

User's Manual



CrossPoint Matrix Switchers

CrossPoint 84, 88, 124, 128, 168, and 1616 HV and HVA

Precautions

Safety Instructions • English



This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.



This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français



Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).



Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conservier les instructions • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Éviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch



Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.



Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español



Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.



Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de le contourner ni de le désactiver.

Déconnexion de l'alimentation • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluss, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegen gestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Lithium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearla ni eliminarla.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

Quick Start — CrossPoint Matrix Switchers

Installation

Step 1

Mount the switcher in a rack.

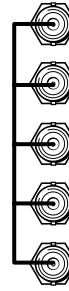
Step 2

Turn off power to the input and output devices, and remove the power cords from them.

Step 3

Cable the switcher for RGBHV, RGBS, RGSB, RsGsBs, component video, S-video, or composite video input and output (3). See page 2-3 in this manual for details.

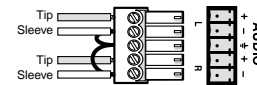
3



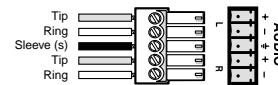
Step 4

Cable the switcher for stereo audio input (HVA models). Each input has a 3.5 mm, 5-pole captive screw connector for balanced or unbalanced stereo audio input (4). Connectors are included with each switcher, but you must supply the audio cable. High impedance is generally over 800 ohms.

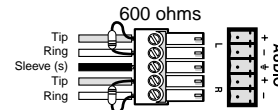
4



Unbalanced Input
(high impedance)



Balanced Input
(high impedance)



Balanced Input
(600 ohms)

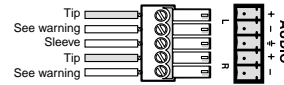
Step 5

Cable the switcher for stereo audio output (HVA models). Each output has a 3.5 mm, 5-pole captive screw connector that outputs the selected unamplified, line level audio. Connect an audio device, such as an audio amplifier or powered speakers (5).

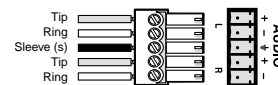
Step 6

Plug the switcher, input devices, and output devices into a grounded AC source, and turn on the input and output devices.

5



Unbalanced Output



Balanced Output

Definitions

The following terms are used throughout this manual:

Tie — An input-to-output connection.

Set of ties — An input **typed** to two or more outputs. (An output can never be **typed** to multiple inputs.)

Configuration — One or more **ties** or **sets of ties**.

Current configuration — The currently active **configuration** (also called **configuration 0**).

Preset — A **configuration** that has been stored.

One **preset** can be assigned to each input button. When a **preset** is retrieved from memory, it becomes the **current configuration**.

Quick Start — CrossPoint Matrix Switchers, cont'd

Front Panel Controls

Input and output buttons and LEDs select and identify inputs and outputs. Input buttons also select presets. On HVA models, the output LEDs also display the audio level of the selected input.

Enter button saves changes when you change the configuration.

Preset button saves a configuration as a preset or recalls a previously-defined preset.

View button selects a view-only mode that prevents inadvertent configuration changes. On HVA models, the View button decrements the audio level of the selected input. The View LED indicates a negative (-) attenuation value.

Esc button cancels selections in progress and resets the front panel LEDs. The Esc button does **not** reset the current configuration, the RGBHV and Audio LEDs, any presets, or any audio gain/attenuation settings. On HVA models, the Esc button increments the audio level of the selected input. The Esc LED indicates a positive (+) gain value.

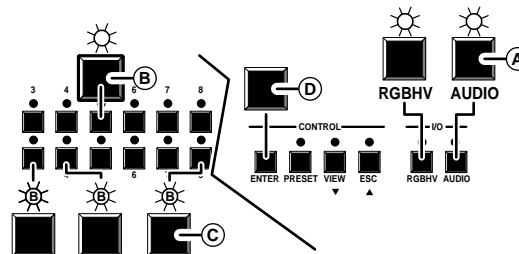
RGBHV and Audio buttons select/deselect video and/or audio. The Audio LED blinks to indicate audio breakaway. The Audio button also selects the audio level/adjust mode.

Input and output label windows hold labels that can be created easily with Extron's label software or with any Brother P-Touch labeler.

LED key: ● = off, ☀ = on, ⚡ = blinking.

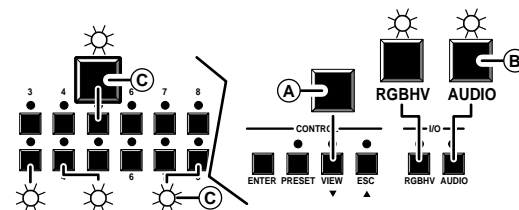
Create a tie

- Press and release the RGBHV and/or Audio button(s) to select audio and/or video.
- Press and release the desired input button.
- Press and release the desired output button(s).
- Press and release the Enter button.



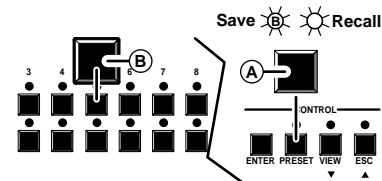
View ties

- Press and release the View button.
- Press and release the RGBHV and/or Audio button(s) to select audio and/or video.
- Press and release the desired input button. The selected input and tied output LEDs light.



Save or recall a preset

- To **save** a preset, press and **hold** the Preset button until the Preset LED begins to blink. To **recall** a preset, press and release the Preset button. The Preset LED turns on steadily.
- Press and release the input button associated with the desired preset number.



View and adjust audio level

- Press and **hold** the Audio button until the Audio LED begins to blink.
- Press and release the desired input button. The level is displayed by the output LEDs, (+) by the Esc LED, and (-) by the View LED.
- Increment and decrement the level by pressing the Esc (▲) and View (▼) buttons.
- Press and release the Audio button to exit.

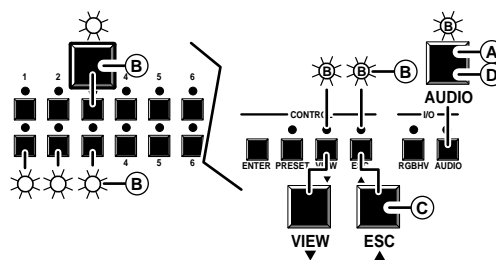


Table of Contents

Chapter 1 • Introduction	1-1
About the CrossPoint Series Matrix Switchers	1-2
Features	1-3
Chapter 2 • Installation	2-1
Rack Mounting the Switcher	2-2
Cabling and Rear Panel Views	2-2
Power connection	2-2
Video input and output connections	2-3
Audio input and output connections (HVA models only)	2-3
RS-232/422 connection	2-4
Additional rear panel views	2-4
Chapter 3 • Operation	3-1
Front Panel Controls and Indicators	3-2
Definitions	3-2
Input buttons, output buttons, and LEDs	3-3
Control buttons and LEDs	3-3
I/O controls	3-4
Front panel I/O label windows	3-4
Front Panel Operations	3-5
Power	3-5
Creating a configuration	3-5
Viewing a configuration	3-8
Using presets	3-10
Viewing and adjusting the audio level (HVA models only)	3-12
Executive mode (front panel security lockout)	3-14
System reset to factory defaults	3-15
Rear Panel Controls	3-15
Worksheets	3-15
Worksheet example 1: Entering system equipment	3-15
Worksheet example 2: Drawing ties	3-16
Worksheet example 3: Test configuration	3-16
Matrix Switchers Configuration Worksheet	3-17
Chapter 4 • Programmer's Guide	4-1
Host-to-Switcher Instructions	4-2
Switcher-Initiated Messages	4-2
Switcher Error Responses	4-3
Using the Command/Response Table	4-3
Command/Response Table	4-4

Table of Contents, cont'd

Chapter 5 • Matrix Software	5-1
Matrix Switcher+ Control Program	5-2
Installing the software	5-2
Using the software	5-2
Overview	5-2
Using emulation mode	5-5
Using the help system	5-5
Button-Label Generator	5-5
Using the software	5-5
Appendix A • Specifications	A-1
Specifications	A-2
Part Numbers	A-4
CrossPoint part numbers	A-4
Optional accessories	A-4
Cables	A-4
Appendix B • Reference Information	B-1
Hardware Upgrades	B-2
Opening the switcher	B-2
Opening the CrossPoint 84, 88, 124, and 128	B-2
Opening the CrossPoint 168 and 1616	B-3
Closing the switcher	B-3
Swapping the serial ports	B-3
Installing a firmware update	B-4
Replacing the AC fuse (CrossPoint 84, 88, 124, and 128 only)	B-6
Button Labels	B-6



CrossPoint Matrix Switchers

Chapter One

Introduction

About the CrossPoint Matrix Switchers

Features

Introduction

About the CrossPoint Series Matrix Switchers

The Extron CrossPoint Series Matrix Switchers are analog RGBHV matrix switchers that distribute any input to any combination of outputs. The matrix switchers can route multiple input/output configurations simultaneously. There are six series available that offer a variety of matrix sizes:

- CrossPoint 84 (eight inputs by four outputs)
- CrossPoint 88 (eight inputs by eight outputs)
- CrossPoint 124 (twelve inputs by four outputs)
- CrossPoint 128 (twelve inputs by eight outputs)
- CrossPoint 168 (sixteen inputs by eight outputs)
- CrossPoint 1616 (sixteen inputs by sixteen outputs)

Each series offers two models: HV for switching RGBHV signals, and HVA models for switching RGBHV and two-channel stereo audio (balanced and unbalanced). All models also switch RGBS, RGsB, RsGsBs, HDTV, component video, S-video, and composite video (figure 1-1). The audio switching can either be linked with the video (audio follow) or independent of the video (audio breakaway). Adjustable audio gain and attenuation compensates for level differences between audio inputs.

The CrossPoint Series are single box solutions to simple 200 MHz (-3dB) routing applications. Each input and output is individually isolated and buffered, and any input(s) can be switched to any one or all outputs with virtually no crosstalk or signal noise between channels.

The CrossPoint 84, 88, 124, and 128 Matrix Switchers are housed in rack-mountable, 3U high, 19" wide metal enclosures. The CrossPoint 168 and 1616 are in a 6U high enclosure. The appropriate rack mounting kit is included with each switcher. Each model has an internal 100VAC to 240VAC, 50/60 Hz, 30 watts (CrossPoint 84, 88, 124, and 128) or 36 watts (CrossPoint 168 and 1616), auto-switchable power supply that provides worldwide power compatibility.

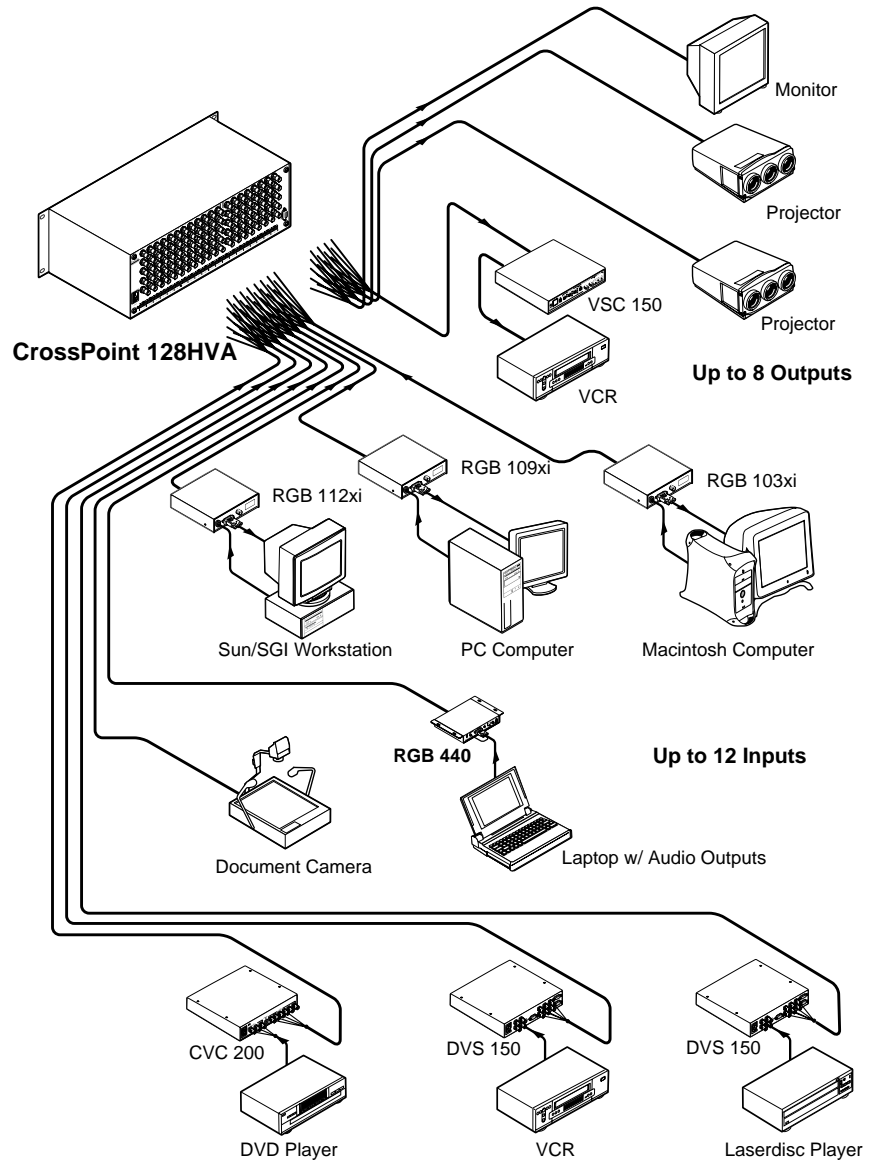


Figure 1-1 — A typical CrossPoint Matrix Switcher application

Features

- Inputs** — These switchers offer 8, 12, or 16 RGBHV, RGBS, RGsB, RsGsBs, HDTV, component video, S-video, or composite video inputs on BNC connectors
- Stereo audio can be balanced or unbalanced, on 3.5 mm, 5-pole captive screw terminals (HVA models)
- Outputs** — 4, 8, or 16 RGBHV, RGBS, RGsB, RsGsBs, HDTV, component video, S-video, or composite video outputs are available on BNC connectors
- Stereo audio, balanced or unbalanced, on 3.5 mm, 5-pole captive screw terminals (HVA models)
- Bandwidth** — Bandwidth is a minimum of 200 MHz (-3dB), fully loaded. This high bandwidth allows Extron's switchers to switch everything from NTSC video to high-resolution computer displays.

Introduction, cont'd

Operational flexibility — Operations such as input/output selection, setting of presets, and adjustment of audio levels can be performed on the front panel or over the RS-232/RS-422 link. The RS-232/RS-422 link allows remote control via a control system.

- **QuickSwitch Front Panel Controller (QS-FPC™)** — The CrossPoint series QS-FPC feature supports touch-of-a-button input and output selection, preset creation and selection, and audio gain and attenuation control.
- **Windows-based control program** — Extron's Windows-based control program provides a versatile range of operational options with its graphical interface and drag-and-drop/point-and-click operation. The Windows-based control program also has an emulation mode that lets you create a switcher configuration file at the home office and then download it for use by the switcher on site.
- **Simple Instruction Set (SIS™)** — The remote control protocol uses Extron's SIS for easy programming and operation.

Audio gain/attenuation — Users can set the level of audio gain or attenuation (-15dB to +9dB) via the RS-232/RS-422 link or from the front panel. Individual input audio levels can be adjusted so there are no noticeable volume differences between sources (figure 1-2).

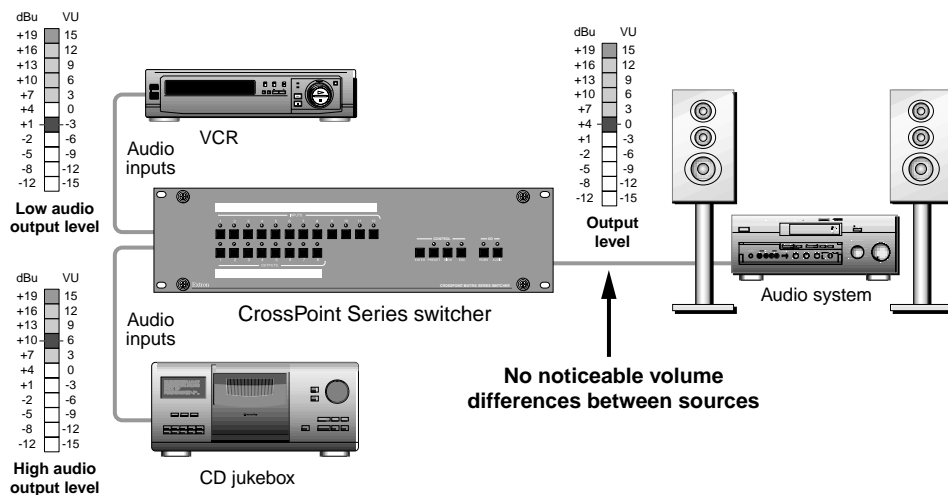


Figure 1-2 — Audio gain and attenuation

Global memory presets — 12 (CrossPoint 84, 88, 124, and 128) or 16 (CrossPoint 168 and 1616) global memory presets are a time-saving feature that lets you set up and store input/output configurations in advance and then recall those configurations when needed with a few simple steps.

Switching — Individually buffered, independent matrix switched outputs with audio follow and audio breakaway on HVA versions.

- **Any input to any or all outputs**
- **Audio follow** — Audio can be switched with the corresponding video input. This feature allows any audio signal to be selected with any video signal simultaneously to one or all outputs in any combination. Audio follow switching can be done via front panel control or under RS-232/RS-422 remote control.
- **Audio breakaway** — Audio can be broken away from its corresponding video signal. Audio breakaway switching can be done via front panel control or under RS-232/RS-422 control.

Remote control — The CrossPoint switchers are remote controllable, using the MKP 1000 master control keypad and any combination of MCP 1000 slave control panels and/or MKP 1000 slave control keypads. The remote control devices are easy to use and provide tactile buttons for quick selection. Each MCP 1000 can be used for one-touch switching for a particular output and selecting global presets. Each MKP 1000 dedicated to an output can be used to select a different input for that output or to select a preset.

Labeling — Extron's label software ships with every Extron matrix switcher. You can create labels to place alongside the front panel input buttons and output buttons, with names, alphanumeric characters, or color bitmaps for easy and intuitive input and output selection. Alternatively, labels can be made with any Brother P-Touch or comparable labeler.

Executive mode (front panel security lockout) — If a CrossPoint Series Switcher is installed in an open area, where operation by unauthorized personnel may be a problem, a security lock-out feature can be implemented. When the front panel is locked, a special button combination is required to unlock the front panel controller before it can be operated.

Rack mount — The switchers are mountable in any conventional 19" wide rack.

Power — The internal 100VAC to 240VAC, 50/60 Hz, 30 watts (CrossPoint 84, 88, 124, and 128) or 36 watts (CrossPoint 168 and 1616), auto-switchable power supply of the CrossPoint Series provides worldwide power compatibility.

Introduction, cont'd



CrossPoint Matrix Switchers

Chapter Two

Installation

Rack Mounting the Switcher

Cabling and Rear Panel Views

Installation

Rack Mounting the Switcher

The CrossPoint 84, 88, 124, and 128 Matrix Switchers are housed in rack-mountable, 3U high, 19" wide metal enclosures. The CrossPoint 168 and 1616 are in 6U high enclosures. The appropriate rack mount kit is included with each switcher. Rack mount the switcher as follows:

1. Insert the switcher into the rack, align the holes in the mounting bracket with those of the rack.
2. Secure the switcher to the rack using the supplied machine screws.

Cabling and Rear Panel Views

All connectors are on the rear panel. Figure 2-1 shows the CrossPoint 128HVA. The CrossPoint 84, 88, and 124 are housed in the same 3U enclosure, but have fewer input and/or output connectors to accommodate the different matrix sizes each provides. Figure 2-2 shows the CrossPoint 1616HVA. The CrossPoint 168 is housed in the same 6U enclosure, but has fewer output connectors to accommodate its 16x8 matrix.

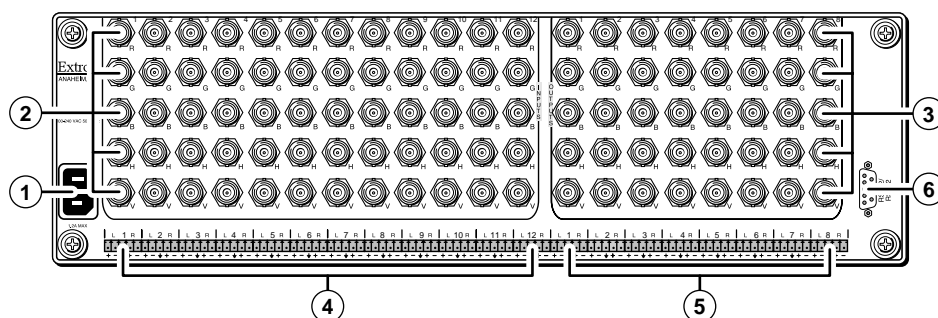


Figure 2-1 — Rear panel connectors, CrossPoint 128HVA

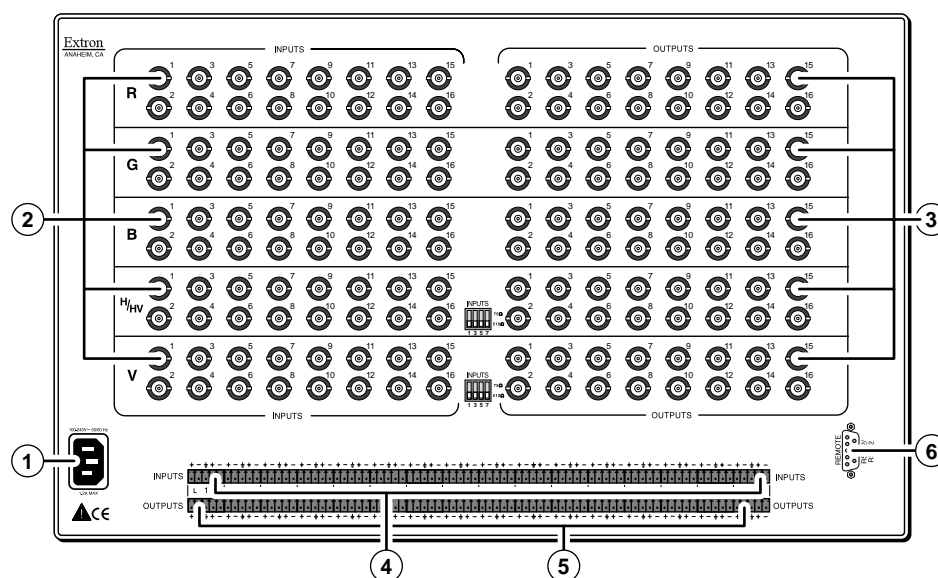


Figure 2-2 — Rear panel connectors, CrossPoint 1616HVA

Power connection

- ① **AC power connector** — Plug a standard IEC power cord into this connector to connect the switcher to a 100 to 240VAC, 50 Hz or 60 Hz power source.

Video input and output connections

NOTE All video input and output connections to the CrossPoint switchers are made with female BNC connectors. Some types of video output devices do not have BNC video output connectors. For these cases, a suitable cable or connector adapter is necessary between the device output connector and the BNC input connector of the CrossPoint.

- ② **RGBHV video inputs** — Connect RGBHV video inputs to these BNC connectors for each input.
- ③ **RGBHV video outputs** — Connect RGBHV video outputs to these BNC connectors for each output.

NOTE The CrossPoint Series switchers can also switch RGBS, RGsB, RsGsBs, component video, S-video, or composite video by using four, three, two, or one BNC. If switching a video format other than RGBHV, ensure that the same video planes (R, G, B, H/HV, and/or V) are used on the switcher output as on the input.

NOTE The CrossPoint Series Matrix Switchers do not alter the video signal in any way. The signal output by the switcher is in the same format as the input.

Audio input and output connections (HVA models only)

WARNING The captive screw connector can easily be inadvertently plugged partially into one receptacle and partially into an adjacent receptacle. This misconnection could damage the audio output circuits. Exercise care to ensure the captive screw connector is plugged into the desired input or output.

- ④ **Connections for balanced and unbalanced audio inputs** — Each input has a 3.5 mm, 5-pole captive screw connector for balanced or unbalanced stereo audio input. Connectors are included with each CrossPoint switcher, but you must supply the audio cable. See figure 2-3 to wire a connector for the appropriate input type and impedance level. High impedance is generally over 800 ohms.

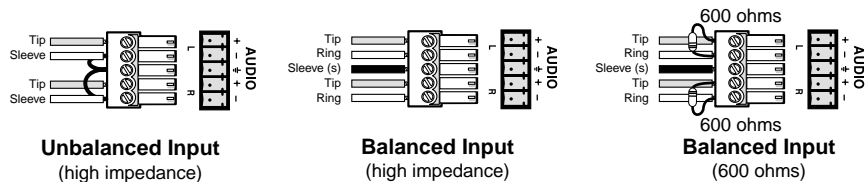
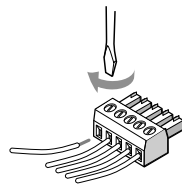


Figure 2-3 — Captive screw connector wiring for inputs

NOTE When making connections for the CrossPoint Series Switcher from existing audio cables, see figure 2-4. A mono audio connector consists of the tip and sleeve. A stereo audio connector consists of the tip, ring and sleeve. The ring, tip, and sleeve wires are also shown on the captive screw audio connector diagrams, figure 2-3 and figure 2-5.

Installation, cont'd

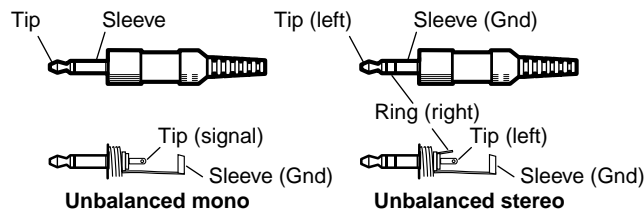


Figure 2-4 — Phono audio connectors

The audio level for each input can be individually set, via the front panel or RS-232/422, to ensure that the level on the output does not vary from input to input. See chapter 3, *Operation*, chapter 4, *Programmer's Guide*, and chapter 5, *Matrix Software* for details.

- ⑤ **Connections for audio outputs** — These 3.5 mm, 5-pole captive screw connectors output the selected unamplified, line level audio. Connect audio devices, such as an audio amplifier or powered speakers. See figure 2-5 to properly wire an output connector.

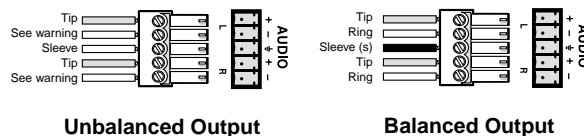


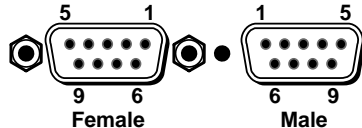
Figure 2-5 — Captive screw connector wiring for audio output

WARNING Connect the sleeve to ground (Gnd). Connecting the sleeve to a negative (-) terminal will damage the audio output circuits.

By default, the audio output follows the video switch. Audio breakaway, commanded via the front panel, under RS-232/422 control, or Windows-based control program, allows you to select from any one of the audio input sources. See chapter 3, *Operation*, chapter 4, *Programmer's Guide*, and chapter 5, *Matrix Software* for details.

RS-232/422 connection

- ⑥ **Remote/RS-232/422 port** — Connect a host device, such as a computer or touch panel control, to the CrossPoint via this 9-pin D connector for serial RS-232/422 control.



If desired, attach an MCP 1000 remote control panel master unit to the switcher's RS-232/422 connector. You can also attach an MKP 1000 remote keypad or MCP 1000 slave unit to the MCP 1000 master unit. Refer to the *MCP 1000 Remote Control Panel User's Manual* and the *MKP 1000 User's Manual* for details.

See chapter 4, *Programmer's Guide*, for definitions of the SIS commands and chapter 5, *Matrix Software* for details on how to install and use the control software.

NOTE The CrossPoint Series Matrix Switchers are factory configured for RS-232 control. To use the switcher under RS-422 control, an internal cable must be moved. See Appendix B for the procedure for shifting the cable.

Additional rear panel views

The following figures show the rear panels of all CrossPoint switchers, except for the CrossPoint 128HVA, which is shown in figure 2-1, and the CrossPoint 1616HVA, which is shown in figure 2-2.

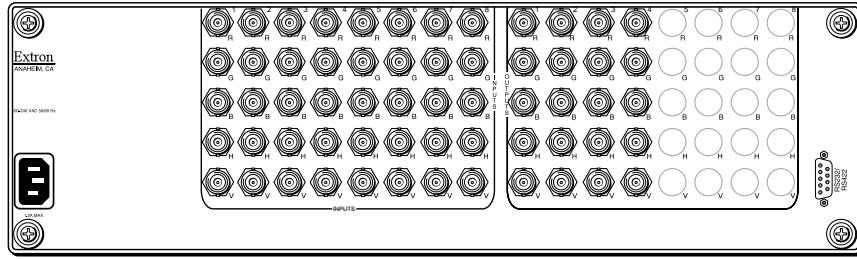


Figure 2-6 — Rear panel view, CrossPoint 84HV

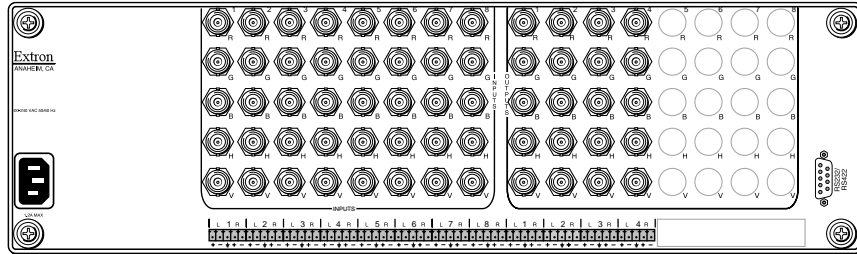


Figure 2-7 — Rear panel view, CrossPoint 84HVA

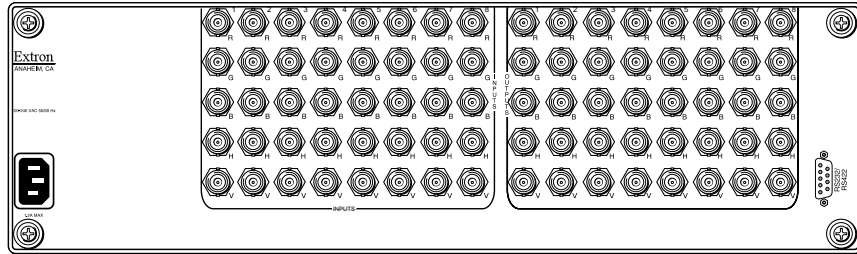


Figure 2-8 — Rear panel view, CrossPoint 88HV

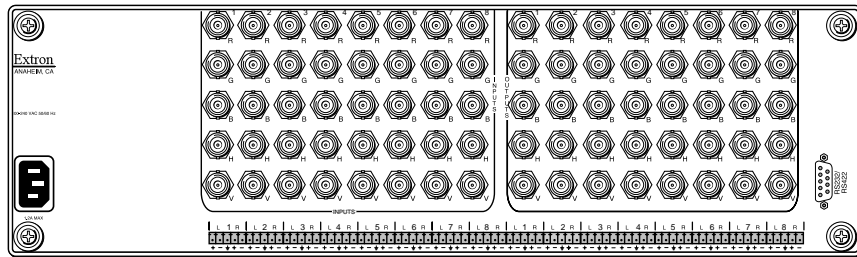


Figure 2-9 — Rear panel view, CrossPoint 88HVA

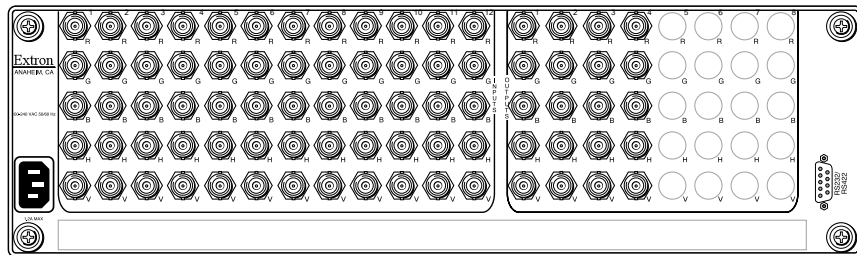


Figure 2-10 — Rear panel view, CrossPoint 124HV

Installation, cont'd

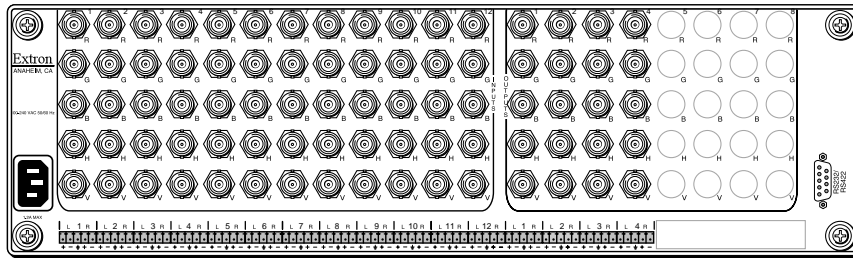


Figure 2-11 — Rear panel view, CrossPoint 124HVA

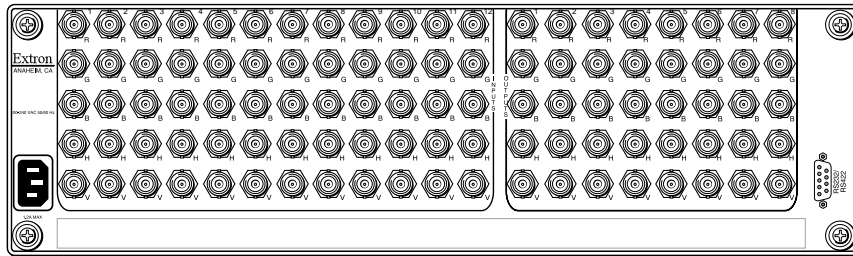


Figure 2-12 — Rear panel view, CrossPoint 128HV

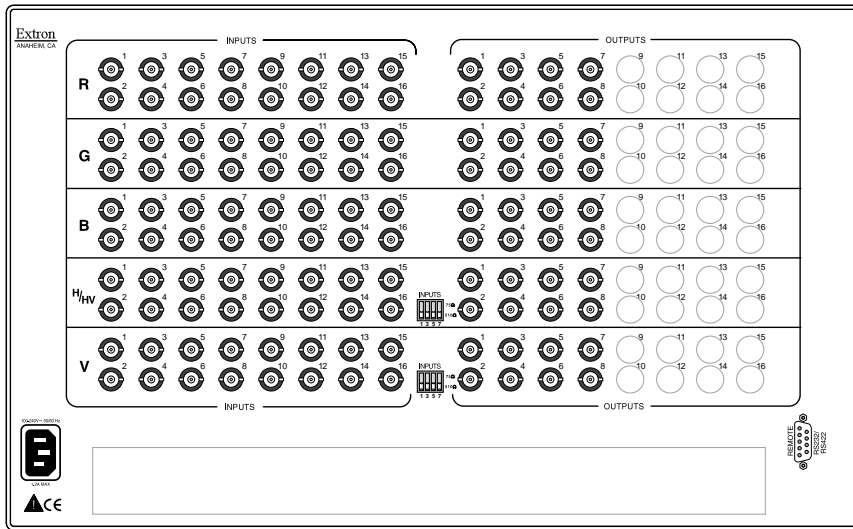


Figure 2-13 — Rear panel view, CrossPoint 168HV

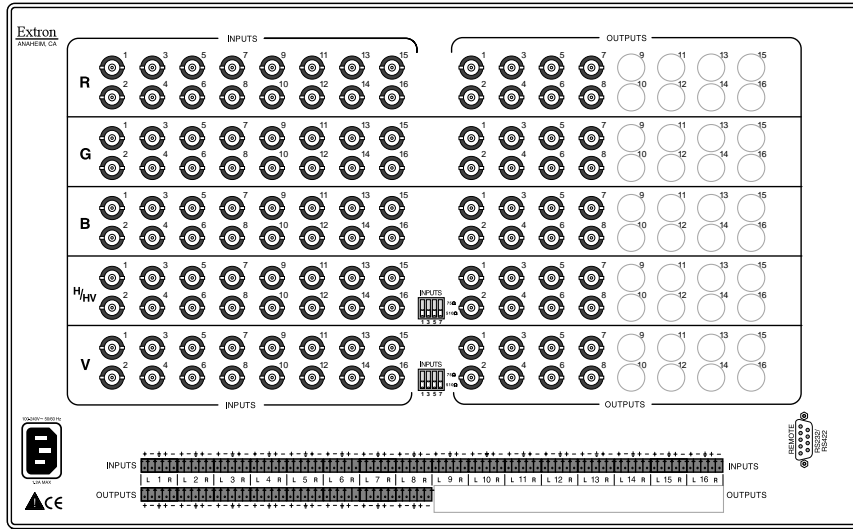


Figure 2-14 — Rear panel view, CrossPoint 168HVA

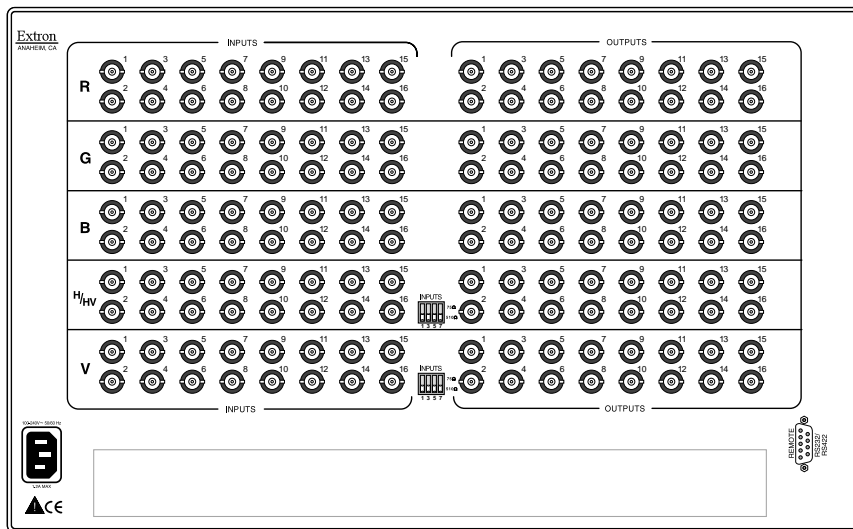


Figure 2-15 — Rear panel view, CrossPoint 1616HV

Installation, cont'd



CrossPoint Matrix Switchers

Chapter Three

Operation

Front Panel Controls and Indicators

Front Panel Operations

Rear Panel Controls

Worksheets

Operation

Front Panel Controls and Indicators

The front panel controls (figure 3-1 and figure 3-2) are grouped into two sets. The input and output buttons and LED indicators are grouped on the left side of the control panel. The control buttons and input/output (I/O) selection buttons and indicators are grouped on the right side of the panel.

NOTE While the number of inputs and outputs varies depending on the size of the matrix, there are only two front panel arrangements. The CrossPoint 84, 88, 124, and 128 have 12 input buttons and 8 output buttons (figure 3-1). The CrossPoint 168 and 1616 have 16 input buttons and 16 output buttons (figure 3-2).

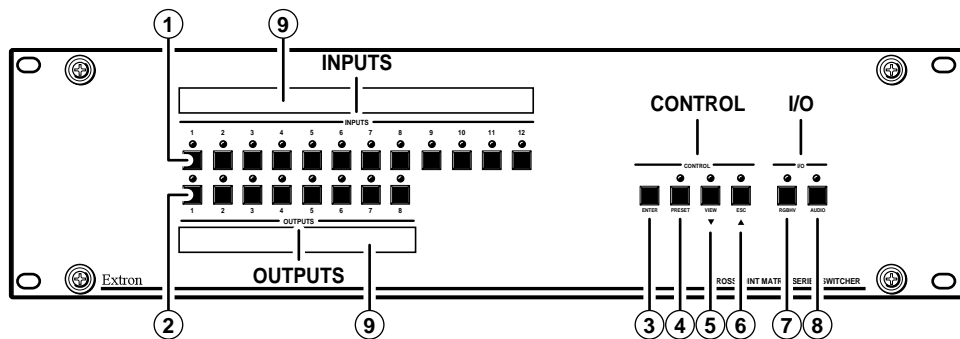


Figure 3-1 — Front panel, CrossPoint 128 HVA

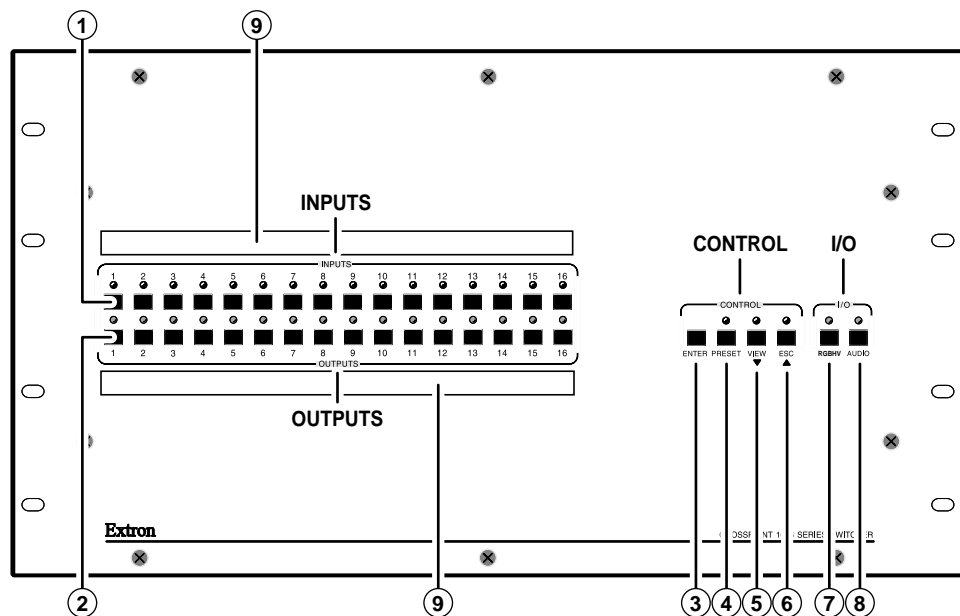


Figure 3-2 — Front Panel, CrossPoint 1616 HVA

Definitions

The following terms apply to Extron Matrix Switchers, and are used throughout this manual:

Tie — An input-to-output connection.

Set of ties — An input **typed** to two or more outputs. (An output can never be **typed** to more than one input.)

Configuration — May consist of one **tie** or one or more **sets of ties**.

Current configuration — The **configuration** that is currently being used (also called **configuration 0**).

Global memory preset — A **configuration** that has been stored. Up to twelve **global memory presets** (CrossPoint 84, 88, 124, and 128) or sixteen **global memory presets** (CrossPoint 168 and 1616) can be stored in memory. The input buttons select the desired **preset** memory location to load or retrieve a **preset**. When a **preset** is retrieved from memory, it becomes the **current configuration**. One **preset** can be assigned to each input button.

Input buttons, output buttons, and LEDs

NOTE *If the switcher has fewer inputs and outputs than input and output buttons and LEDs, only the applicable buttons and LEDs perform the function of selecting and identifying an input or output.*

- ① **Input 1 through 12 (16) buttons and LEDs** — The input buttons have two independent functions: to select an input and to select a preset. The input LEDs identify selected inputs. A more detailed explanation of the two functions is included in *Front Panel Operations* beginning on page 3-5.
- ② **Output 1 through 8 (16) buttons and LEDs** — The output buttons and LEDs select and identify outputs. On HVA models, the output LEDs also display the user-adjustable audio level of the selected input. A more detailed explanation of audio level adjustment is included in *Viewing and adjusting the audio level (HVA models only)* on page 3-12.

Control buttons and LEDs

- ③ **Enter button** — The Enter button saves changes when you set up a new configuration. To create a simple configuration, specify video, audio, or both (see controls (7) and (8)); press the desired input button (1); press the desired output button(s) (2); and press the Enter button.
- ④ **Preset button and LED** — The Preset button saves a configuration as a preset or recalls and makes current a previously defined preset. The Preset LED indicates save mode when it is blinking and recall mode when it lights steadily.
- ⑤ **View button and LED** — The View button selects a view-only mode that allows the display of the current CrossPoint configurations. The view-only mode helps prevent changing configurations by accident. The View LED indicates that the CrossPoint is in view-only mode.

In view-only mode, pressing any input button (1) or output (2) button lights the LEDs for the input and all outputs that are a part of that set of ties. Pressing the button for any unassigned output lights only the output LEDs for all of the unassigned outputs. No input LED is lit.

As a secondary function on HVA models, the View button decrements the audio level of the selected input. In audio adjustment mode, the View LED indicates a negative (-) attenuation value. A more detailed explanation of audio level adjustment is included in *Viewing and adjusting the audio level (HVA models only)* on page 3-12.

- ⑥ **Esc button and LED** — The Esc button cancels operations or selections in progress and resets the front panel LEDs. The Esc button does **not** reset the current configuration, the RGBHV and Audio LEDs, any presets, or any audio gain/attenuation settings. The Esc LED lights for two seconds after the Esc button is pressed and released to indicate the escape function.

As a secondary function on HVA models, the Esc button increments the audio level of the selected input. In audio adjust mode, the Esc LED indicates a

Operation, cont'd

positive (+) gain value. A more detailed explanation of audio level adjustment is included in *Viewing and adjusting the audio level (HVA models only)* on page 3-12.

I/O controls

When creating or viewing a configuration, you must specify whether the configuration applies to video, audio, or both. This is done with the RGBHV (7) and Audio (8) buttons.

NOTE Although present, the Audio button has no function on HV models.

- ⑦ **RGBHV button and LED** — The RGBHV button selects and deselects video for a configuration being created or viewed. The RGBHV LED lights to indicate that video is available for configuration or viewing.
- ⑧ **Audio button and LED** — The Audio button selects and deselects audio for a configuration that is being created or viewed. The Audio LED lights to indicate that the audio configuration follows the video configuration. The Audio LED blinks to indicate that the audio configuration is broken away from the video configuration.

As a secondary function, the Audio button selects the audio level display/adjust mode. Press and hold the Audio button until the Audio LED begins to blink. If the RGBHV LED was lit, it turns off. Select an input. The current audio level setting for the selected input is displayed in the output LEDs. The audio level for the selected input can be incremented and decremented by pressing the View (5) and Esc (6) buttons. A more detailed explanation of audio level adjustment is included in *Viewing and adjusting the audio level (HVA models only)* on page 3-12.

Front panel I/O label windows

- ⑨ **Input and output label windows** — These translucent panels can be removed and replaced to insert labels behind the panels. To remove a panel, insert the Phillips-head end of an Extron tweaker or small Phillips-head screwdriver into the hole in one end of the panel, and gently slide the tab on the edge of the panel out of the recess in the switcher housing.

Input and output labels can be created easily with Extron's button label generator software, which ships with every Extron Matrix Switcher, or with any Brother P-Touch labeler. Each input and output can be labeled with names, alphanumeric characters, or even color bitmaps for easy and intuitive input and output selection (figure 3-3). See chapter 5, *Matrix Software*, for details on using the label software.

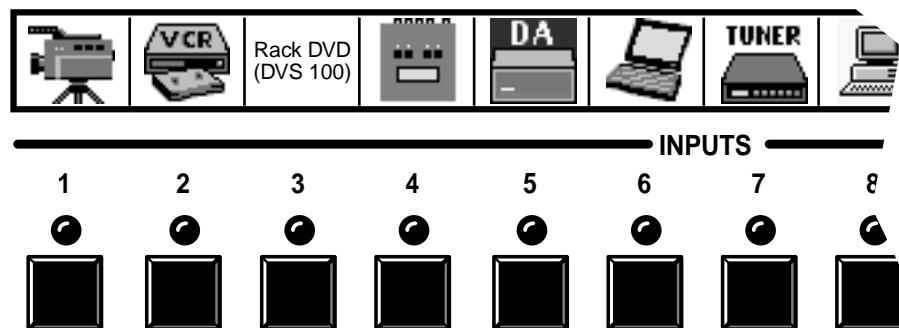


Figure 3-3 — Sample label

Front Panel Operations

The following paragraphs detail the power-up process and then provide sample procedures for creating ties, sets of ties, and configurations; changing a configuration; viewing ties, sets of ties, and configurations; saving a preset; recalling a preset; and viewing and adjusting the audio level.

Power

On all models, power is automatically applied when the power cord is connected to an AC source. When AC power is applied, the switcher performs a self-test that blinks the front panel LEDs during the test. An error-free power up self-test sequence leaves the RGBHV and/or the Audio LED(s) on, depending on the model, and all other LEDs off.

The current configuration and all presets are saved in non-volatile memory. When power is applied, the last current configuration is retrieved. The previous presets remain intact.

If an error occurs during the self-test, the switcher locks up and will not operate. If your switcher locks up on power-up, call the Extron S³ Sales & Technical Support Hotline.

Creating a configuration

The current configuration can be changed using the front panel buttons. To change the current configuration, do the following:

1. Press the Esc button to clear any input LEDs, output LEDs, or control LEDs that may be on.
2. Select to configure video, audio, or both by pressing the RGBHV and/or Audio buttons.
3. Select the desired input and output(s) by pressing the input and output buttons.
4. Press and release the Enter button.
5. Repeat steps 1 through 4 to create additional ties until the desired configuration is complete.

NOTE

1. *Only one video input and one audio input can be tied to an output.*
2. *If a tie is made between an input and an output, and the selected output was previously tied to another input, the older tie is broken in favor of the newer tie.*
3. *To indicate current ties, output LEDs light when an input is selected. To clear unwanted outputs press and release the associated output buttons.*
4. *If, when configuring video and audio ties, the Audio LED blinks and the RGBHV LED is on after selecting an input or output, the LEDs indicate audio breakaway, meaning that the audio ties are not the same as the video ties for that input.*
5. *If an input with no tie is selected, only that input's LED lights.*
6. *When the RGBHV and Audio LEDs are on, if an input with an audio tie but no video tie is selected, the input's LED lights and the Audio LED blinks.*
7. *As each output is selected, the associated output LED blinks to indicate a tentative tie. LEDs for output(s) that were already tied to the input light steadily. Outputs that are already tied can be left on, along with new*

Operation, cont'd

blinking selections, or toggled off by pressing the associated output button.

Example 1: Create a set of video and audio ties

See figure 3-4 and the following steps for an example in which input 5 is tied to outputs 3, 4, and 8.

NOTE This example assumes that there are no ties in the current configuration.

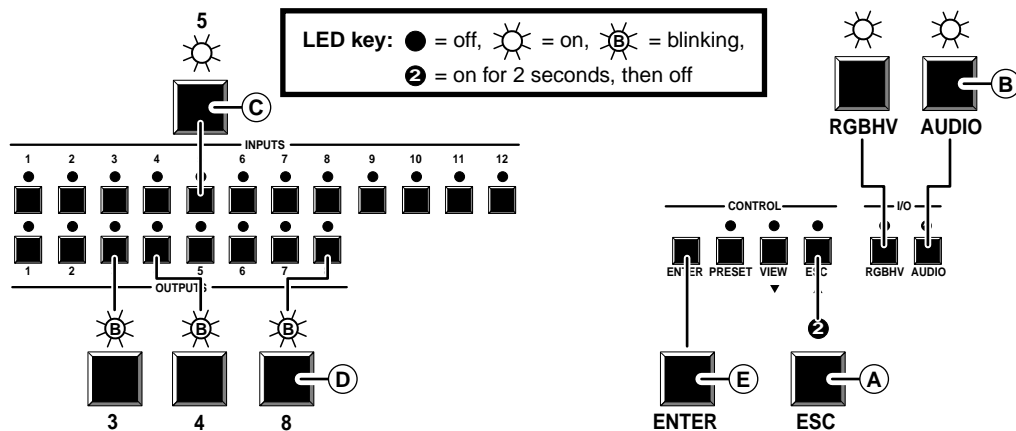


Figure 3-4 — Example 1: Creating a tie

- (A) Press and release the Esc button. The Esc LED turns on for approximately 2 seconds and turns off.
- (B) If necessary to select video and audio for the tie, press and release the RGBHV and Audio buttons until the RGBHV and Audio LEDs light.
- (C) Press and release the input 5 button. The input 5 LED lights.
- (D) Press and release the output 3, output 4, and output 8 buttons. The output 3, output 4, and output 8 LEDs blink to indicate a tentative tie.

NOTE The entire set of ties can be aborted at this point by pressing and releasing the Esc button. The Esc LED turns on for approximately 2 seconds and turns off.

- (E) Press and release the Enter button. The input and output LEDs turn off. The current configuration is now defined as video and audio input 5 tied to video and audio output 3, output 4, and output 8.

Example 2: Add a tie to a set of video and audio ties

See figure 3-5 and the following steps for an example in which a new video tie is added to the current configuration.

- (A) Press and release the Esc button. The Esc LED turns on for approximately 2 seconds and turns off.
- (B) If it is necessary to select video-only for the tie, press and release the RGBHV and Audio buttons until the RGBHV LED lights and the Audio LED is off.
- (C) Press and release the input 5 button. The input 5 LED lights. If the steps in Example 1 have been completed, the output 3, output 4, and output 8 LEDs light to indicate ties created in Example 1.
- (D) Press and release the output 1 button. The output 1 LED blinks to indicate a tentative tie.

- Press and release the Enter button. The input and output LEDs turn off. The current configuration is now defined as video input 5 tied to video output 1, output 3, output 4, and output 8; and audio input 5 tied to audio output 3, output 4, and output 8.

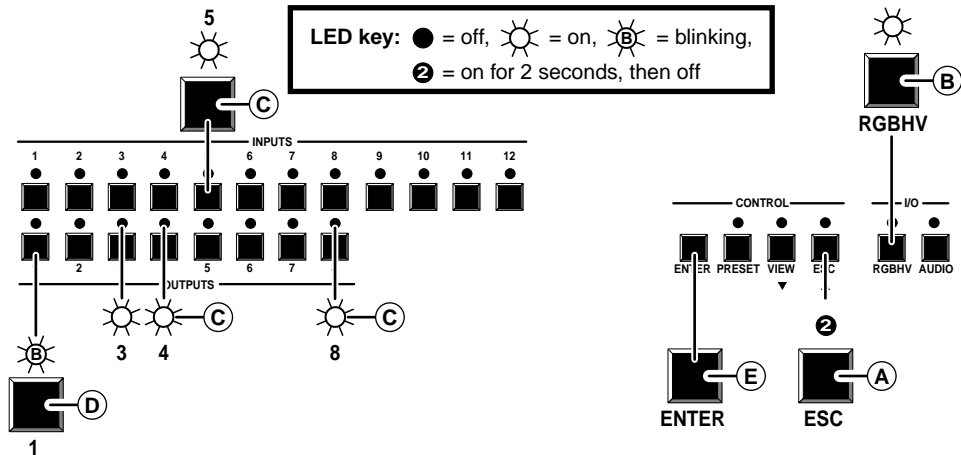


Figure 3-5 — Example 2: Adding a video tie

Example 3: Remove a tie from a set of video and audio ties

See figure 3-6 and the following steps for an example in which an existing audio tie is removed from the current configuration.

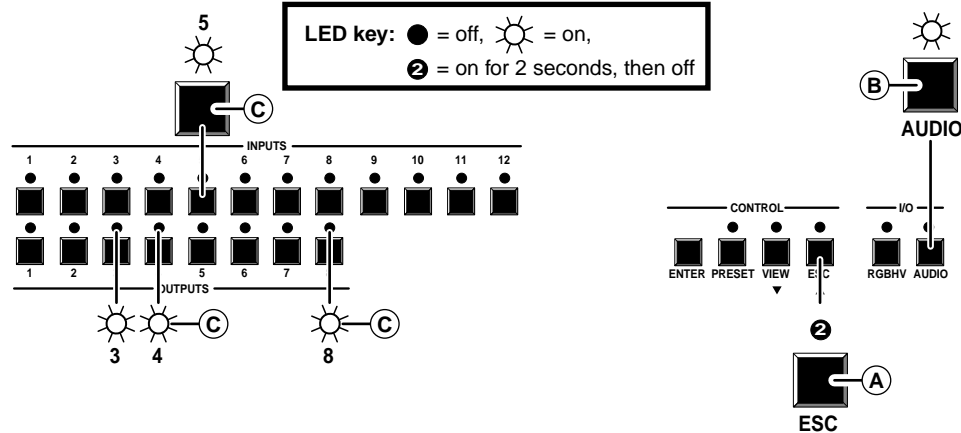


Figure 3-6 — Example 3: Selecting audio, selecting input 5

- Press and release the Esc button. The Esc LED turns on for approximately 2 seconds and turns off.
- If necessary to select audio-only for the tie, press and release the RGBHV and Audio buttons until the RGBHV LED is off and the Audio LED lights.
- Press and release the input 5 button. The input 5 LED lights. If the steps in Example 1 have been completed, the output 3, output 4, and output 8 LEDs light to indicate ties created in Example 1.

NOTE The output 1 LED does not light even if the steps in Example 2 were completed because Example 2 added a video tie only.

- Press and release the output 4 button (figure 3-7). The output 4 LED turns off, while the output 3 and output 8 LEDs remain lit.

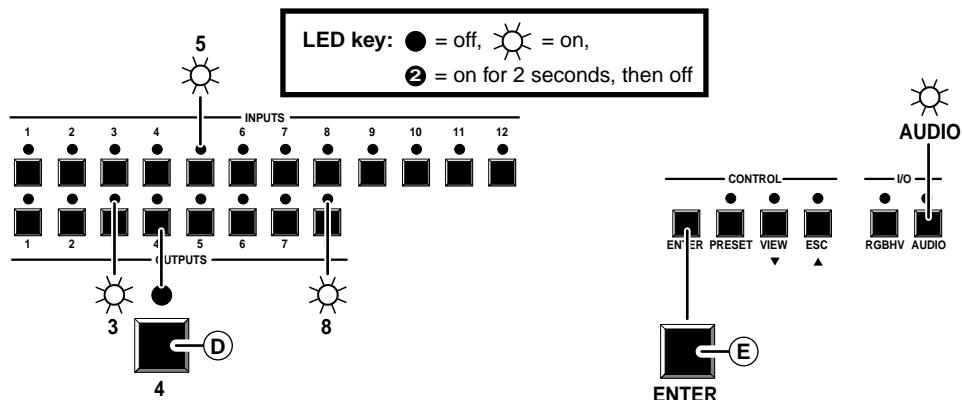


Figure 3-7 — Example 3d: Removing an audio tie

- (E) Press and release the Enter button. The input and output LEDs turn off. The current configuration is now defined as video input 5 tied to video output 1, output 3, output 4, and output 8; and audio input 5 tied to audio output 3 and output 8.

Viewing a configuration

The current configuration can be viewed using the front panel buttons. The view-only mode prevents inadvertent changes to the current configuration.

To view the current configuration, do the following:

1. Press the Esc button to clear any input LEDs, output LEDs, or control LEDs that may be on.
2. Press and release the View button.
3. Select video, audio, or both to view by pressing the RGBHV and Audio buttons.
4. Select the desired input or output(s) for which ties need to be viewed by pressing the input and output buttons.

- NOTE**
1. To see all ties of the current configuration, press and release each input and output button, one at a time, with the RGBHV and Audio LEDs on.
 2. In view-only mode, you can view video and audio, video-only, or audio-only ties. Pressing and releasing the RGBHV and Audio buttons toggles each on and off.
 3. If, when you view video and audio ties, the Audio LED blinks and the RGBHV LED is on after selecting an input or output, the LEDs indicate that the audio ties are not the same as the video ties for that input (audio breakaway is active). Toggle the RGBHV LED off by pressing and releasing the RGBHV button.
 4. When you enter view-only mode, the output LEDs turn on for all outputs without ties. Likewise, when an output button is pushed for which there are no ties, the output LEDs turn on for all outputs without ties. The blinking Audio LED indicates audio breakaway for one or more of those outputs.

Example 4: View video and audio, audio-only, and video-only ties

See figure 3-8, figure 3-9, figure 3-10 and figure 3-10 and the following steps for an example of viewing the video and audio, audio-only, and video-only ties in the current configuration.

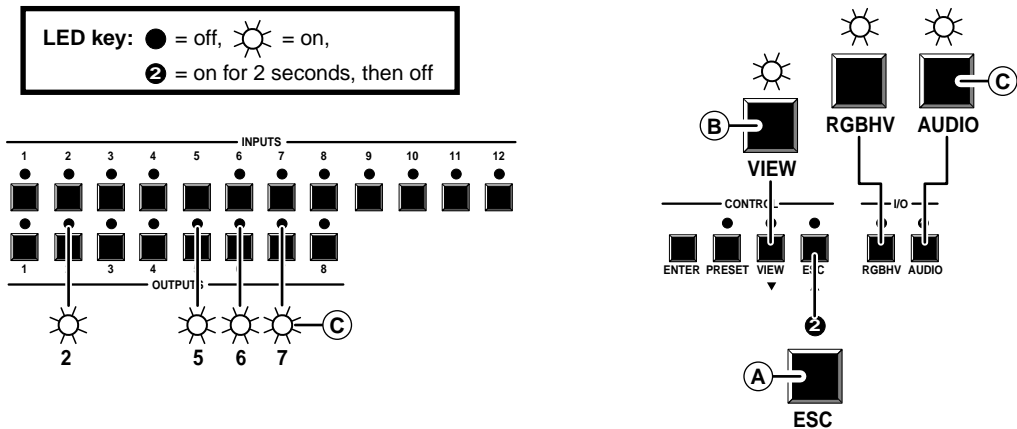


Figure 3-8 — Example 4: Viewing the current configuration, no input selected

NOTE Example 4 shows the process of viewing the current configuration after the steps in Examples 1, 2, and 3 have been performed.

- (A) Press and release the Esc button. The Esc LED turns on for approximately 2 seconds and turns off.
- (B) Press and release the View button to enter view-only mode. The View LED lights.
- (C) If necessary to select both video and audio for viewing, press and release the RGBHV and Audio buttons until the RGBHV LED and Audio LED light. With no input LED selected, all output LEDs that have no established ties light.
- (D) Press and release the input 5 button (figure 3-9). The input 5 LED lights.

If ties are established for input 5, all output LEDs toggle; outputs with no ties turn off and the LEDs associated with all outputs tied to input 5 (audio, video, or audio and video ties) light. If no ties are established for input 5, all output LEDs turn off.

If audio is broken away, the Audio LED blinks.

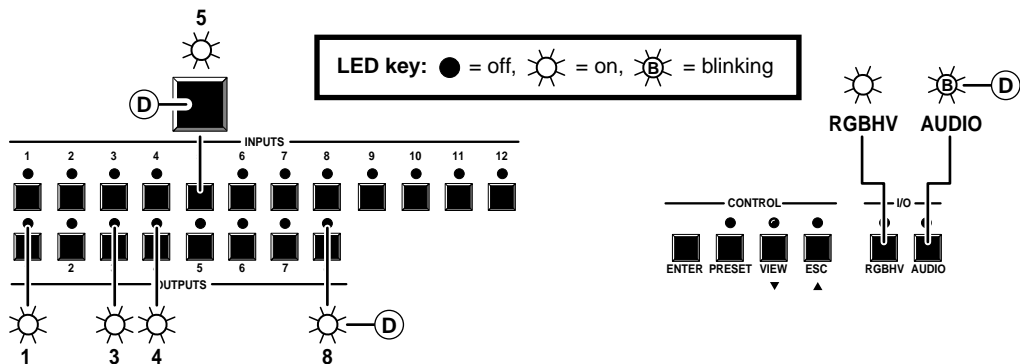


Figure 3-9 — Example 4d: Viewing the current configuration, video and audio

NOTE A set of ties can also be viewed by selecting a tied output. To demonstrate this, note the number of a lit output LED and press and release the output button for an unlit (untied) output LED. Observe that all of the untied outputs light.

Operation, cont'd

Then press the output button for the output LED noted previously and observe that the selected output LED, the tied input LED (input 5), and the output LEDs light for all of the outputs that are tied to the input.

- (E) Press and release the RGBHV button to toggle the Video LED off (figure 3-10). If audio is broken away, the Audio LED stops blinking and lights.

If audio ties are established for input 5, the output LEDs for all audio outputs tied to input 5 light. If no ties are established for input 5, all output LEDs turn off.

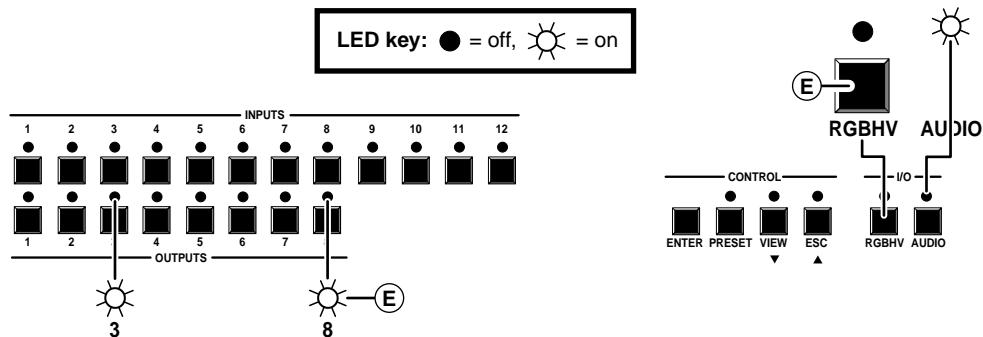


Figure 3-10 — Example 4e: Viewing the current configuration, audio-only

- (F) Press and release the RGBHV and Audio buttons to toggle the Video LED on and the Audio LED off (figure 3-11).

If video ties are established for input 5, the output LEDs for all video outputs tied to input 5 light. If no ties are established for input 5, all output LEDs turn off.

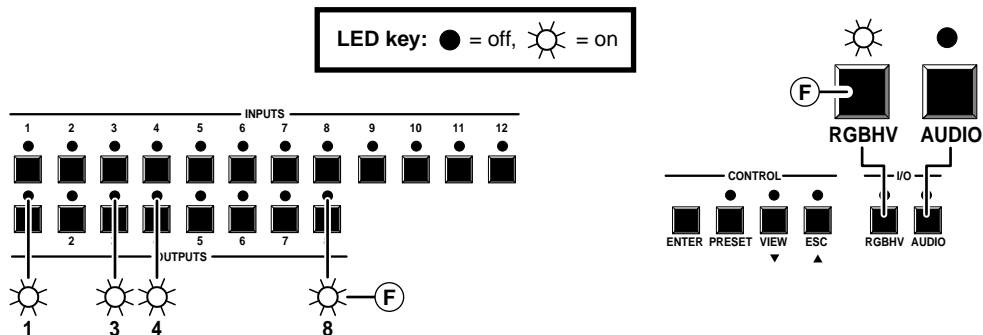


Figure 3-11 — Example 4f: Viewing the current configuration, video-only

Using presets

The current configuration (configuration 0) can be saved as a preset in any one of 12 preset memory addresses (CrossPoint 84, 88, 124, and 128) or 16 preset memory addresses (CrossPoint 168 and 1616). Each CrossPoint switcher has as many presets as input buttons.

- NOTE**
1. Only the audio and video ties are stored and recalled; audio gain settings are not saved, and do not change when a preset is recalled.
 2. Presets cannot be viewed from the front panel unless recalled as the current configuration. Presets can be viewed using Extron's Windows-based control program, see chapter 5, Matrix Software, for more details.

3. The current configuration and all presets are stored in non-volatile memory. When power is removed and restored, the current configuration is still active and all presets are retained.
4. When a preset is recalled, it replaces the current configuration, which is lost unless it is also stored as a preset. The recalled preset overwrites all of the current configuration ties in favor of the preset configuration ties.

Example 5: Save a preset

See figure 3-12 and the following steps for an example of saving the current configuration as a preset.

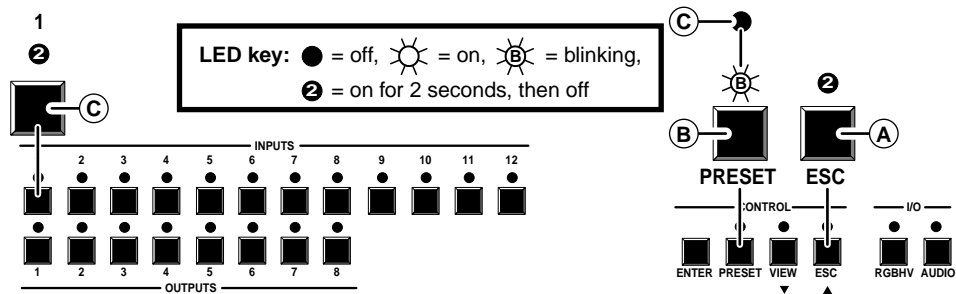


Figure 3-12 — Example 5: Saving the current configuration as preset 1

- (A) Press and release the Esc button. The Esc LED turns on for approximately 2 seconds and turns off.
- (B) Press and **hold** the Preset button for approximately 2 seconds until the Preset LED begins to blink, then release the Preset button.
- (C) Press and release the input 1 button. The input 1 LED turns on for approximately 2 seconds and turns off. The Preset LED turns off.

Example 6: Recall a preset

See figure 3-13 and the following steps for an example of recalling a preset to become the current configuration.

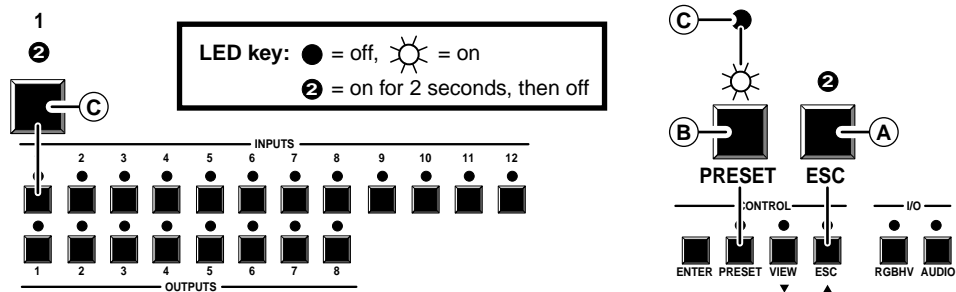


Figure 3-13 — Example 6: Recalling preset 1

- (A) Press and release the Esc button. The Esc LED turns on for approximately 2 seconds and turns off.
- (B) Press and release the Preset button. The Preset LED lights.
- (C) Press and release the input 1 button. The input 1 LED turns on for approximately 2 seconds and turns off. The Preset LED turns off. The configuration stored in memory location 1 is now the current configuration and can be viewed in the view-only mode (Example 4).

Operation, cont'd

Viewing and adjusting the audio level (HVA models only)

On HVA models, the audio level of each input can be displayed and adjusted through a range of -15dB to +9dB to ensure that there is no noticeable volume difference among sources. The audio level can be adjusted from the front panel or by using Extron's Windows-based control program.

1. Press and **hold** the Audio button until the Audio LED begins to blink, then release the Audio button.
2. Press and release an input button to select an input. The audio level for the selected input is displayed in the output LEDs and the polarity (+ or -) is displayed in the View or Esc LEDs.
3. Press and release the Esc (▲) and View (▼) buttons to increase and decrease the audio level.
4. Press and release the Audio button to exit the audio display and adjust mode. The Audio LED stops blinking and turns off.

- NOTE**
1. There is one audio level setting per input. The audio level setting is shared by the left and right audio inputs.
 2. The audio level settings are stored in non-volatile memory. When power is removed and restored, the audio level settings are retained.

Example 7: View and adjust an audio level

See figure 3-14, figure 3-16, and the following steps for an example of viewing and adjusting the audio level. Audio gain and attenuation is displayed differently on the CrossPoint 168 and 1616, but the steps for displaying the value are the same. For this reason, figure 3-15 and figure 3-17 show the indications displayed on the CrossPoint 168 and 1616 without duplicating all of the actions shown in figure 3-14 and figure 3-16.

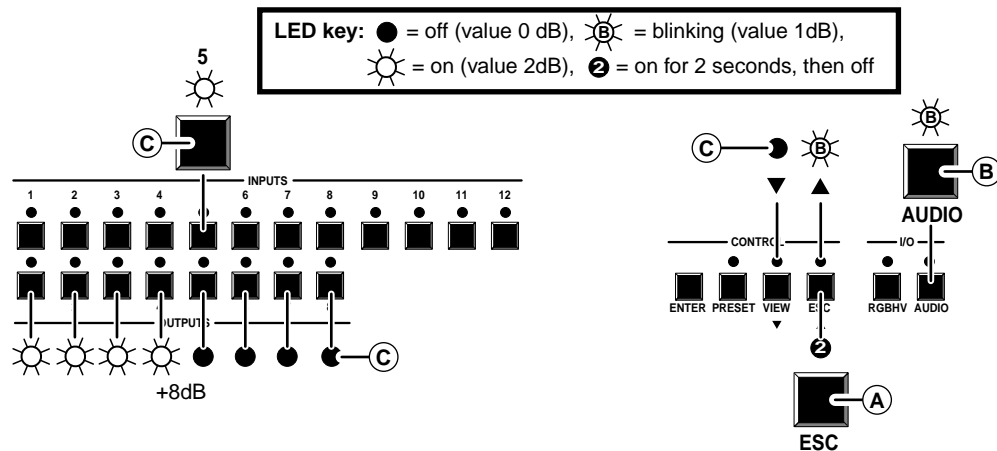


Figure 3-14 — Example 7: Viewing the audio level, CrossPoint 84, 88, 124, and 128

- (A) Press and release the Esc button. The Esc LED turns on for approximately 2 seconds and turns off.
- (B) Press and **hold** the Audio button for approximately 2 seconds until the Audio LED begins to blink, then release the Audio button.
- (C) Press and release the input 5 button. The input 5 LED lights. The audio level for the selected input is displayed in the output LEDs. The polarity is indicated by either the Esc (▲) or View (▼) LED blinking.

On the CrossPoint 84, 88, 124, and 128, each output LED indicates 1dB when blinking and 2dB when lit.

On the CrossPoint 168 and 1616, each output LED indicates 1dB when lit.

The blinking Esc (▲) LED indicates a positive (gain) level. The blinking View (▼) LED indicates a negative (attenuation) level.

Figure 3-14 and figure 3-15 show an audio level of +8dB displayed in the output LEDs on the two different CrossPoint front panels.

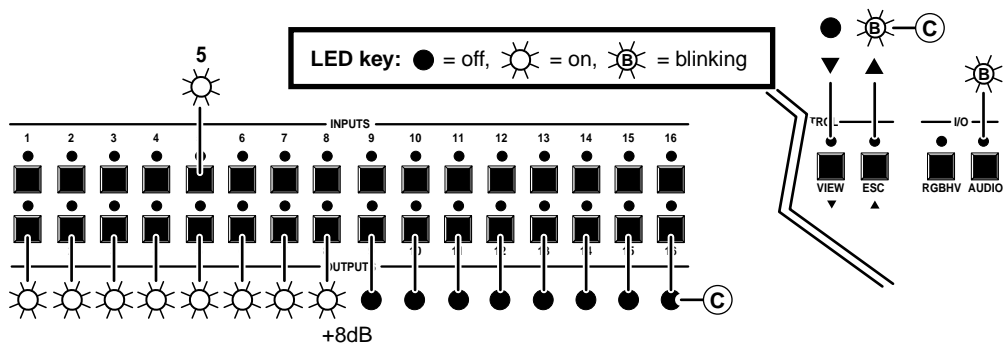
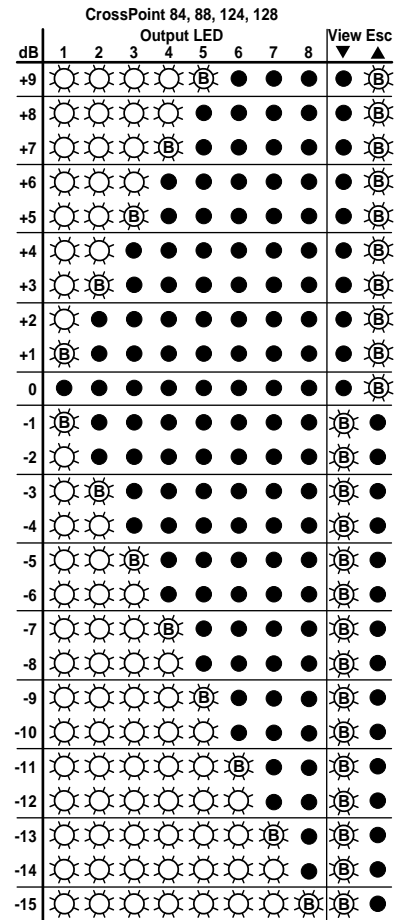


Figure 3-15 — +8dB displayed, CrossPoint 168 and 1616

- (D) Press and release the View (▼) button once to decrease the audio level displayed in the output LEDs by 1dB. Press and release the View (▼) button several more times to decrease the audio level displayed in the output LEDs by an additional 1dB per button push. Note the output LED, View LED, and Esc LED changes that occur each time the View (▼) button is pressed and released. Figure 3-16 and figure 3-17 show the result of pressing the View (▼) button a total of 9 times. Both figures show an audio level of -1dB. Note that the Esc (▲) LED has turned off and that the View (▼) LED is blinking to indicate a negative level.

Operation, cont'd

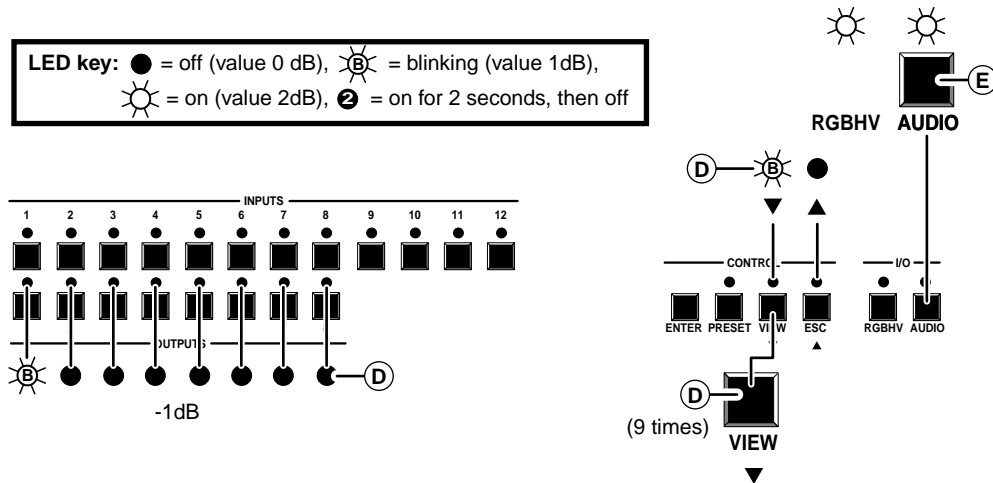


Figure 3-16 — Example 7d: Adjusting the audio level, CrossPoint 84, 88, 124, and 128

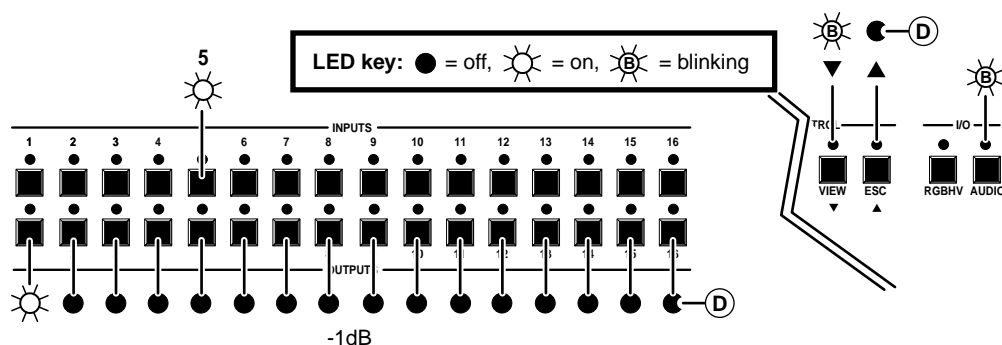


Figure 3-17 — -1dB displayed, CrossPoint 168 and CrossPoint 1616

NOTE If another input button is pressed and released, the level value for the current input is saved and level value for the newly selected input is displayed.

(E) Press and release the Audio button. The Audio LED stops blinking and the View (▼) LED (if lit), the Esc (▲) LED (if lit), the selected input LED, and all output LEDs turn off.

NOTE Both the RGBHV and Audio LEDs light.

Executive mode (front panel security lockout)

The executive mode limits the operation of the CrossPoint switcher from the front panel. When the switcher is in executive mode, all of the front panel functions are disabled except for the view-only mode functions. See *Viewing a configuration* on page 3-8. Other than in view-only mode, if the user pushes a front panel button when the switcher is in executive mode, that button's associated LED flashes twice and goes out.

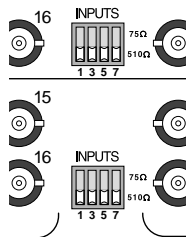
To toggle executive mode on or off, press and hold the RGBHV and Audio buttons for approximately two seconds. The RGBHV and Audio LEDs blink twice to indicate the mode change. Release the RGBHV and Audio buttons. To toggle the executive mode state again, press and hold the RGBHV and Audio buttons again.

System reset to factory defaults

To reset the switcher to the factory default settings, press and hold the Esc button on the front panel while AC power is being applied. Continue to hold the Esc button until the power up sequence is completed (all LEDs turn off, the Video and Audio LEDs turn on, the Esc LED blinks, and the Power LED (if equipped) turns on). System reset clears all ties and presets and sets all audio gain levels to unity gain (+0dB).

Rear Panel Controls

The CrossPoint 168 and 1616 have sync termination switches on the rear panel for inputs 1, 3, 5, and 7. The switches provide a way to condition non-TTL sync levels greater than 5 Vp-p, enabling the sync to be properly passed from input to selected output(s). The CrossPoints have two sets of sync termination switches; one for horizontal or combined sync and a second set for vertical sync. Each switch provides the option of selecting either 510 ohms or 75 ohms. The 75 ohms position is required only for an input with non-TTL sync, greater than 5V p-p. The normal position is 510 ohms.



NOTE *An input that produces an out of sync display, a display that is rolling vertically and/or tearing horizontally, could indicate a non-TTL sync input. A device is known to output non-TTL sync levels (greater than 5V p-p) should be connected to one of the inputs with sync termination, and the termination switches for that input should be set to the 75 ohm position. If you're not sure, check the specifications in the user's manual for the input device.*

Worksheets

Rather than trying to remember the configuration for each preset, use worksheets to record this information. Make copies of the blank worksheets on page 3-19 and use one for each preset configuration. The forms accommodate all of the CrossPoint models. Cross off all unused or inactive inputs and outputs. Use different colors for video and audio.

Worksheet example 1: Entering system equipment

Figure 3-18 shows a worksheet for a CrossPoint 128 HVA in a fictional organization with the system hardware annotated. Inputs 10 and 11 and output 7 have no connections in this organization, so they have been crossed out on the worksheet. On this example, preset 3 is used for the weekly status meeting. Choose your own method of notation.

Operation, cont'd

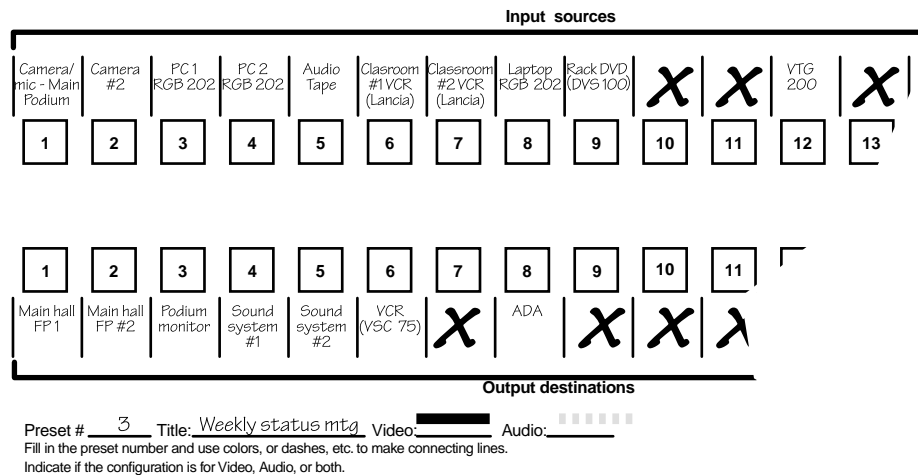


Figure 3-18 — Worksheet example 1: System equipment

Worksheet example 2: Drawing ties

Figure 3-19 continues from worksheet example 1 by showing the video and audio ties that make up the configuration of preset 3, a solid ink line shows video ties, and a dashed pencil line shows the audio ties. In this example, the image of the presenter, from the main podium camera (input 1), is displayed in the main hall (output 1), to the overflow crowd in the conference room (output 4), and in the lobby (output 8). The image is also tied to the VCR (output 6). The presenter has a presentation on her laptop computer (input 4) that is displayed in the main hall (output 2) and locally on the podium (output 3). The audio from her microphone (input 3) is played in the hall (output 1), in the conference room (output 4), and sent to the VCR. Classical music from the CD player (input 5) is being played in the background in the main hall on sound system #2 (output 5), and in the lobby (output 8).

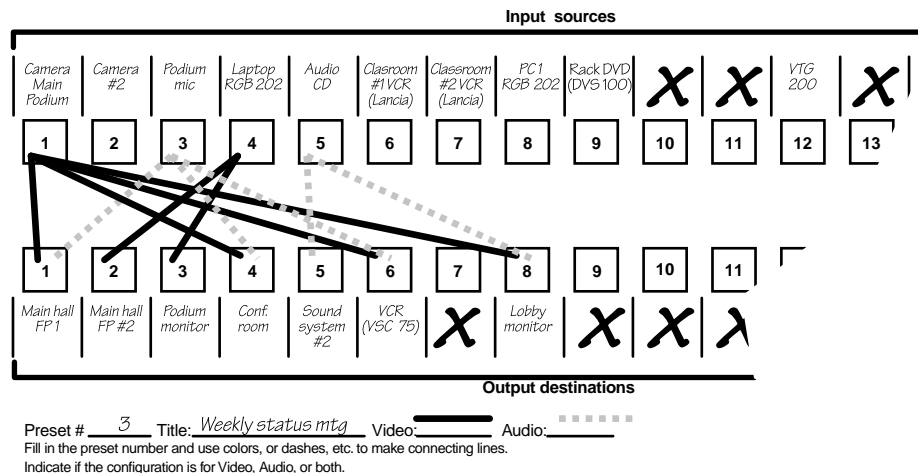


Figure 3-19 — Worksheet example 2: Status meeting configuration

Worksheet example 3: Test configuration

The A/V system in our fictional organization needs to be fine tuned on a regular basis. Figure 3-20 shows a typical test configuration, with an Extron video test generator (input 12) generating a test pattern to all monitors (outputs 1, 2, 3, 4, and

8). Sound checks are run from the CD player (input 5) to all audio systems (outputs 1, 2, 4, 5, and 8).

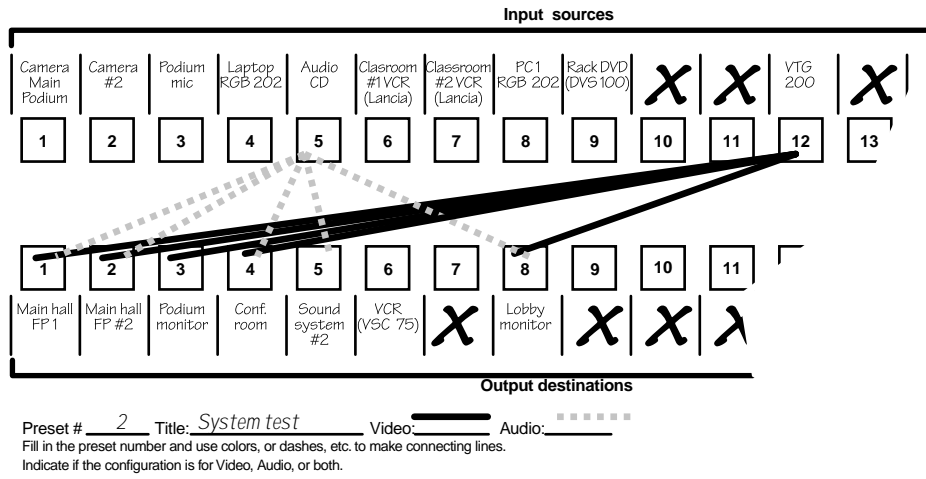
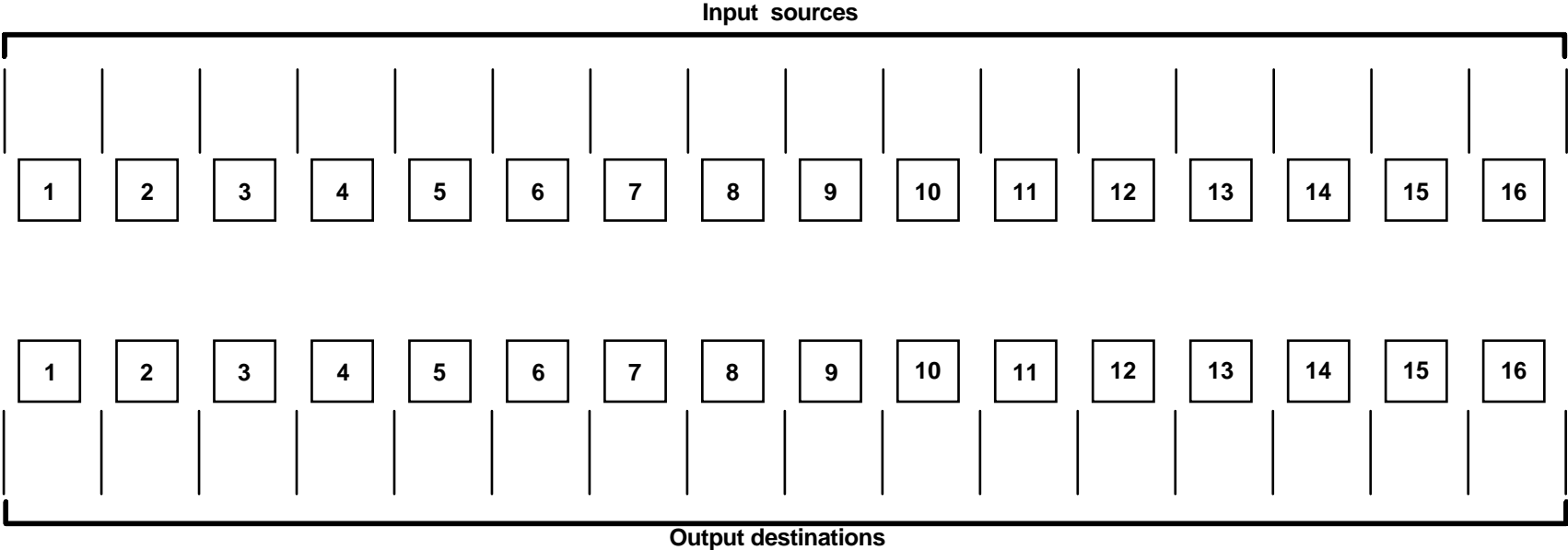


Figure 3-20 — Worksheet example 3: Test configuration

Operation, cont'd

Matrix Switchers Configuration Worksheet



Preset # _____ Title: _____ Video: _____ Audio: _____
 Fill in the preset number and use colors, or dashes, etc. to make connecting lines.
 Indicate if the configuration is for Video, Audio, or both.

Operation, cont'd



4 Chapter Four

Programmer's Guide

Host-to-Switcher Instructions

Switcher-Initiated Messages

Switcher Error Responses

Using the Command/Response Table

Command/Response Table

Programmer's Guide

The switcher's rear panel RS-232/RS-422 connector (figure 4-1) can be connected to the serial port output of a host device such as a computer or control system. This connection makes software control of the switcher possible.

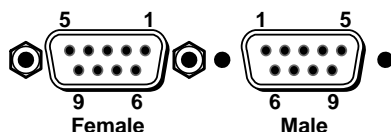


Figure 4-1 — RS-232/RS-422 connector pin arrangement

NOTE The CrossPoint Series Matrix Switchers are factory configured for RS-232 control. To use the switcher under RS-422 control, an internal cable must be moved. Refer to Appendix B for the procedure for moving the cable.

The RS-232/RS-422 connector on the CrossPoint Series switcher is a 9-pin D female connector with the following pin assignments.

Pin	RS-232	Function	RS-422	Function
1	—	Not used	TX-	Transmit data (-)
2	TX	Transmit data	TX+	Transmit data (+)
3	RX	Receive data	RX+	Receive data (+)
4	—	Not used	RX-	Receive data (-)
5	Gnd	Signal ground	Gnd	Signal ground
6	—	Not used	—	Not used
7	—	Not used	—	Not used
8	—	Not used	—	Not used
9	—	Not used	—	Not used

The protocol is 9600 baud, 8-bit, 1 stop bit, no parity, and no flow control.

Host-to-Switcher Instructions

The switcher accepts SIS (Simple Instruction Set) commands through the RS-232/RS-422 port. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each switcher response to an SIS command ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

Switcher-Initiated Messages

When a local event such as a front panel operation occurs, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below (underlined).

(C) Copyright 2001, Extron Electronics "CrossPoint/Mav/Matrix", Vx.xx ↵

The copyright message is initiated by the switcher when it is first powered on. Vx.xx is the firmware version number.

RECONFIG ↵

The reconfig message is initiated by the switcher when a front panel operation has occurred, an audio gain adjustment has been completed, or a memory preset has been recalled.

- RAM Test Failed ↵
- ROM Checksum Failed ↵
- EEPROM Reset (Presets/Attenuators) ↵
- Serial EEPROM Reset (Current Settings) ↵
- Invalid Jumpers ↵

If an error occurs during power-up, the switcher initiates one or more of the messages listed above.

All Configuration Memory Cleared ↵

The memory cleared message is initiated by the switcher when a system reset has occurred. See *System reset to factory defaults* on page 3-16.

The switcher does not expect a response from the host, but, for example, the host program might request a new status.

Switcher Error Responses

When the switcher receives an SIS command and determines that it is valid, it performs the command and sends a response to the host device. If the switcher is unable to perform the command because the command is invalid or contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

- E01 — Invalid input channel number (too large)
- E10 — Invalid command
- E11 — Invalid preset number (too large)
- E12 — Invalid output number (too large)
- E13 — Invalid value (out of range)
- E14 — Illegal command for this configuration
- E17 — Timeout (only caused by direct write of global presets)

Using the Command/Response Table

The command/response table begins on the next page. Lower case letters are acceptable in the command field only where indicated. Symbols are used throughout the table to represent variables in the command/response fields. Command and response examples are shown throughout the table.

ASCII to HEX Conversion Table										Esc 1B	CR 0D	LF 0A		
Space 20	!	21	"	22	#	23	\$	24	%	25	&	26	'	27
(28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
0 30	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8 38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@ 40	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H 48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P 50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X 58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
` 60	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h 68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p 70	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x 78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

Programmer's Guide, cont'd

Command/Response Table

Symbol Definitions:

- ↵ = Carriage return/line feed
- ← = Carriage return (no line feed)
- = Space
- [x1] = Input number 01 – 08 (CrossPoint 84, 88);
 01 – 12 (CrossPoint 124, 128);
 01 – 16 (CrossPoint 168, 1616)
- [x2] = Output number 01 – 04 (CrossPoint 84, 124);
 01 – 08 (CrossPoint 88, 128, 168);
 01 – 16 (CrossPoint 1616)
- [x3] = Input number (for tie) 0 – maximum number of inputs (0=disconnected)
- [x7] = Audio gain 0 – 9 (1dB/step)
- [x8] = Audio attenuation 1 – 15 (1dB/step)
- [x9] = Numeric dB value -15 to +09
- [xa] = Preset number 00 – 16 (0 = current configuration)
- [xb] = Preset number 01 – 16
- [xc] = Executive mode 1 = on;
 0 = off
- [xd] = Controller software version number to second decimal place

NOTE *Input and output numbers in commands may be entered as either 1-digit or 2-digit numbers. All input and output numbers are specified as 2-digit numbers in the response.*

Command/response table for SIS commands

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Create ties			
Tie input [x3] to output [x2], A & V <i>Example:</i>	[x3] * [x2] ! 1*3!	Out[x2]•In[x3]•All↵ Out03•In01•All↵	Tie input 1 A & V to output 3
Tie input to output, RGBHV only <i>Example¹:</i>	[x3] * [x2] & 10*4&	Out[x2]•In[x3]•RGB↵ Out04•In10•RGB↵	Audio breakaway Tie input 10 RGB to output 4
Tie input [x3] to output [x2], video only <i>Example¹:</i>	[x3] * [x2] % 7*5%	Out[x2]•In[x3]•Vid↵ Out05•In07•Vid↵	Audio breakaway Tie input 7 video to output 5
Tie input [x3] to output [x2], audio only <i>Example:</i>	[x3] * [x2] \$ 12*8\$	Out[x2]•In[x3]•Aud↵ Out08•In12•Aud↵	Audio breakaway Tie input 12 audio to output 8
Quick multiple tie <i>Example:</i>	[Esc]Q[x3]*[x2]!...[x3]*[x2]!↵ [Esc]Q3*4!3*5!3*6!↵	Out Multi In Multi All↵ Out Multi In Multi All↵	Tie input 3 to outputs 4, 5, and 6
Tie input to all outputs <i>Example:</i>	[x3]! 5!	Out Multi In [x3] All↵ Out Multi In 05 All↵	Tie input 5 to all outputs
Audio input gain and attenuation			
Set audio input gain to +dB value <i>Example:</i>	[x1] * [x7] G 1*2G	In[x1]•Aud=[x9]↵ In01•Aud=+02↵	Set input 1 audio gain to +2dB
Set audio input attenuation to -dB value	[x1] * [x8] g	In[x1]•Aud=[x9]↵	
Increment gain up <i>Example:</i>	[x1]{G 5 {G	In[x1]•Aud=[x9]↵ In05•Aud=+03↵	Audio input 5 level incremented from +2dB to +3dB
Decrement gain down <i>Example:</i>	[x1}]G 7 }G	In[x1]•Aud=[x9]↵ In07•Aud=-09↵	Audio input 7 level decremented from -8dB to -9dB

¹ The & tie command for RGB and the % tie command for video can be used interchangeably on the CrossPoint models.

Command/response table for SIS commands (Cont'd)

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Global presets			
Save current configuration as preset <i>Example:</i>	<code>[Xb]</code> , 9,	Spr <code>[Xb]</code> ↵ Spr09 ↵	<u>Command character is a comma</u> Save current ties as preset 9
Recall a preset <i>Example:</i>	<code>[Xb]</code> . 5.	Rpr <code>[Xb]</code> ↵ Rpr05 ↵	<u>Command character is a period</u> Recall preset 5, which becomes the current configuration
Start direct write of global presets	<code>[Esc]P [Xb] ←</code> {Tie commands}	Write Preset <code>[Xb]</code> Ready ↵	Allows direct entry of presets {Define ties for preset}
End direct write of global presets	<code>[Esc]p ←</code>	End Write Preset <code>[Xb]</code> ↵	Saves directly written presets
Quick recall preset	<code>[Esc]. ←</code>	Rpr <code>[Xb]</code> ↵	Command character is a period
<p>NOTE</p> <ol style="list-style-type: none"> 1. This sequence of commands forces the switcher to perform a complete backplane switch within 60 msec of receipt of the Quick recall command. 2. The switcher ignores any invalid command or non-switching commands received between the Start and End commands. 3. If there is no activity for 5 seconds, the switcher returns the timeout (E17) error. 4. The switcher disables front panel switching during this sequence of commands. 5. The switcher returns the invalid command (E10) error if it receives the End command without the start command or the Quick recall command without a prior direct preset write. 6. The switcher must receive the Quick recall command within 100 msec of the End command. 			
<i>Example:</i>	<code>[Esc]P14 ←</code> 1*3! 7*8% 10*4& 12*4\$ <code>[Esc]p ←</code> <code>[Esc]. ←</code>	Write Preset 14 Ready ↵ End Write Preset 14 ↵ Rpr <code>[Xb]</code> ↵	Creates new preset 14 with: A & V Input 1 tied to output 3 Video input 7 tied to output 8 ¹ RGB input 10 tied to output 4 ¹ Audio input 12 tied to output 4 Stops entry, saves preset 14 Recalls the preset
Executive mode			
Lock front panel	X	Exe1 ↵	Enable executive mode
Unlock front panel	x	Exe0 ↵	Disable executive mode
Resets			
Reset global presets	<code>[Esc]zG</code>	ZapG•• ↵	Clear all global presets
Reset audio levels	<code>[Esc]zA</code>	ZapA•• ↵	Reset all audio levels to 0dB
Reset whole switcher	<code>[Esc]zXXX</code>	ZapXXX ↵	Clears all ties and presets, and resets all audio gains to 0dB
View ties, gain, and presets			
View video output tie <i>Example:</i>	V/v <code>[X2]</code> % v7%	Out <code>[X2]</code> •In <code>[X3]</code> •Vid ↵ Out07•In02•Vid ↵	Output 7 video tied to input 2 video
View audio output tie <i>Example:</i>	V/v <code>[X2]</code> \$ V3\$	Out <code>[X2]</code> •In <code>[X3]</code> •Aud ↵ Out03•In06•Aud ↵	Output 3 audio tied to input 6 audio
View gain for input <i>Example:</i>	V/v <code>[X1]</code> G v4G	In <code>[X1]</code> •Aud= <code>[X9]</code> ↵ In04•Aud=-02 ↵	Gain for input #4 is -2dB

Programmer's Guide, cont'd

Command/response table for SIS commands (Cont'd)

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
View preset configuration <i>Example</i> ² :	V/v [x7] . V0.	[x3] • (16 total) • Vid • [x3] • (16 total) • Aud ↵ 08•08•08•08•14•09•11•16•08•01•01•01•08•08•08•08•Vid•05•05•05•05•14•09•11•16•08•01•01•01•05•05•05•05•Aud↵	Preset #0 is current configuration
<p>Each position listed in the response is an input, left = input 1, right= input 16. The number in each position is the output tied to the input represented by that position.</p> <p>Video = Input (I) 8 is tied to Outputs (O)1-4 & O13-16; I14 — O5; I9 — O6; I11 — O7; I16 — O8; I8 — O9; I1 — O10-12.</p> <p>Audio = The same as video except that Input 5 is tied to Outputs 1-4 & 13-16.</p>			
Information requests			
Information request <i>Example</i> :	I/i i	V[x1]X[x2] • A[x1]X[x2] • Exe[xe] ↵ V16X16 • A16X16 • Exe0 ↵	V[x1]X[x2] = V size, A[x1]X[x2] = A Size 16 Video & 16 Audio inputs and outputs, front panel unlocked
Request part number <i>Example</i> :	N/n N	Nxx-xxx-xx ↵ N60-242-06 ↵	See appendix A for part #s CrossPoint 1616HVA part # is 60-242-06
Query software version <i>Example</i> :	Q/q Q	Ver[xd] ↵ Ver2.00 ↵	

² HV models do not display audio configuration, and the number of ties shown varies with the number of video or audio outputs.



CrossPoint Matrix Switchers

Chapter Five

Matrix Software

Matrix Switcher+ Control Program

Button-Label Generator

Matrix Software

Two software programs accompany the CrossPoint Series switchers:

- The Extron Matrix Switchers Control Program (Extron part number 29-015-01), which communicates with the switcher via the RS-232/RS-422 port, provides an easy way for you to set up ties and sets of ties.

NOTE *If your CrossPoint Series switcher was previously set up for RS-232, and your computer comm port uses RS-422, you must change the switcher cabling to match the computer interface. See appendix B for details.*

- The Extron Button-Label Generator, which allows you to design and print labels for the CrossPoint front panel buttons.

Both programs are compatible with Windows 95/98, Windows NT, Windows ME, and Windows 2000. Updates to these programs can be downloaded from the Extron Web site (<http://www.extron.com>).

This chapter describes both programs.

Matrix Switcher+ Control Program

Installing the software

The program is contained on a set of 3.5-inch diskettes, and you should load and run the program from the hard drive.

To install the program from the floppy disks to the hard drive, run SETUP.EXE from the floppy disk and follow the instructions that appear on the screen. The program occupies approximately 3 MB (megabyte) of hard-drive space.

By default, the Windows installation creates a C:\MTRX50 directory, and it places two icons (Matrix Switcher+ Control Program and Matrix Switcher+ Help) into a group or folder named "Extron Electronics".

NOTE *The program was designed to control most Extron matrix switchers, but its operation is limited to the features and configuration of your CrossPoint Series switcher.*

Using the software

Overview

This section is an overview of the Extron Matrix Switcher+ Control Program. The help function contains additional information. See Using the help system for details.

1. To run the Matrix Switcher+ Control Program, double-click on the Matrix Switcher+ Control Program icon (shown at left) in the Extron Electronics group or folder.]



MATRIX Switcher+
Control Pgm

2. Click on the comm port that is connected to the RS-232/RS-422 port of the switcher. To set up the software without attaching the switcher to the computer, see *Using emulation mode* on page 5-4.

The Extron Matrix Switcher+ Control Program window (figure 5-1 and figure 5-2) displays the current configuration of the attached matrix.

3. To set up audio in follow mode (audio and video have the same tie configuration), select the Follow box at the bottom of the window. To set up audio in breakaway mode (audio and video have different tie configurations), deselect the Follow box.

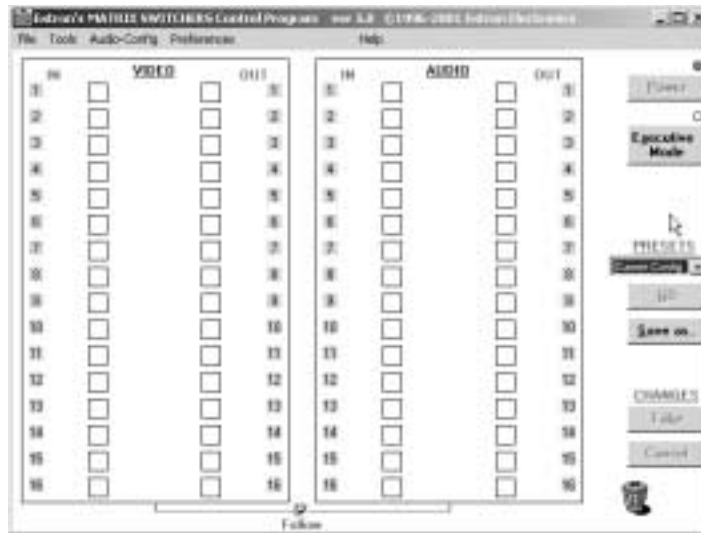


Figure 5-1 — Extron Matrix Switcher+ Control Program window (blank)

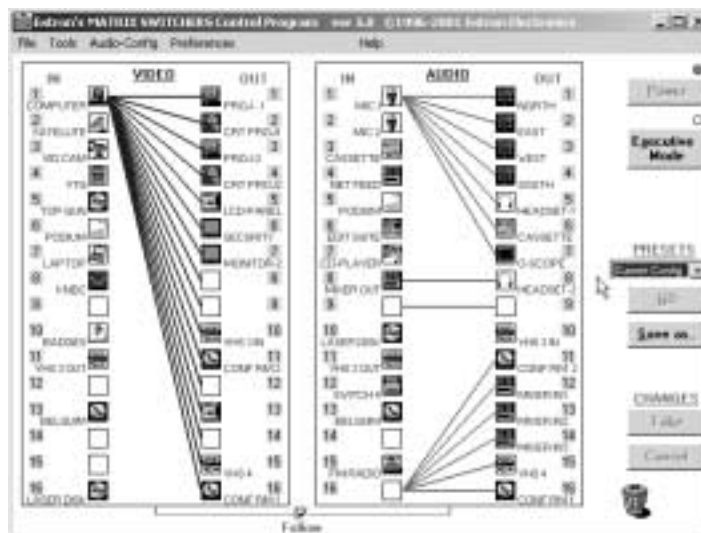


Figure 5-2 — Sample program window (complete)

4. To make the control program easier to use, assign a device icon to each input and output. Click on a box that represents an input or output, and drag the desired icon onto the box from the icon palette that appears.
5. To create a tie, drag an input box to one or more output boxes. To remove a tie, drag the output box to its tied input box.

Windows buttons

The buttons on the right side of the window perform the following functions:

Power — Unavailable for CrossPoint Series switchers, because the switcher power cannot be controlled via software.

Executive mode — Allows you to lockout front panel operations, except for the view-only mode functions

Presets menu — Displays a list of up to 16 presets. You can select a preset from the list to display it in the window.

Matrix Software, cont'd

Go — Activates the selected preset as the current configuration.

Save as — Allows the current set of ties to be saved as a preset. Enter the preset number when prompted to do so.

Changes - Take — Allows you to save to file any changes made to the displayed configuration.

Changes - Cancel — Returns to the previous screen, undoing any changes you have made.

Windows menus

File menu —

Save matrix settings as — Saves a complete set of up to 16 presets, plus the last active setting (preset #0), to a file. Saved settings include audio gain settings (if specified), assigned icons, and icon captions.

Restore matrix settings from — Loads and activates a previously saved setting file.

Save this-session's settings — Saves the current assigned icons and icon captions.

Restore last-session's settings — Loads the icons and icon captions that were saved during the last session. If you saved the previous session's changes to disk the last time you exited the program, the ties from that session are also loaded.

Select printer — Selects the target printer.

Print tie map — Prints the tie set that is displayed on the screen.

Exit — Closes the Extron Matrix Control Program.

Tools menu —

Assign device icons — Displays the complete set of input and output device icons. You can drag any of these icons to the input and output boxes.

Edit device palette — Allows you to add your own device icon graphics.

Audio gain settings — Displays the audio gain level setting for a single input or for all inputs and allows you to change it.

Name presets — Allows you to assign a name to each of the 16 memory presets.

Show RS-232 strings — Displays the ASCII commands that are used by the current configuration. You can refer to these for RS-232 programming.

Initialize — Initializes and clears any or all of the following: ties, presets, audio configuration, preset titles, icon names, and icons.

Audio-config — Displays the audio gain level settings for each input and allows you to change them.

Preferences menu —

Immediate changes — Causes changes to take effect immediately.

Hold/verify changes — Delays implementation of changes until the Changes - Take button is pressed.

Ties as lines — Displays ties as lines.

Ties as crosspoints — Displays ties as a grid of inputs and outputs.

Using emulation mode

Emulation mode allows you to set up the software without attaching the switcher to the computer. To use emulation mode, do the following:

1. Start the program as described in step 1 on page 5-2.
2. Choose Emulate, and click OK.
3. Choose an emulation file to open, and click OK. The file DEMO.MTX provides a sample of a completed matrix setup. The file NEW.INI provides a blank setup to get you started.
4. Enter the file name under which you want to save any changes to the file, and click OK.
5. Select the number of video boards, audio boards, and matrix model for which you are preparing a configuration, and click OK.
6. Continue using the program as described in steps 3 through 5, beginning on page 5-2.

Using the help system

For information about program features, you can access the help program in any of the following ways:

- From the Extron Electronics program folder or group, double-click on the Matrix Switcher Help icon (shown at left).



MATRIX Switcher+
Help

- From within the Matrix Switcher+ Control Program, click on the Help menu on the main screen.
- From within the Matrix Switcher+ Control Program, press the F1 key.

Button-Label Generator

The program is contained on the same set of 3.5-inch diskettes as the Matrix Switcher+ Control Program and is installed automatically when you install that program.

By default, the Windows installation goes in the C:\BUTTONS directory, and the Button-Label Generator icon is placed in the “Extron Electronics” group or folder.

Using the software

1. To run the Button-Label Generator program, double-click on the Button-Label Generator icon (shown at left) in the Extron Electronics group or folder, and click OK when prompted.



Button-Label
Generator

2. The Extron's Button-Label Generator window appears (figure 5-3). Under System selection, choose Mtrx50/MAV/XPoint.
3. Using normal Windows controls, you can create and print labels that can be placed in the label windows on the front panel of the switcher.

For information about using the program, you can access the help program by clicking on the Help menu on the main screen and choosing Show Help.

You can also see an example of a completed Extron's Button-Label Generator window by clicking on the Help menu on the main screen, choosing Show Help, and clicking on the Load Demo button.

Matrix Software, cont'd

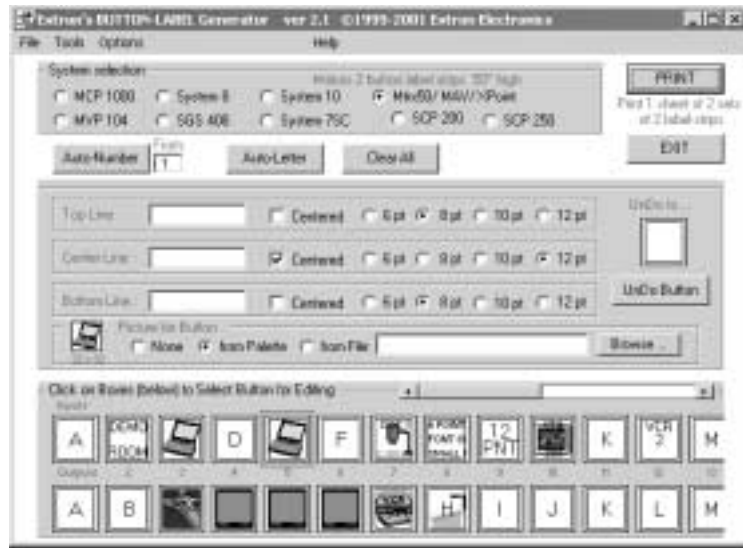


Figure 5-3 — Extron's Button-Label Generator window



CrossPoint Matrix Switchers

A

Appendix A

Specifications

Specifications

Part Numbers

Specifications

Video

Routing	84 series	8 x 4 matrix
	88 series	8 x 8 matrix
	124 series	12 x 4 matrix
	128 series	12 x 8 matrix
	168 series	16 x 8 matrix
	1616 series	16 x 16 matrix
Gain	Unity	
Bandwidth		
CrossPoint 84/88/124/128 ...	Minimum	200 MHz (-3dB), fully loaded
	Maximum	230 MHz (-3dB), fully loaded
	0 - 10 MHz	no more than +0.1dB to -0.1dB
	0 - 130 MHz	no more than +4dB to -0.5dB
CrossPoint 168/1616	Minimum	200 MHz (-3dB), fully loaded
	Maximum	210 MHz (-3dB), fully loaded
	0 - 10 MHz	no more than +0.1dB to -0.1dB
	0 - 130 MHz	no more than +0.8dB to -0.5dB
Crosstalk	-50dB @ 5 MHz, -45dB @ 10 MHz	
Switching speed	200 nS (max.)	

Video input

Number/signal type	8, 12, or 16 RGBHV, RGBS, RGsB, RsGsBs, HDTV, component video, S-video, composite video	
Connectors	84/88 series	8 x 5 BNC female
	124/128 series	12 x 5 BNC female
	168/1616 series	16 x 5 BNC female
Minimum/maximum levels	Analog	0.5V to 2.0V p-p with no offset at unity gain
Impedance	75 ohms	
Return loss	-30dB @ 5 MHz	
Maximum DC offset	1.5V	

Video output

Number/signal type	4, 8, or 16 RGBHV, RGBS, RGsB, RsGsBs, HDTV, component video, S-video, composite video	
Connectors	84/124 series	4 x 5 BNC female
	88/128 series	8 x 5 BNC female
	168 series	8 x 5 BNC female
	1616 series	16 x 5 BNC female
Minimum/maximum level	2V p-p	
Impedance	75 ohms	
Return loss	-30dB @ 5 MHz	
DC offset	±5mV maximum with input at 0 offset	

Sync

Input type	RGBHV, RGBS, RGsB, RsGsBs	
Output type	RGBHV, RGBS, RGsB, RsGsBs	
Input level	0.5V to 5.0V p-p, 4.0V p-p normal	
Output level	AGC to TTL	4V to 5V p-p
Input impedance		
84/88/124/128 Series	All inputs	510 ohms
168/1616 Series	Inputs 1, 3, 5, 7	75 or 510 ohms, switchable
	Inputs 2, 4, 6, 8, and 9 through 16 ...	510 ohms

Output impedance	75 ohms
Polarity	Positive or negative (follows input)

Audio — audio models only


Routing	84 series 8 x 4 stereo matrix
	88 series 8 x 8 stereo matrix
	124 series 12 x 4 stereo matrix
	128 series 12 x 8 stereo matrix
	168 series 16 x 8 stereo matrix
	1616 series 16 x 16 stereo matrix
Gain	Unbalanced 0dB, balanced +6dB
Frequency response	20 Hz to 20 kHz, ± 0.05 dB
THD + Noise	0.03% @ 1 kHz at rated maximum output drive
S/N	> 90dB, output 21dBu, balanced, at rated maximum output drive
Crosstalk	> -80dB @ 1 kHz, fully loaded
Stereo channel separation	> -80dB @ 1 kHz
CMRR	>75dB @ 20 Hz to 20 kHz

Audio input — audio models only

Number/signal type	8, 12, or 16 stereo, balanced/unbalanced
Connectors	8, 12, or 16 3.5 mm captive screw connectors, 5 pole
Impedance	>20 kohm, balanced, DC coupled
	>10 kohm, unbalanced, DC coupled
Maximum input level	+19.5dBu, (balanced or unbalanced) @ stated %THD+N
Input gain adjustment	-15dB to +9dB, adjustable per input by RS-232 or front panel

Audio output — audio models only

Number/signal type	4, 8, or 16 stereo, balanced/unbalanced
Connectors	4, 8, or 16 3.5 mm captive screw connectors, 5 pole
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	± 0.1 dB channel to channel
Maximum level (Hi-Z)	> +21dBu, balanced or unbalanced at stated %THD+N
Maximum level (600 ohm)	> +15dBm, balanced or unbalanced at stated %THD+N

 0dBu = 0.775 volts (RMS).

Control/remote — switcher

Serial control port	1 RS-232 or RS-422, 9-pin female D connector
Baud rate and protocol	9600, 8-bit, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND
Program control	Extron's control program for Windows® Extron's Simple Instruction Set™ – SIS™

General

Power	100VAC to 240VAC, 50/60 Hz, internal, auto-switchable
	84/88/124/128 series 30 watts
	168/1616 series 36 watts
Temperature/humidity	Storage -40° to +158°F (-40° to +70°C) / 10% to 90%, non-condensing
	Operating +32° to +104°F (0° to +40°C) / 10% to 90%, non-condensing
Rack mount	Yes, with included parts
	84/88/124/128 series 3U high
	168/1616 series 6U high

Specifications, cont'd

Enclosure type	Metal
Enclosure dimensions	
84/88/124/128 series	5.25" H x 17.0" W x 9.5" D 13.3 cm H x 43.2 cm W x 24.1 cm D
168/1616 series	10.5" H x 17.0" W x 10.1" D 26.7 cm H x 43.2 cm W x 25.7 cm D (Depth excludes connectors. Width excludes rack ears.)
Shipping weight	
84/88/124/128 series	17 lbs (7.7 kg) DIM weight..... 25
168/1616 series	24 lbs (10.8 kg) DIM weight..... 34
Vibration	ISTA/NSTA 1A in carton (International Safe Transit Association)
Approvals	UL, CUL, CE, FCC Class A
MTBF	30,000 hours
Warranty	2 years parts and labor

NOTE Specifications are subject to change without notice.

Part Numbers

CrossPoint part numbers

Extron Part	Part #
CrossPoint 84HV	60-219-05
CrossPoint 84HVA	60-219-06
CrossPoint 88HV	60-325-05
CrossPoint 88HVA	60-325-06
CrossPoint 124HV	60-326-05
CrossPoint 124HVA	60-326-06
CrossPoint 128HV	60-220-05
CrossPoint 128HVA	60-220-06
CrossPoint 168HV	60-330-05
CrossPoint 168HVA	60-330-06
CrossPoint 1616HV	60-242-05
CrossPoint 1616HVA	60-242-06
Matrix Switchers+ Control Program and Button-Label Generator	29-015-01
CrossPoint Matrix Switchers User's Manual	68-353-02

Optional accessories

Extron Part	Part #
Rack/desk mounting kit	70-077-03
MKP 1000	
Grey	60-239-01
Black	60-239-02
White	60-239-03
MCP 1000M (master)	60-298-01
MCP 1000S (slave)	60-298-02
Captive screw audio connector	10-319-10
RCA-to-BNC adapter	10-264-01
SVHS - BNC adapter	26-353-01

Cables

When using signals with a scanning frequency of 15-125 kHz and running distances of 100 feet or more, use high resolution BNC cables to achieve maximum performance.

Bulk cable

Extron Part	Part #
Super High Resolution Cable	
Bulk SHR-1, 500'	22-098-02
Bulk SHR-1, 1000'	22-098-03
Bulk SHR-4, 500'	22-099-02
Bulk SHR-5, 500'	22-100-02
BNC SHR crimp connectors, qty. 50	100-075-51
BNC-4 Mini HR Cable	
Bulk BNC 4-500' HR	22-032-02
Bulk BNC 4-1000' HR	22-032-03
BNC-5 Mini HR Cable	
Bulk BNC 5-500' HR	22-020-02
Bulk BNC 5-1000' HR	22-020-03
Plenum BNC-5 Mini HR Cable	
Bulk BNC 5-500' HRP	22-103-02
Bulk BNC 5-1000' HRP	22-103-03
Plenum Seventeen Conductor Installation Cable	
Bulk install plenum, 500'	22-111-03
Bulk install plenum, 1000'	22-111-04

Assorted connectors

BNC connectors	
BNC Mini HR crimp connectors, qty. 50	100-074-51
BNC Super High Resolution crimp connectors, qty. 50	100-075-51
BNC bulkhead connectors, qty. 50 (for custom wall plates)	100-076-51

Pre-cut cables

BNC-4 Mini HR cable is used for RGBS cable runs, and BNC-5 Mini HR cable is used for RGBHV cable runs. Either type can also be used for composite video, S-video, or RGsB. All Extron BNC cables have male connectors on both ends. A plenum version of the BNC-5 Mini HR cable is also available.

BNC-4 Mini HR Cable	
BNC-4-25' MHR (25 feet/7.5 meters)	26-210-04
BNC-4-50' MHR (50 feet/15.0 meters)	26-210-05
BNC-4-75' MHR (75 feet/23.0 meters)	26-210-06
BNC-4-100' MHR (100 feet/30.0 meters)	26-210-07
BNC-4-150' MHR (150 feet/45.0 meters)	26-210-08
BNC-4-200' MHR (200 feet/60.0 meters)	26-210-09
BNC-4-250' MHR (250 feet/75.0 meters)	26-210-54
BNC-4-300' MHR (300 feet/90.0 meters)	26-210-53

Specifications, cont'd

Extron Part	Part #
BNC-5 Mini HR Cable	
BNC-5-25' MHR (25 feet/7.5 meters)	26-260-03
BNC-5-50' MHR (50 feet/15.0 meters)	26-260-04
BNC-5-75' MHR (75 feet/23.0 meters)	26-260-16
BNC-5-100' MHR (100 feet/30.0 meters)	26-260-05
BNC-5-150' MHR (150 feet/45.0 meters)	26-260-12
BNC-5-200' MHR (200 feet/60.0 meters)	26-260-06
BNC-5-250' MHR (250 feet/75.0 meters)	26-260-18
BNC-5-300' MHR (300 feet/90.0 meters)	26-260-14

NOTE *Bulk cable in lengths up to 5000' rolls is available with or without connectors.*



Appendix B

Reference Information

Hardware Upgrades

Button Labels

Reference Information

Hardware Upgrades

This appendix contains procedures for performing hardware maintenance procedures such as swapping the RS-232 and RS-422 ports, installing a new firmware update, and replacing the fuse.

Opening the switcher

Before you can perform any of the hardware upgrade procedures, you must open the switcher. The interior of the CrossPoint 84, 88, 124, and 188 switchers is accessed by removing the top cover. The interior of the CrossPoint 168 and 1616 is accessed by removing the front cover.

Opening the CrossPoint 84, 88, 124, and 128

To open the CrossPoint 84, 88, 124, or 128 switcher, do the following:

1. Disconnect the power cord from the switcher.
2. If the switcher is rack mounted, remove the switcher from the rack and place it on a clean workspace.
3. Remove the eight screws that secure the switcher's top cover as shown in figure B-1.

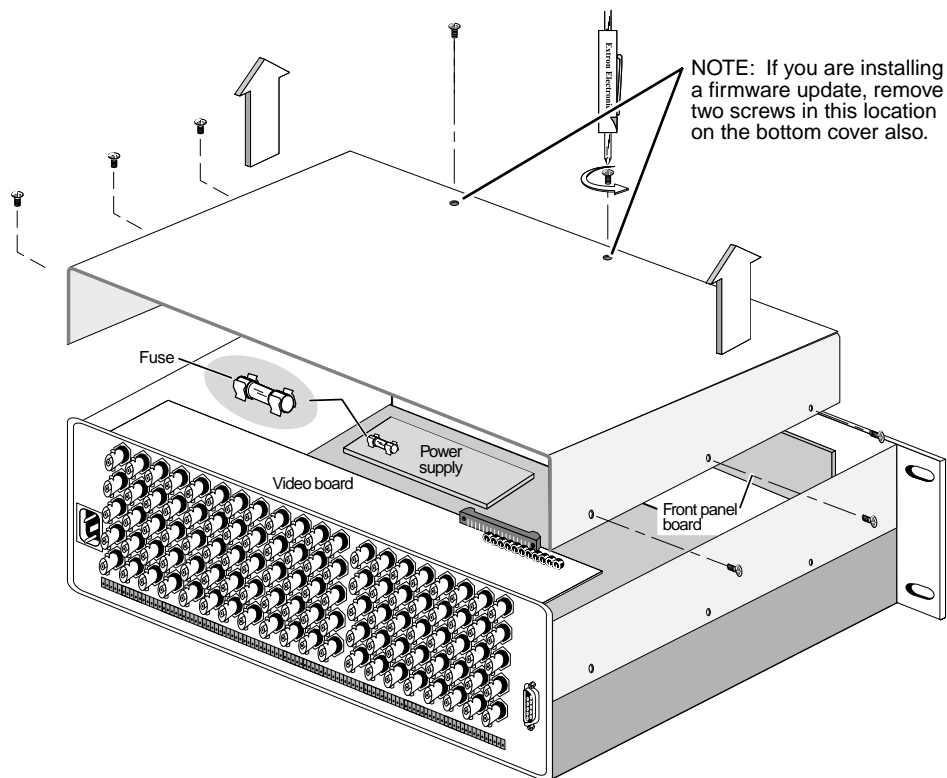
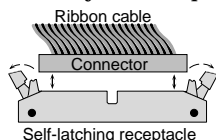


Figure B-1 — Removing the top cover

4. Lift the top cover straight up as shown in figure B-1. Lift the cover evenly to clear the grooves at the edge of the rear panel.

5. If you are updating the firmware, remove the two screws at the front edge of the bottom cover, press the two receptacle tabs on the top cable outward as shown at the left, and pull back gently on the cable connector to remove it from the receptacle. Lay the front panel down in front of the switcher.



Opening the CrossPoint 168 and 1616

To open the CrossPoint 168 or 1616 switcher, do the following:

1. Disconnect the power cord from the switcher.
2. Remove the ten screws that secure the switcher's front cover as shown in figure B-2. Three internal cables connected to the front panel can be damaged if strained. Carefully tilt the front panel away from the main body of the switcher.

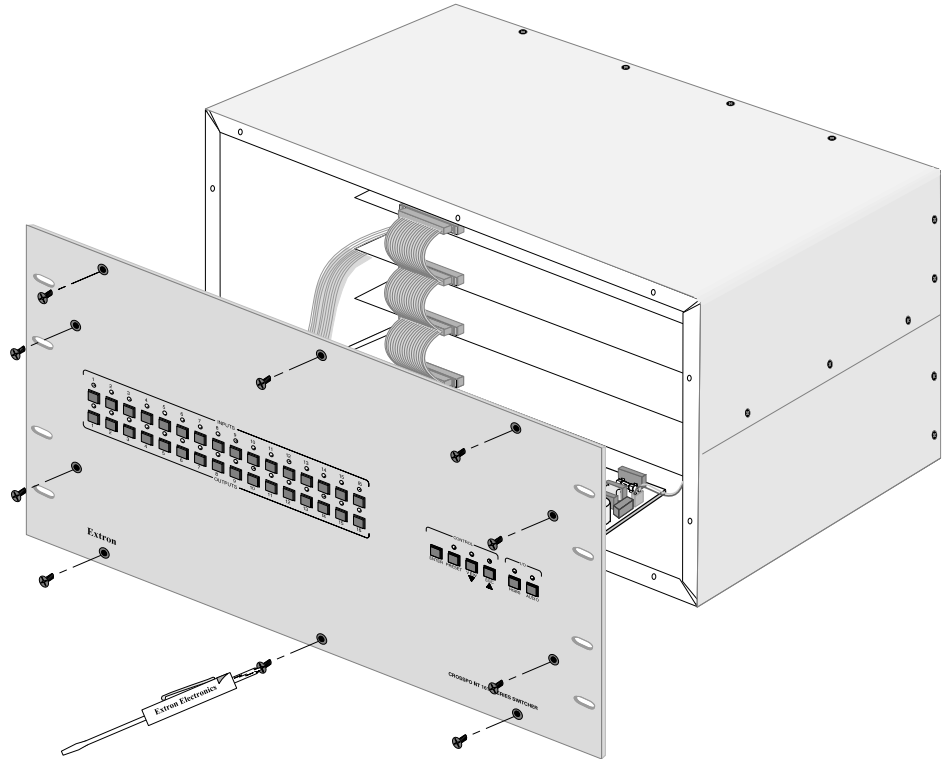
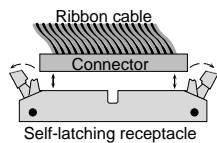


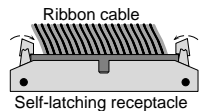
Figure B-2 — Removing the front cover

3. Press the two receptacle tabs on the top cable outward as shown at the left, and pull back gently on the cable connector to remove it from the receptacle. Lay the front panel down in front of the switcher.



Closing the switcher

1. Reinstall any cables removed. To plug a self latching cable into the desired receptacle, align the holes in the connector with the pins in the receptacle, and press evenly until the receptacle tabs lock into place.
2. Place the top cover (CrossPoint 84, 88, 124, and 128) and/or front cover (all models) in place and replace all the screws removed in *Opening the switcher* on page B-2.



Swapping the serial ports

The CrossPoint switchers are factory configured for RS-232 use. If you want to use RS-422 and the switcher is configured for RS-232, or if you want to use RS-232 and the switcher is configured for RS-422, do the following:

Reference Information, cont'd

1. Follow the appropriate instructions in *Opening the Switcher* on page B-2 to gain access to the interior of your switcher.
2. Locate the switcher's front panel board (figure B-3).

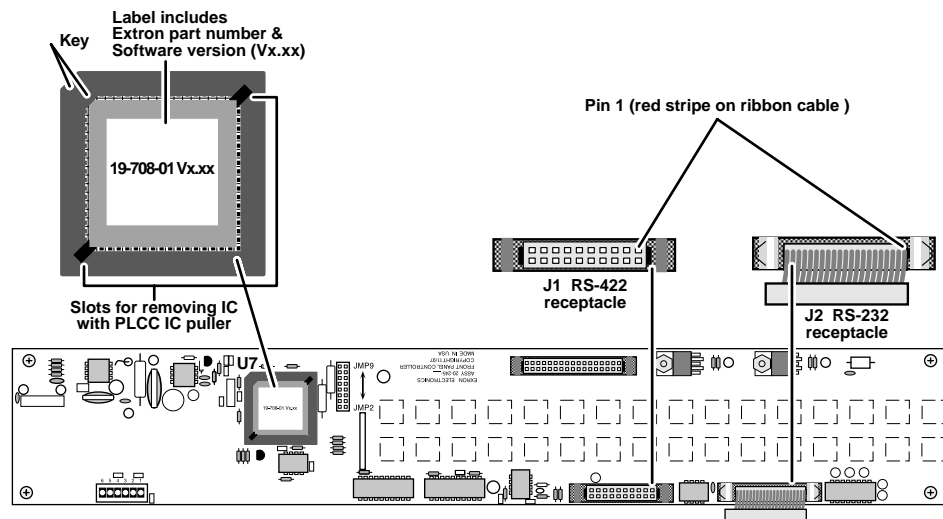
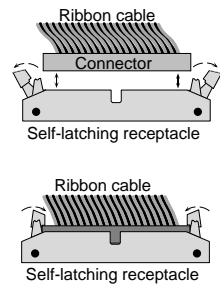


Figure B-3 — Front panel board

3. On the side of the front panel board that faces the rear of the switcher, locate the RS-232 ribbon cable. On any CrossPoint model, the RS-422 ribbon cable receptacle, which is normally empty, is located to the left of the RS-232 ribbon cable receptacle.
4. To remove the cable from the current receptacle, press the two receptacle tabs outward as shown at the left, and pull up gently on the cable connector to remove it from the receptacle.
5. To plug the cable into the desired receptacle, align the holes in the connector with the pins in the receptacle, and press evenly until the receptacle tabs lock into place.
6. Reinstall the switcher's cover. See *Closing the switcher* on page B-3.
7. Attach the power cord to the switcher and to the AC power source. Make sure the switcher is working properly.
8. If the switcher was removed from a rack, remove its power cord, reattach the switcher to the rack, and reconnect the power cord.
9. Reconnect the input and output cables.



Installing a firmware update

NOTE *The IC that contains the firmware for the matrix switcher also contains the memory in which presets and audio levels are saved. When you replace the IC, these settings will be lost. You may want to record the presets and audio levels before you replace the IC.*

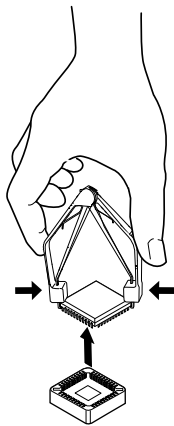
To replace the firmware, do the following:

1. Follow the appropriate instructions in *Opening the Switcher* on page B-2 to gain access to the interior of your switcher, including the instructions for removing the front panel.

2. Locate the RS-232/RS-422 ribbon cable that connects the front panel board to the rear panel RS-232/422 port (figure B-3). Note which receptacle on the front panel board that the RS-232/RS-422 cable plugs into, and remove the cable from its receptacle (see step 4 in *Swapping the serial ports*).

NOTE *Do not touch the components inside the switcher without being electrically grounded. Electrostatic discharge (ESD) can damage ICs, even if you cannot feel, see, or hear it.*

3. Unplug the power cable from the front panel board.
4. Place the front panel board, button side down, on a suitable workspace.
5. Locate IC U7 (figure B-3).
6. Use the PLCC IC puller to remove the existing firmware IC. Squeeze the tool to align its hooks with the slots in opposite corners of socket U7. Insert the hooks, squeeze gently, and pull the IC straight out of the socket. Set the IC aside.



7. Note the key (angled corner) of the new firmware IC and the dot on the underside that indicates pin 1 (figure B-4). Orient the IC to match the key and pin 1 (indicated by arrow) on the socket, and carefully press the IC in place.
8. Reinstall the power cable that was removed in step 3.
9. Reinstall the RS-232/RS-422 cable removed in step 2. Ensure the RS-232/RS-422 ribbon cable is plugged back into the proper receptacle for the communications format desired (RS-232 or RS-422).
10. Reinstall the switcher's front panel and cover. See *Closing the switcher* on page B-3.

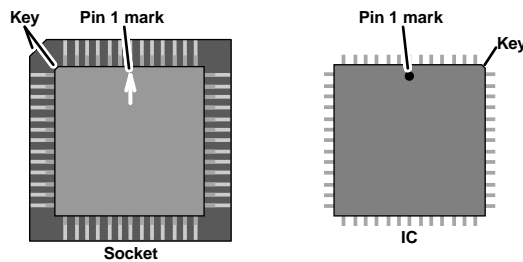


Figure B-4 — Key and pin 1 mark

WARNING *If you choose to check for proper operation before putting the cover back on, ensure that tools and hands are outside the switcher and then perform step 11. After recognizing the new IC, the switcher should power up normally. Unplug the AC power cord, and reinstall the switcher.*

11. Reinitialize the switcher to recognize the new IC as follows:
 - a. Connect the power cord to the AC power source.
 - b. Press and **hold** the Enter button while you connect the power cord to the switcher.

Reference Information, cont'd

- c. Observe that the Input, Output, Preset, View, and Esc LEDs all flash.
- d. Release the Enter button.
12. Ensure that the switcher is working properly.
13. If the switcher was removed from a rack, remove its power cord, reattach the switcher to the rack, and reconnect the power cord.
14. Reconnect the input and output cables.

Replacing the AC fuse (CrossPoint 84, 88, 124, and 128 only)

The AC fuse on the power supply board is a user-replaceable component of the CrossPoint 84, 88, 124, and 128. To replace the AC fuse, do the following:

1. Follow the instructions in *Opening the CrossPoint 84, 88, 124, and 128* on page B-2 to remove the top cover.
2. Locate the fuse on the power supply board (see figure B-1), and remove it from its retaining clips.
3. If test equipment is available, you can check the fuse.
4. Place a new 2A/250V fast-blow fuse in the retaining clips.
5. Reinstall the switcher's cover. See *Closing the switcher* on page B-3.

WARNING *If you choose to check the switcher for proper operation before putting the cover back on, ensure that tools and hands are outside the switcher, and then connect the power cord to the unit and to an AC source. The switcher should power up normally. Unplug the AC power cord, and reinstall the switcher.*

6. Attach the power cord to the switcher and to the AC power source. Make sure the switcher is working properly.
7. If the switcher was removed from a rack, remove its power cord, reattach the switcher to the rack, and reconnect the power cord.
8. Reconnect the input and output cables.

Button Labels

Figure B-5 provides blanks of a 16-button strip of button labels. Feel free to photocopy them or cut them out of the manual, write button information in each button area as desired, and put them in the switcher's label window. For 8-button strips and 12-button strips, use scissors to trim the blank to the appropriate length.

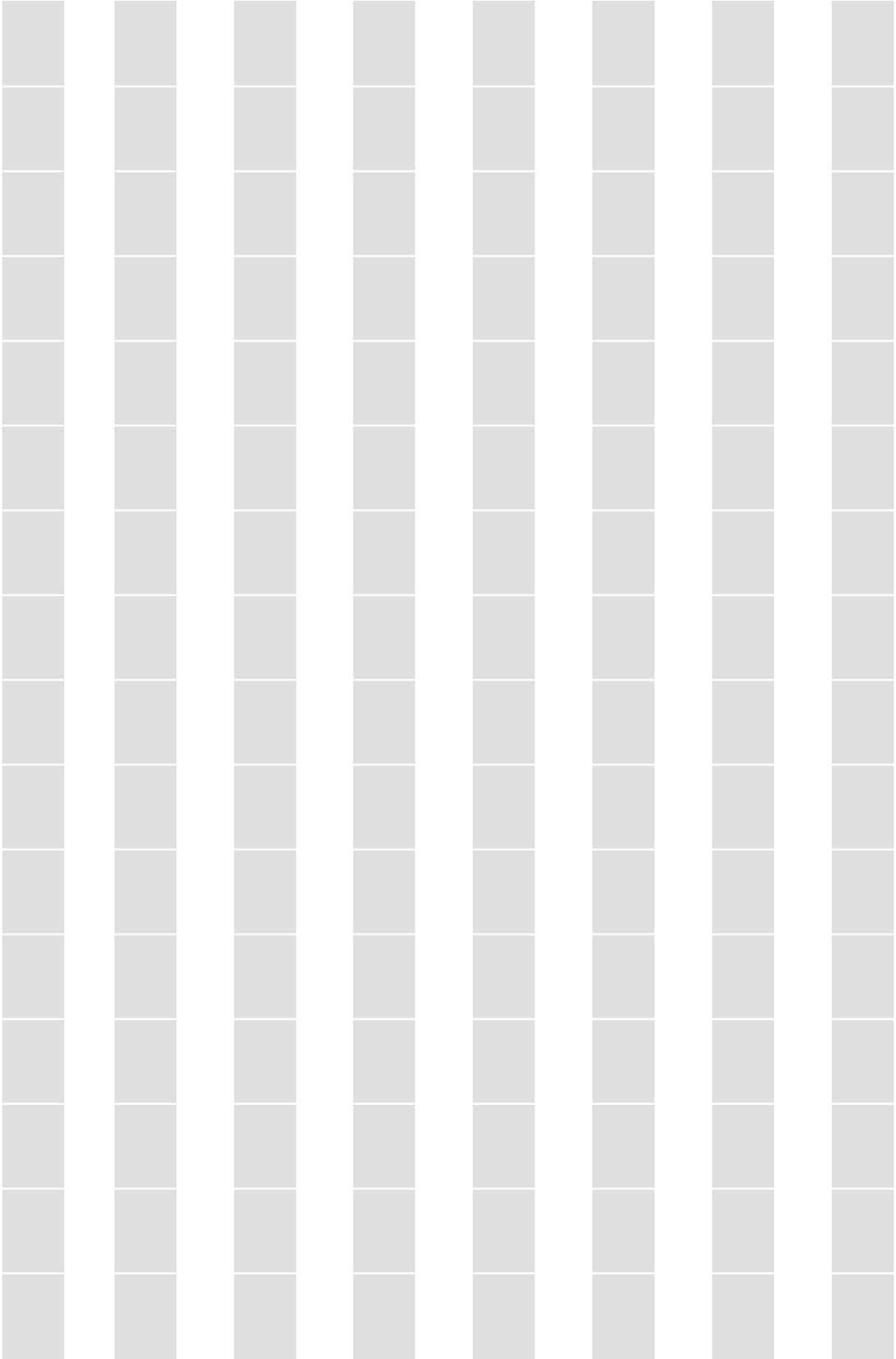


Figure B-5 — Button label blanks, 16-button strip

Reference Information, cont'd

FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of two years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805
United States of America

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Building
Singapore 368363

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), or 65.383.4400 (Asia) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.



Extron Electronics, USA

1230 South Lewis Street, Anaheim, CA 92805
800.633.9876 714.491.1500 FAX 714.491.1517
USA

Extron Electronics, Europe

Beeldschemweg 6C, 3821 AH Amersfoort
+31.33.453.4040 FAX +31.33.453.4050
The Netherlands

Extron Electronics, Asia

135 Joo Seng Rd. #04-01, PM Industrial Bldg.
+65.383.4400 FAX +65.383.4664
Singapore 368363

Extron Electronics Information

ExtronWEB™: www.extron.com
ExtronFAX™: 714.491.0192
24-hour access—worldwide!