, and select A+V (Red + Green light),
 - Push “**IN3**”
 - Push “**OUT2**”,
 - Push “**A/V Toggle**”, and select A+V (Red + Green light),
 - Disconnect all inputs, i.e. No inputs are lit,
 - Repeat the last three lines for all outputs 3 – 8 too.
- Step 5.
- Push “**F4**”,
 - Push “**OUT1**”,
 - Push “**A/V Toggle**”, and select A+V (Red + Green light),
 - Disconnect all inputs, i.e. No inputs are lit,
 - Push “**A/V Toggle**”, and select Audio (Red light),
 - Push “**IN4**”
 - Push “**OUT2**”,
 - Push “**A/V Toggle**”, and select A+V (Red + Green light),
 - Disconnect all inputs, i.e. No inputs are lit,
 - Repeat the last three lines for all outputs 3 – 8 too.
- Step 6.
- Push “**F5**”,
 - Push “**OUT1**”,
 - Push “**A/V Toggle**”, and select A+V (Red + Green light),
 - Disconnect all inputs, i.e. No inputs are lit,
 - Push “**A/V Toggle**”, and select Audio (Red light),
 - Push “**IN5**”
 - Push “**OUT2**”,
 - Push “**A/V Toggle**”, and select A+V (Red + Green light),
 - Disconnect all inputs, i.e. No inputs are lit,
 - Repeat the last three lines for all outputs 3 – 8 too.
- Step 7.
- Push “**F8**”,
 - Push “**OUT1**”,
 - Push “**A/V Toggle**”, and select A+V (Red + Green light),
 - Disconnect all inputs, i.e. No inputs are lit,
 - Repeat the last three lines for all outputs 2 – 8 too.
- Step 8.
- Push “**Panel Enable**”, to save all salvos, and stop programming.
- Step 9.
- Push “**Panel Enable**” again, to enable operation of the BAV-0808 again.

This completes the programming example.

9 Control and connection of Triton systems, interface protocol

9.1 Important notes regarding the Triton Control Protocol

9.1.1 Binary Code

The strings shown on the next pages are in binary coded format. Please be aware of the fact that any terminal program you may use to control a Triton unit from a PC must be able to generate hexadecimal characters. ASCII characters will not be accepted.

9.1.2 Echo

A matrix will reply on a crosspoint set command with an ECHO. In the case where a crosspoint is already set no ECHO will be sent. If the matrix is part of an NCB system two types of reply will be sent. Immediately after receiving the crosspoint set command the ECHO will be sent. The matrix will then wait for the command to pass the NCB system. After receiving the command from the NCB system the matrix will send the command as an ACKNOWLEDGE.

9.1.3 RS-422 Matrixes

RS-422 Data Routers do not accept distribution of an input signal to several outputs. An input signal can only be routed to one single output. The Firmware of our RS-422 routers takes care of these limitations. If an input (Source) is already connected to a particular output (Destination) any connection of this input to another output would disconnect the previous connection. The router will in this case send the following message for the disconnected output: Output connected to input 128. Input 128 is an internal default for the disconnect status. Please see Triton recommendations for use of RS-422 data routers for further information.

9.1.4 Timeout

The Crosspoint Status Request message has a timeout, which means that you need to wait 1 second in between request messages.

9.2 Basic principles

Any message on any level (address) that conforms to the standard arriving at either the NCB or the RS232 port will be re-sent on both NCB and RS232. The only exceptions are:

- a) A matrix that recognizes its address will not re-transmit the message if the crosspoint is already set.
- b) A matrix that recognizes its address will not re-transmit the message if the output number or input number exceeds its size.
- c) A unit (matrix or panel) will not re-transmit a message arriving at the NCB if it was re-transmitted a short while ago (typically 0.5 sec). This is done by grabbing a message storing it for the timeout period, and comparing it with new messages. After the timeout period the unit will grab a new message for compare. This is done to remove unwanted (read: unknown) messages from the NCB ring.
- d) A message arriving at the RS232 will always be re-transmitted unless it is a matrix, and one of the cases a) or b) is fulfilled.

9.2.1 Example: A single unit with no NCB connected

Messages sent to the RS232 of a single unit will be returned once no matter what address or input/output number the message has, unless it is a matrix which recognizes one of the conditions a) or b) above.

9.2.2 Example: Several units connected by NCB

Messages sent to the RS232 of a single unit will be returned once no matter what address or input/output number the message has, unless it is a matrix which recognizes one of the conditions a) or b) above.

If none of the cases a) or b) is fulfilled the message will also be transmitted on the NCB. Then if any unit on the NCB ring recognizes any of the cases a)/b) or c), the message will stop at that point. This means that the message will only be returned once on the RS232.

However, if none of the units on the NCB recognizes any of the cases a) to c), the message will return to the originator (the unit which received the message on RS232). This unit will re-transmit the message once more on both NCB and RS232. The message is therefore returned a second time on RS232. This time one of the cases a) or c) is sure to be identified by one of the units on the NCB, and the message is removed.

There is however one more special case: If several messages for unused addresses are transmitted with only little delay, one might experience that some messages are returned several times, as the store/compare/remove function in case c) can only handle a single message at the time. We therefore recommend that the user avoid sending messages to unused addresses.

9.3 RS232

The RS-232 port is used for external control of Triton units. The RS-232 port allows the customer to control the equipment via the Triton Router Control System PC program or self-defined customized solutions.

Connector for the RS-232 port is a DS9 female.

Pin 2 - Tx.

Pin 3 - Rx

Pin 5 - GND

A standard DCE (Data Communication Equipment) cable can be used for connection between PC and Triton equipment. The connection between the connectors is made one-to-one.

Data-rate is 19200 baud/sec with 8 data-bit, 1 stop-bit, no parity, if nothing else is specified in the user manual of the product.

9.4 NCB

The NCB is used for interconnection between several Triton units. Up to 20 routers and/or control panels can be linked together to form a routing system with many operational features.

The NCB utilises a 5 mA current loop with opto-coupled ports.

Standard connector is a 5pin DIN.

Standard MIDI cables can be used to interconnect several Triton units.

Data-rate is 31.25 Kbps.

1 start-bit, 8 data-bit, no parity, 1 stop-bit. Logical 0 = current ON.

9.5 Commands

9.5.1 Audio crosspoint set

Only for use with Audio routers.

Command for setting of crosspoints:

1001nnnn 0kkk kkkk 0vvv vvvv

- nnnn is the matrix address from 0 up to 15.
- kkk kkkk is the output which shall be controlled.
 - kkk kkkk = output number
 - 0 = output 1
 - 127 = output 128
- vvv vvvv is the input which shall be connected to the chosen output.
 - vvv vvvv = input number

9.5.2 Audio crosspoint set acknowledge

Only for use with Audio routers.

Command for acknowledging setting of crosspoints:

1000nnnn 0kkk kkkk 0vvv vvvv

- nnnn is the matrix address from 0 up to 15.
- kkk kkkk is the output which shall be controlled.
 - kkk kkkk = output number
 - 0 = output 1
 - 127 = output 128
- vvv vvvv is the input which shall be connected to the chosen output.
 - vvv vvvv = input number

9.5.3 Video crosspoint set

Only for use with Video routers.

Command for setting of crosspoints:

1010nnnn 0kkkkkkk 0vvvvvvv

- nnnn is the matrix address from 0 up to 15.
- kkk kkkk is the output which shall be controlled.
 - kkk kkkk = output number
 - 0 = output 1
 - 127 = output 128
- vvv vvvv is the input which shall be connected to the chosen output.
 - vvv vvvv = input number.

9.5.4 Video crosspoint set acknowledge

Only for use with Video routers.

Command for acknowledging setting of crosspoints:

1011nnnn 0kkkkkkk 0vvvvvvv

- nnnn is the matrix address from 0 up to 15.
- kkk kkkk is the output which shall be controlled.
 - kkk kkkk = output number
 - 0 = output 1
 - 127 = output 128
- vvv vvvv is the input which shall be connected to the chosen output.
 - vvv vvvv = input number.

9.5.5 Crosspoint status request

This command is used for status request on Audio and Video routers.

1100nnnn 0xxxxxxx

- nnnn is the matrix address from 0 up to 15.
- xxxxxxx - do not carry any information

The requested router (Audio or Video) will send its crosspoint status on NCB OUT and RS232. The same command format as for crosspoint set is used.