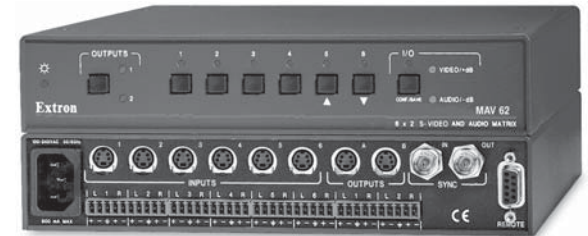


## User's Manual



## MAV 62 Composite Video and Audio MAV 62 S-video and Audio

### Matrix Audio and Video 6 Input/2 Output Matrix Switcher

# 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.

**Conservser 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.

**Eviter 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.

## Precaución

**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 la 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 reut 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 dagegestellt 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.

**Litium-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 puede ser eliminada.

**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.

# Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three 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, USA

### 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 Bldg.  
Singapore 368363

### Japan:

Extron Electronics, Japan  
Daisan DMJ Bldg. 6F,  
3-9-1 Kudan Minami  
Chiyoda-ku, Tokyo 102-0074  
Japan

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), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) 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.

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## MAV 62 Matrix Switcher

# Chapter One

## Introduction

About the MAV 62 Matrix Switchers

Features

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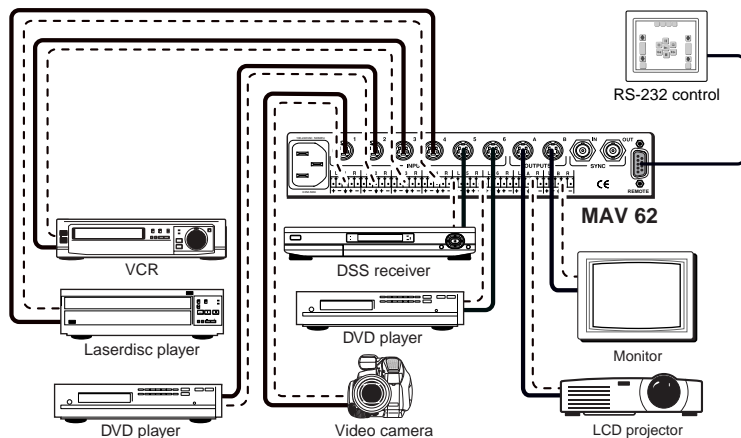
*All trademarks mentioned in this manual are the properties of their respective owners.*

## About the MAV 62 Matrix Switchers

The Extron MAV 62 family of matrix switchers consists of two models of 6-input, 2-output audio and video matrix switchers; the MAV 62 composite matrix routes composite video and the MAV 62 S-video matrix routes S-video. Both models route balanced or unbalanced stereo audio. The MAV 62 switchers distribute any of six video and/or audio inputs to either output or to both outputs. Any input can be switched to either or both outputs.

The switchers are compatible with NTSC 3.38 and 4.43, PAL, and SECAM video. When external sync is applied, video switching occurs during the vertical interval, providing glitch-free switching.

The switchers allow the user to switch between devices, such as a DSS receiver, a VHS or S-VHS VCR, a DVD player, or a camcorder, and output the image to one or two video recorders or displays, such as a data monitor or large screen projector (figure 1-1).



**Figure 1-1 — Typical MAV 62 switcher application**

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 ½-rack width switcher can be mounted to a standard Extron rack panel (part # 60-190-01). Each model has an internal 100VAC to 240VAC, 50/60 Hz, 15 watts, auto-switchable power supply that provides worldwide power compatibility.

## Features

### S-video model

**Inputs** — S-video switchers accept up to six S-video inputs on 4-pin mini DIN connectors.

**Outputs** — S-video switchers output two S-video signals on 4-pin mini DIN connectors.

### Composite video model

**Inputs** — Composite video switchers accept up to six composite video inputs on BNC female connectors.

**Outputs** — Composite video switchers output two composite video signals on BNC female connectors.

### All models

**Audio inputs** — Audio switchers accept up to six stereo audio inputs, balanced or unbalanced, on 3.5 mm, 5-pole captive screw terminals.

**Audio outputs** — Audio switchers output two stereo audio outputs, balanced or unbalanced, on 3.5 mm, 5-pole captive screw terminals.

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

**Front panel control** — The operator can select the inputs and outputs and set the audio gain and attenuation for each input using the front panel buttons.

**RS-232 control** — The operator can control the MAV 62 from a remote computer or other host using an RS-232 link on the Remote port. RS-232 control uses Extron's Simple Instruction Set™ (SIS™) or the Windows®-based control software.

**Simple Instruction Set** — The Simple Instruction Set program lets a host computer control the MAV 62 with simple commands.

**Windows control software** — Extron's Windows-based control software provides a graphic way to set up and control the MAV 62 with an on-screen control panel. It allows the operator to remotely select inputs, make audio adjustments, and store settings for future use.

## Introduction, cont'd

---

**Rack mount option** — The MAV 62 is 1U high and a half-rack width wide. It can be installed on a standard rack shelf using an Extron 1U Shelf Rack, part # 60-190-01.

**Auto-switching power supply** — An internal power supply with an IEC connector makes power cord connection easy. The power supply can be used internationally with any power input from 110 VAC to 240 VAC at 50 or 60 Hz and adapts automatically to the input type.



## MAV 62 Matrix Switcher

# Chapter Two

## Installation

Installation Overview

Mounting the switcher

Rear Panel Cabling

# Installation

## Installation Overview

To install and set up an Extron MAV 62 switcher for operation, follow these steps:

- 1 Turn off all of the equipment. Ensure that the video sources (DVD players, laserdisc players, VCRs, satellite receivers, or other devices) and the output display are all turned off and disconnected from the power source.
- 2 Mount the switcher. See *Mounting the switcher* in this chapter.
- 3 Attach the cables. See *Rear Panel Cabling* in this chapter.
- 4 Connect power cords and turn on the display devices and the input devices.
- 5 Set the audio gain and attenuation. See *Front Panel Controls and Indicators* in chapter 3.

## Mounting the switcher

1. For optional rack mounting, mount the MAV switcher on the left or right side of a 19" 1U Universal Rack Shelf (Extron part #60-190-01) (figure 2-1).
  - a. If feet were previously installed on the bottom of the case, remove them.
  - b. Mount the switcher on the rack shelf, using two 4-40 x 3/16 screws in opposite (diagonal) corners to secure the case to the shelf.
2. If desired, attach a false front panel, or a second ½-rack-width device to the other side of the shelf.
3. Attach the rack shelf to the rack using four 10-32 x ¾" bolts and four #10 beveled dress washers.

## Rear Panel Cabling

All connectors are on the rear panel. Depending on the model of the switcher, the type and layout of the connectors on the rear panel will vary. Figure 2-2 shows the rear panel of the MAV 62 S-video switcher. Figure 2-3 shows the rear panel of the MAV 62 composite switcher.

## Signal input connections

- 1 **S-video input connectors** — Connect S-video sources to these 4-pin mini DIN connectors.

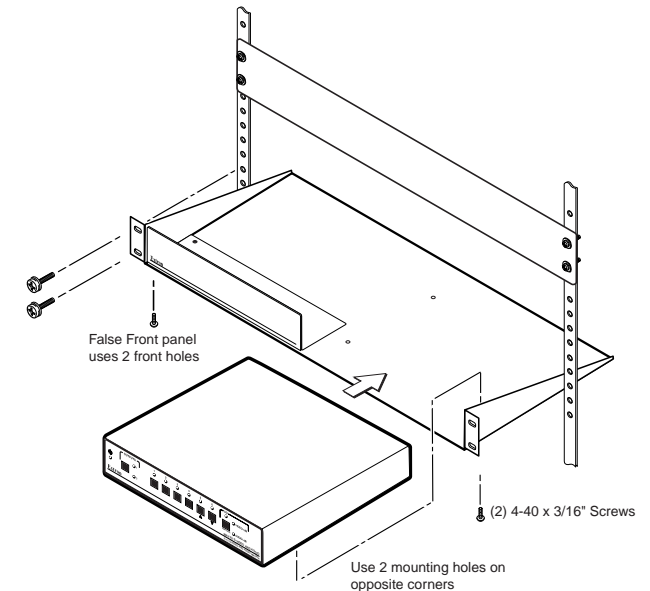


Figure 2-1 — Rack mounting the switcher

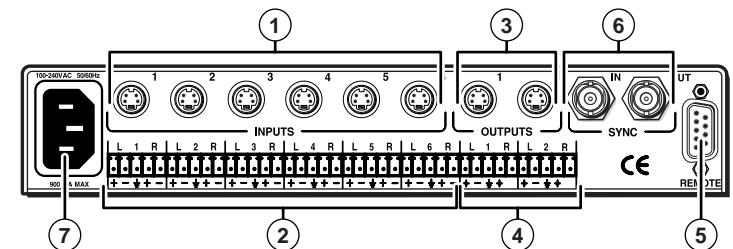


Figure 2-2 — MAV 62 S-video cabling

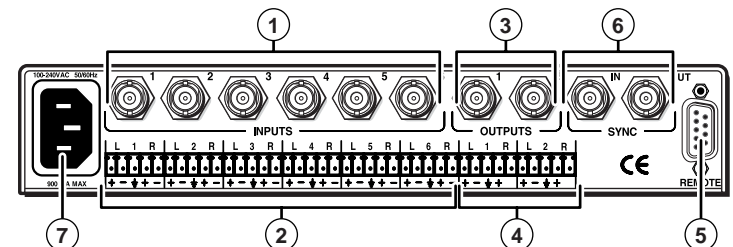


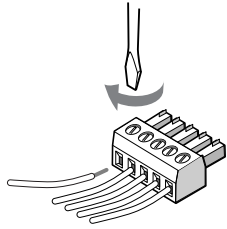
Figure 2-3 — MAV 62 composite video cabling



**Composite video input connectors** — Connect composite video sources to these female BNC connectors.

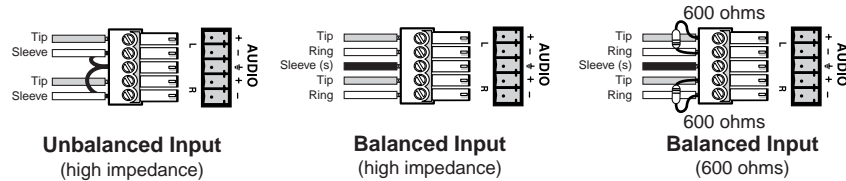
**NOTE** *The MAV 62 switchers do not alter the video signal in any way. The signal output by the switcher is in the same format as the input.*

② **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 MAV switcher, but you must supply the audio cable. See figure 2-4 to wire a connector for the appropriate input type and impedance level. High impedance is generally over 800 ohms.

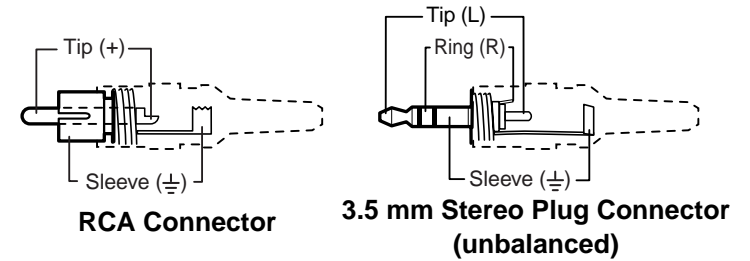
**CAUTION** *The captive screw connector can easily be inadvertently plugged partially into one receptacle and partially into an adjacent receptacle. This misconnection could damage the audio output circuits. Exercise care to ensure the captive screw connector is plugged into the desired input or output.*



**Figure 2-4 — Captive screw connector wiring for input**

**NOTE** *When making connections for the switcher from existing audio cables, see figure 2-5. 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 2-4 and figure 2-6.*

The audio level for each input can be individually set, via the front panel or RS-232, to ensure that the level on the output does not vary from input to input. See chapter 3, *Operation*, and chapter 4, *RS-232/Remote Control*, for details.



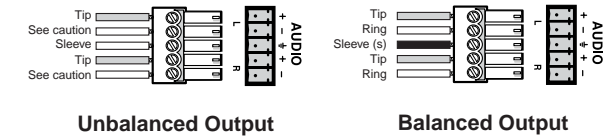
**Figure 2-5 — Phono audio connectors**

## Signal output connections

③ **S-video output connectors** — Connect S-video displays to these two 4-pin mini DIN connectors.

**Composite video output connectors** — Connect composite video displays to these two female BNC connectors.

④ **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 amplifier or powered speakers. See figure 2-6 to properly wire an output connector.



**Figure 2-6 — Captive screw connector wiring for audio output**

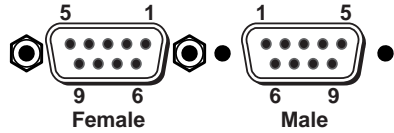
**CAUTION** *Connect the sleeve to ground (Gnd). Connecting the sleeve to a negative (-) terminal will damage the audio output circuits.*

By default, the audio output follows the video switch. Audio breakaway, commanded via the RS-232 link, allows the user to select from any one of the audio input sources. See chapter 4, *RS-232/Remote Control* for details on the RS-232 connection



## RS-232 connection

- ⑤ **Remote connector** — Connect a host device, such as a computer or a touch control panel, to the MAV switcher via this 9-pin D connector for remote control using the Simple Instruction Set (SIS) or the Extron graphical control program for Windows.



See chapter 4, *RS-232/Remote Control*, for definitions of the SIS commands and details on how to install and use the control software.

## External sync connection

When switching between inputs, the resulting image change should be seamless, or clean. The MAV switchers can use an external signal to synchronize switching during the vertical interval. Without the external sync locking feature, switching between inputs can result in a brief rolling (sync loss) or a brief change in the picture size.

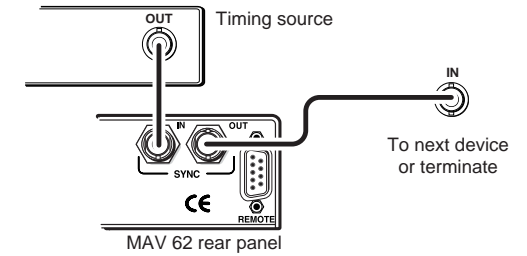
- ⑥ **External Sync In connector** — Connect an external sync signal to this BNC connection for genlocking the video signal in broadcast or other sync-critical applications.

**External Sync Out connector** — Connect any downstream equipment that requires genlocking to this BNC connector to route the external sync signal throughout the system in broadcast or other sync-critical applications.

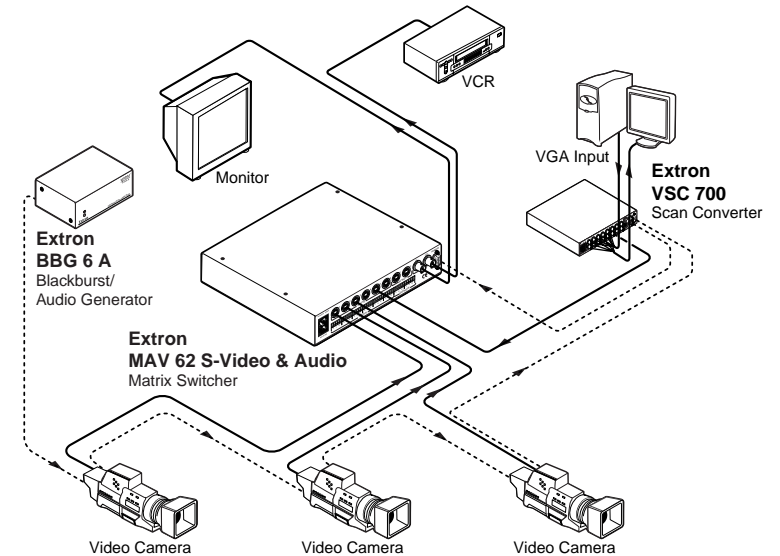
Figure 2-7 shows a basic external sync configuration. The Ext Sync In connector receives a timing signal. The Ext Sync Out connector allows the signal to be passed on to another video device, if required.

Figure 2-8 shows a typical configuration in which the timing source passes through three video cameras and a video scan converter before connecting to the switcher. This type of video camera is capable of synchronizing with the external timing source for video editing applications.

If no external sync timing source is connected to the switcher, switching occurs immediately.



**Figure 2-7 — Simple external sync connection example**



**Figure 2-8 — Multiple device external sync connection example**

## Power connection

- ⑦ **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.



# 3

## **Chapter Three**

### **Operation**

Front Panel Controls and Indicators

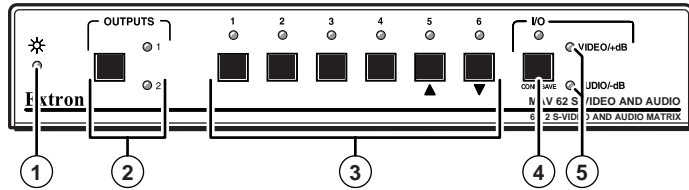
Front Panel Operations

Memory

Troubleshooting — If no image appears

## Front Panel Controls and Indicators

Figure 3-1 shows the controls and indicators on the front panel of the MAV 62 switcher.



**Figure 3-1 — MAV 62 controls and indicators**

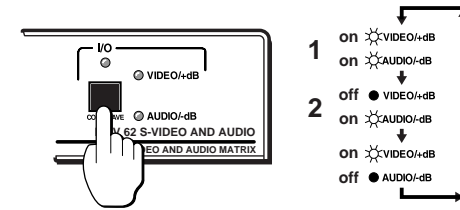
- ① **Power LED** — The Power LED lights to indicate power is on. If AC voltage is available, power is on. When power is first applied, all front panel LEDs flash to indicate that the power up sequence was accomplished satisfactorily.
- ② **Outputs button and LED** — The Outputs button toggles between output 1 and output 2. The Outputs LED indicates the selected output.
- ③ **Input buttons and LEDs** — The input 1 through input 6 buttons select an input for output. The input 1 through input 6 LEDs indicate the selected input.

As a secondary function, the input 5/▲ and input 6/▼ buttons increase and decrease the amount of audio gain for a selected input and the input 1 through 5 LEDs indicate the audio level of the selected input. See *Audio gain and attenuation* in this chapter.

- ④ **I/O configuration/save button and LED** — The I/O Conf/Save button has two functions, selecting between video and audio and selection of audio gain and attenuation mode. The I/O LED identifies which function is selected.

**Video and/or audio selection** — When pressed and released, the I/O button cycles through video and audio, audio only, and video only selected for configuration (figure 3-2). The I/O LED is off when this function is enabled, and the Video/+dB and Audio/-dB LEDs (5) report the video and audio input selection.

**Audio gain and attenuation mode** — When pressed and held, the I/O button selects or deselects audio gain and attenuation mode, in which the operator can adjust the audio gain and attenuation. The I/O LED blinks when this function is enabled, and the Video/+dB and Audio/-dB LEDs are part of the audio level display for the selected input. See *Audio gain and attenuation* in this chapter.



**Figure 3-2 — Video and/or audio selection**

- ⑤ **Video/+dB and Audio/-dB LEDs** — The function of the Video/+dB and Audio/-dB LEDs varies depending on whether the I/O Conf/Save button is selecting between video and audio or if the switcher is in audio gain and adjustment mode.

**Video and/or audio selection** — The Video/+dB and Audio/-dB LEDs indicate whether video, audio, or both are selected for display and/or selection. If audio is broken away and video and audio are selected for display, the Audio/-dB LED blinks.

**Audio gain and attenuation mode** — The Video/+dB and Audio/-dB LEDs indicate the polarity of the audio level setting. See *Audio gain and attenuation* in this chapter.

## Front Panel Operations

Plug in all system components and turn on the input devices (such as DVD players, laserdisc players, VCRs, and DSS receivers) and the output devices. Set the input devices to output video using each device's own operating instructions.

### Creating ties

A **Tie** is an input-to-output connection. An input can be **typed** to both outputs. (An output can never be **typed** to more than one input.)

Create video and/or audio ties using the front panel buttons as follows:

**NOTE** You cannot create a tie from the front panel if the MAV 62 is in audio gain and attenuation mode (if the I/O LED is blinking). If the I/O LED is blinking, press and hold the I/O Conf/Save button until the I/O LED goes out.

1. Press and release the Outputs button to select the desired output. The LED for the selected output lights.
2. Press and release the I/O Conf/Save button as necessary to select either video and audio (audio follow) or video or audio (audio breakaway).

- Press and release the button for the desired input. The LED for the selected input lights.

**NOTE** If audio and video are tied from different inputs (audio breakaway), and if you select video and audio for display, the Video/+dB LED and the LED for the selected video input light steadily and the Audio/-dB LED and the LED for the selected audio input blink (figure 3-3).



**Figure 3-3 — Audio breakaway indication**

A tie can also be created by an RS-232 device (see chapter 4, RS-232/Remote Control).

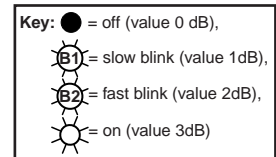
### Audio gain and attenuation

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

- Press and release an input button to select an input.
- Press and **hold** the I/O Conf/ Save button until the I/O LED begins to blink, then release the button. The input 1 through 5 LEDs display the audio level for the selected input and the Video/+dB and Audio/-dB LEDs display the polarity (+ or -).

Each input LED indicates 0dB when off, 1dB when blinking slowly, 2dB when blinking quickly, and 3dB when lit.

The Video/+dB LED indicates a positive (gain) level. The Audio/-dB LED indicates a negative (attenuation) level. Both LEDs on indicate 0dB.



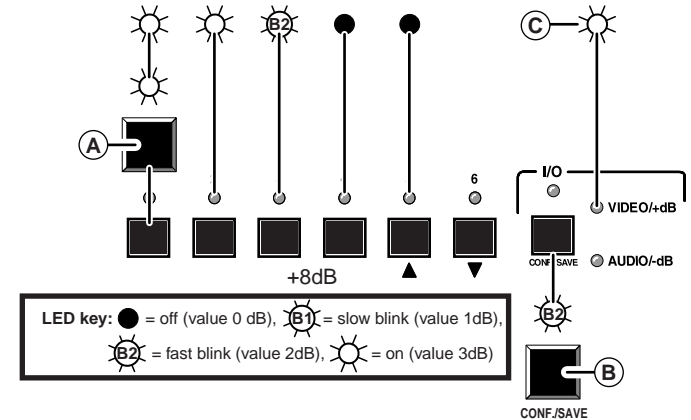
dB	1	2	3	4	5	-dB	+dB
+9	●	●	●	●	●	●	●
+8	●	●	ⓑ2	●	●	●	●
+7	●	●	ⓑ1	●	●	●	●
+6	●	●	●	●	●	●	●
+5	●	ⓑ2	●	●	●	●	●
+4	●	ⓑ1	●	●	●	●	●
+3	●	●	●	●	●	●	●
+2	●	ⓑ2	●	●	●	●	●
+1	●	ⓑ1	●	●	●	●	●
0	●	●	●	●	●	●	●
-1	ⓑ1	●	●	●	●	●	●
-2	ⓑ2	●	●	●	●	●	●
-3	●	●	●	●	●	●	●
-4	●	ⓑ1	●	●	●	●	●
-5	●	ⓑ2	●	●	●	●	●
-6	●	●	●	●	●	●	●
-7	●	●	ⓑ1	●	●	●	●
-8	●	●	ⓑ2	●	●	●	●
-9	●	●	●	●	●	●	●
-10	●	●	●	ⓑ1	●	●	●
-11	●	●	●	ⓑ2	●	●	●
-12	●	●	●	●	●	●	●
-13	●	●	●	●	ⓑ1	●	●
-14	●	●	●	●	ⓑ2	●	●
-15	●	●	●	●	●	●	●

- Press and release the ▲ and ▼ buttons to increase and decrease the audio level.
- Press and hold the I/O Conf/Save button until the I/O LED turns off to save the gain value in memory and exit the audio display and adjustment mode.

**NOTE** 1. There is one audio level setting per input. The 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.

### Viewing and adjusting an audio level

See figure 3-4 and figure 3-5 and the following steps for an example of viewing and adjusting the audio level on a MAV 62 switcher.



**Figure 3-4 — Viewing the audio level**

- Press and release an input button to select an input. The associated input LED lights.
- Press and **hold** the I/O Conf/Save button until the I/O LED starts blinking.
- The input 1 through 5 LEDs display the gain or attenuation value. The Video/+dB and Audio/-dB LEDs display the polarity. In Figure 3-4, the value +8dB is displayed.
- Press and release the ▼ button several times to decrease the audio level displayed in the input LEDs by 1dB per button push. Note the input LED, Video/+dB LED, and audio/-dB LED changes that occur each time the ▼ button is pressed and released. Figure 3-5 shows the result of pressing the ▼ button a

total of nine times to change the value to -1dB. Note that the Video/+dB LED has turned off and that the Audio/-dB LED is on to indicate a negative level.

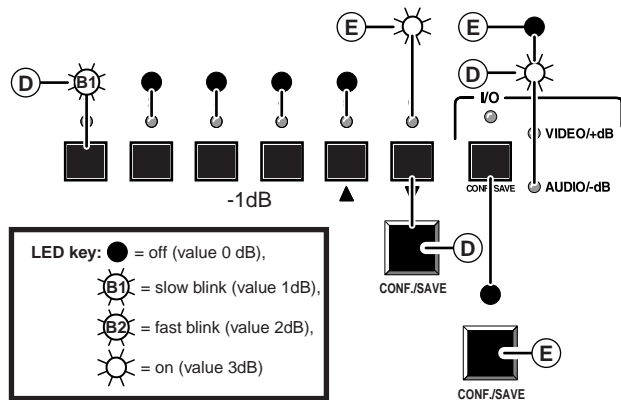


Figure 3-5 — Adjusting the audio level

- Ⓔ Press and **hold** the Audio button until the Audio LED turns off. The Video/+dB and Audio/-dB LEDs display video and/or audio selected, and the selected input and output LEDs light.

### Audio level reset

To reset the audio level to 0dB for all inputs, press and **hold** the Audio button for approximately 10 seconds. The Audio LED begins to blink and then turns off. Release the Audio button.

## Memory

Audio settings are saved in nonvolatile memory. When the switcher is powered off, the settings are retained. When the switcher is powered on, the saved settings are active. The ties are not saved; when the switcher is powered on it defaults to input 1 tied to output 1 and input 2 tied to output 2.

## Troubleshooting — If no image appears

1. Ensure that all devices are plugged in and powered on. The switcher is receiving power if the Power LED is lit.
2. Ensure an active input and output are selected on the MAV 62.
3. Ensure that the proper signal format is supplied.
4. Check the cabling and make corrections as necessary.
5. Call the Extron S<sup>3</sup> Sales & Technical Support Hotline if necessary.



# Chapter Four

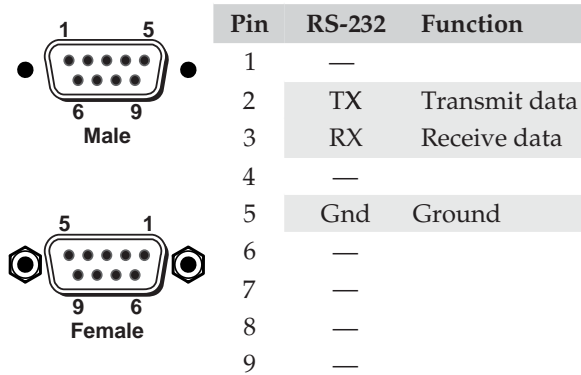
## RS-232/Remote Control

Simple Instruction Set Control

Windows-Based Program Control

## RS-232/Remote Control

The switcher's rear panel Remote connector (figure 4-1) can be connected to the serial port output of a host device. Remote communications with the switcher are via Extron's Simple Instruction Set or using Extron's Windows-based control program.



**Figure 4-1 — Remote connector pinout**

The RS-232 protocol of the rear panel RS-232/Remote connector is 9600 baud, 1 stop bit, no parity, and no flow control.

## Simple Instruction Set Control

### Host-to-interface communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command character sequence. When a command is valid, the switcher executes the command and sends a response to the host device. All responses from the switcher to the host end 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 or error condition, occurs, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below:

```
↵(C) Copyright 1996, Extron Electronics MAV 62, Vx.xx ↵  
↵Out1 Inn All ↵  
↵Out2 Inn All ↵
```

The switcher issues the copyright message and the input selected message when it first powers on. *Vx.xx* is the firmware version number. *Outx Inn All* identifies the currently selected ties, where *x* is the output number, *n* is the input number, and

*All* is both video and audio (the power-up default is video and audio output 1 tied to input 1 and video and audio output 2 tied to input 2). The switcher also sends the `↵Outx Inn↵` message whenever the selected input is changed using the front panel buttons.

### ↵Reconfig↵

The switcher initiates this message when there is a change in the audio gain setting for any input.

## Error responses

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

- ↵E01↵ - Invalid input channel number (out of range)
- ↵E10↵ - Invalid command
- ↵E12↵ - Invalid output number (out of range)
- ↵E13↵ - Invalid gain value (out of range)

## Timeout

Pauses of 10 seconds or longer between command ASCII characters result in a timeout. The command operation is aborted with no other indication.

## Using the command/response table

The command/response table is on the next page. Lower case letters are allowed in the command field only as indicated. Symbols are used throughout the table to represent variables in the command/response fields. Command and response examples are shown throughout the table. The ASCII to HEX conversion table is for use with the command/response table.



## Symbol definitions

- ↵ = CR/LF (carriage return/line feed) (0x0D 0A)
- = space
- [X1] = Input number                    1 through 6
- [X2] = Output number                 1 or 2
- [X3] = Input number                   0 through 6 (0 = muted output)
- [X4] = Gain/attenuation value       16 steps ±1dB per step
- [X5] = Gain/attenuation value       Numeric dB value, -15 to +9
- [X6] = Software version               x.xx

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

## Windows-Based Program Control

The Universal Switcher Control Program is compatible with Windows 3.1/3.11, Windows 95/98, Windows NT, Windows ME, and Windows 2000 and provides remote control of the input selection for each output (including audio breakaway) and audio gain and attenuation adjustments.

Updates to this program can be downloaded from the Extron Web site (<http://www.extron.com>).

## Installing the software

The program is contained on a single 3.5" diskette and can be run from the floppy drive, or it can be installed and run from the hard drive. To install the software on the hard drive, run setup.exe from the floppy disk and follow the screen instructions.


By default, the Windows installation creates a C:\UNIVSW folder and places two icons (Universal Switcher Control Program and Universal Switcher Help) into a group named "Extron Electronics".

## Command/response table for SIS commands

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
<b>Input selection</b>	Select video/audio input	[X3]*[X2]!	Tie input [X3] video and audio to output [X2].
	<i>Example:</i>	5*2!	Tie input 5 video and audio to output 2.
	Select video input only	[X3]*[X2]&	Tie input [X3] video to output [X2] (audio breakaway).
	Select audio input only	[X3]*[X2]\$	Tie input [X3] audio to output [X2] (audio breakaway).
<b>Input audio gain and attenuation</b>	Set gain	[X1]*[X4]G	Set gain for input [X1] to [X4]dB.
	<i>Example:</i>	4*3G	Set gain for input 4 to 3dB.
	Set attenuation	[X1]*[X4]g	Set attenuation for input [X1] to [X4]dB.
<b>View, information, part number, and firmware requests</b>	View gain or attenuation	V[X1]G	View gain for input [X1].
	<i>Example</i>	V4G	Attenuation for input 4 is set to -3dB.
	Information request	I/1	VI * [X1] • A1 * [X1] • V2 * [X1] • A2 * [X1] • QVER [X6] ↓
	<i>Example</i>	I	VI * 1 • A1 * 1 • V2 * 2 • A2 * 2 • QVER 1.23 ↓ Video input 1 tied to output 1; audio input 1 tied to output 1; video input 2 tied to output 2; audio input 2 tied to output 2; software version 1.23.
	Request for part number	N/n	60-419-01 = MAV 62 S-video.
Query software version	Q/q	QVER [X6] ↓	



### Using the software

1. To run the software, double click on the Universal Switcher Control Program icon in the Extron Electronics program group.  

2. Click on the comm port that is connected to the MAV 62's RS-232 port.
3. The Extron Universal Switcher Control Program window (figure 4-2) displays the selected inputs for each output and the audio gain for the selected audio inputs.

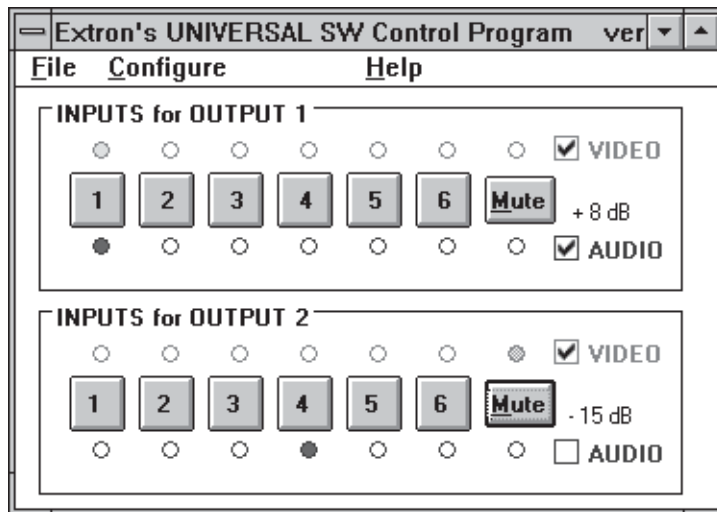
### Using the help system

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

- From the Extron Electronics program group, double-click on the Signal Enhancement Products Help icon.



- From within the Windows-based switcher control program, click on the Help entry on the task bar.
- From within the Windows-based switcher control program, press the F1 key.



**Figure 4-2 — Universal Switcher Control Program window**



## MAV 62 Matrix Switcher

# Appendix A

## Specifications, Accessories, and Part Numbers

Specifications

Included Parts

Accessories

Cables

# Specifications

## Video

Routing .....	6 x 2 matrix
Gain .....	Unity
Bandwidth .....	150 MHz (-3dB), fully loaded
	0 - 10 MHz ..... no more than 0.1dB to -0.1dB
	0 - 30 MHz ..... no more than 0.5dB to -0.5dB
Phase between I/Os .....	<1.28° at 3.58 MHz
Differential phase error .....	0.1% at 3.58 MHz and 4.43 MHz
Differential gain error .....	0.1° at 3.58 MHz and 4.43 MHz
Max. propagation of delay .....	5 ns typical (±1 ns)
Crosstalk .....	-50dB @ 5 MHz
Switching speed .....	200 ns (max.)

## Video input

Number/signal type	
MAV 62 Composite Video	6 composite video
MAV 62 S-video .....	6 S-video
Connectors	
MAV 62 Composite Video	6 BNC female
MAV 62 S-video .....	(6) 4-pin mini DIN female
Nominal level .....	1V p-p for S-video, and for composite video 0.3V p-p for C of S-video
Minimum/maximum levels .....	Analog: 0.5V to 2.0V p-p with no offset
Impedance .....	75 ohms
Return loss .....	<-30dB @ 5 MHz
Maximum DC offset .....	1.5V
External sync (genlock) .....	0.3V to 0.4V p-p

## Video output

Number/signal type	
MAV 62 Composite Video	2 composite video
MAV 62 S-video .....	2 S-video
Connectors	
MAV 62 Composite Video	2 BNC female
MAV 62 S-video .....	(2) 4-pin mini DIN female
Nominal level .....	1V p-p for S-video, and for composite video 0.3V p-p for C of S-video
Minimum/maximum levels .....	0.5V to 2V p-p
Impedance .....	75 ohms
Return loss .....	-30dB @ 5 MHz

DC offset .....	±5mV maximum with input at 0 offset
Switching type .....	Vertical interval

## Sync

Genlock connectors .....	2 BNC female
Standards .....	NTSC 3.58, NTSC 4.43, PAL, SECAM

## Audio

Routing .....	6 x 2 stereo matrix
Gain .....	Unbalanced output: 0dB; balanced output: +6dB
Frequency response .....	20 Hz to 20 kHz, ±0.05dB
THD + Noise .....	0.03% @ 1 kHz at rated nominal level
S/N .....	>90dB, output 21dBu, balanced, at rated maximum output
Crosstalk .....	<-80dB @ 1 kHz, fully loaded
Stereo channel separation .....	>80dB @ 1 kHz
CMRR .....	>75dB @ 20 Hz to 20 kHz

## Audio input

Number/signal type .....	6 stereo, balanced/unbalanced
Connectors .....	(6) 3.5 mm captive screw connectors, 5 pole
Impedance .....	>10 kohms unbalanced/balanced, DC coupled
Nominal level .....	-10dBV (316mV)
Maximum level .....	+19.5dBu, (balanced or unbalanced) at 1%THD+N
Input gain adjustment .....	-15dB to +9dB, adjustable per input via RS-232/422 or front panel

## Audio output

Number/signal type .....	2 stereo, balanced/unbalanced
Connectors .....	(2) 3.5 mm captive screw connectors, 5 pole
Impedance .....	50 ohms unbalanced, 100 ohms balanced
Gain error .....	±0.1dB 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

**NOTE** 0dBu = 0.775 volts (RMS).

## Accessories and Part Numbers

### Control/remote — switcher

Serial control port .....	RS-232, 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, autoswitchable, 15 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 optional 1U rack shelf, part #60-190-01
Enclosure type .....	Metal
Enclosure dimensions .....	1.75" H x 8.75" W x 9.5" D (1U high, half rack width) 4.4 cm H x 22.2 cm W x 24.1 cm D
Shipping/product weight .....	6 lbs (3 kg)/3.3 lbs (1.5 kg)
Vibration .....	ISTA/NSTA 1A in carton (International Safe Transit Association)
Listings .....	UL, CUL
Compliances .....	CE
MTBF .....	30,000 hours
Warranty .....	3 years parts and labor

**NOTE** Specifications are subject to change without notice.

### Included Parts

Included parts	Part number
MAV 62 6 x 2 video and audio matrix switcher	60-215-01
MAV 62 6 x 2 S-video and audio matrix switcher	60-358-02
MAV 62 matrix switcher label	
MAV 62 matrix switcher User's Guide	

### Accessories

Accessories	Part number
Extron 19" 1U Universal Rack Shelf	60-190-01
S-video male to 2 BNC adapter, female, 8"	26-353-02
S-video female to 2 BNC, male (various lengths)	26-353-xx
BNC male to RCA female adapter	10-264-01

### Cables

Extron's SVHS cable is suitable for S-video and Super High Resolution SHR 1 cable is suitable for composite video. Both these families of Extron cables have male connectors on both ends.

S-video Cable	Part number
SVHS 6' (6 feet/1.8 meters)	26-316-02
SVHS 12' (12 feet/3.7 meters)	26-316-03
SVHS 20' (20 feet/6.1 meters)	26-316-01
SVHS 30' (30 feet/9.1 meters)	26-316-04
SVHS 50' (50 feet/15.2 meters)	26-316-05
SVHS 75' (75 feet/22.9 meters)	26-316-06
SVHS 100' (100 feet/30.4 meters)	26-316-07

Super High Resolution Cable	Part number
SHR 1-3' (3 feet/0.9 meter)	26-383-01
SHR 1-6' (6 feet/1.8 meters)	26-383-12
SHR 1-12' (12 feet/3.7 meters)	26-383-07
SHR 1-25' (25 feet/7.6 meters)	26-383-04
SHR 1-50'HR (50 feet/15.2 meters)	26-383-05
SHR 1-75'HR (75 feet/22.9 meters)	26-383-06
SHR 1-100'HR (100 feet/30.5 meters)	26-383-03
SHR 1-150'HR (150 feet/45.0 meters)	26-383-08
SHR 1-200'HR (200 feet/60.0 meters)	26-383-09
SHR 1-250'HR (250 feet/75.0 meters)	26-383-10
SHR 1-300' (300 feet/91.4 meters)	26-383-11

## **Accessories and Part Numbers, cont'd**

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