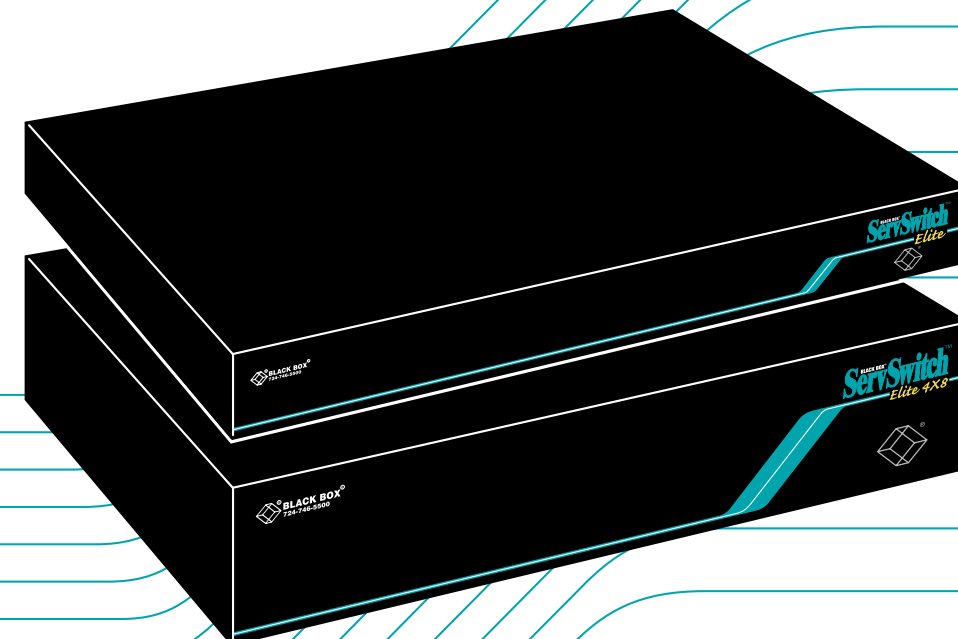


AUGUST 1998

BLACK BOX[®] ServSwitch[™] Elite

 **BLACK BOX**[®]
NETWORK SERVICES



KV7118SA
KV7148FA

Customer Support Information:

FREE tech support 24 hours a day, 7 days a week: Call 724-746-5500 or fax 724-746-0746.
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World-Wide Web: www.blackbox.com • E-mail: info@blackbox.com
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 **BLACK BOX**[®]
NETWORK SERVICES

Welcome to the ServSwitch™ Family!

Thank you for purchasing a BLACK BOX® ServSwitch™ Brand KVM switch! We appreciate your business, and we think you'll appreciate the many ways that your new ServSwitch keyboard/video/mouse switch will save you money, time, and effort.

That's because our ServSwitch family is all about breaking away from the traditional, expensive model of computer management. You know, the one-size-fits-all-even-if-it-doesn't model that says, "One computer gets one user station, no more, no less." Why not a single user station (monitor, keyboard, and mouse) for multiple computers—even computers of different platforms? Why not a pair of user stations, each of which can control multiple computers? Why not multiple user stations for the same computer?

With our ServSwitch products, there's no reason why not. We carry a broad line of robust solutions for all these applications. Do you have just two PCs, and need an economical alternative to keeping two monitors, keyboards, and mice on your desk? Or do you need to share dozens of computers, including a mix of IBM® PC, RS/6000®, Apple® Macintosh®, Sun Microsystems®, and SGI® compatibles among multiple users with different access levels? Does your switch have to sit solidly on a worktable and use regular everyday cables? Or does it have to be mounted in an equipment rack and use convenient many-to-one cables? No matter how large or small your setup is, no matter how simple or how complex, we're confident we have a ServSwitch system that's just right for you.

The ServSwitch™ family from Black Box—the one-stop answer for all your KVM-switching needs!

*

This manual will tell you all about your new ServSwitch Elite™ unit, including how to install, operate, and troubleshoot it. For an introduction to the ServSwitch Elite, see **Chapter 2**. The ServSwitch Elite product codes covered in this manual are:

KV7118SA
KV7148FA

This manual also includes information about the accessories with these product codes (each comes with its own installation guide if ordered separately):

KV7150A
KV7160A
KV7170A

RMK19E
RMK19E4

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Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Shielded cables must be used with this equipment to maintain compliance with radio frequency energy emission regulations and ensure a suitably high level of immunity to electromagnetic disturbances.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

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Dem Bundesamt für Zulassungen in der Telekommunikation wurde das Inverkehrbringen dieses Geräts angezeigt und die Berechtigung zur Überprüfung der Serie auf die Einhaltung der Bestimmungen eingeräumt.

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INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.

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1. Specifications

- Compliance** — EMI/RFI: CE; CISPER-A; FCC Part 15 Subpart B Class A, DOC Class/MDC classe A;
Electrical Safety: UL® 1950, cUL, TUV/GS, EN 60950
- Standards** — VGA, SVGA, and XGA video
- Compatibility** — Video: VGA, SVGA, XGA, GTX, or GTX1XX; also IBM RS/6000 and HP9000, although RS/6000 requires special cabling and RS/6000 and HP9000 sync-on-green applications require video adapters;
Keyboard: IBM PC/AT or PS/2 compatible (connecting a PC/AT keyboard requires an adapter such as our product code FA211);
Mouse: IBM PS/2 compatible two-button, Microsoft IntelliMouse, or Logitech™ PS/2 compatible 2- or 3-button
- Interfaces** — Video: VGA;
Keyboard and mouse: IBM PS/2 compatible
- Resolution** — Up to 1024 x 768 noninterlaced
- Maximum Distance** — 12 ft. (3.6 m) of extension cabling to any attached keyboard, monitor, and mouse;
50 ft. (15.2 m) of extension cabling to any attached CPU or cascaded ServSwitch Elite unit
- User Controls** — Keyboard/on-screen-menu commands;
(1) Rear-mounted rocker switch for power;
(1) Rear-mounted reset pushbutton;
KV7148FA only: (1) Internal DIP switch for port-contention handling
- Indicators** — On-screen windows and on-screen status-flag box

Connectors —	All rear-mounted: (1) RJ-45 female AUX connector; (1) IEC 320 male power inlet; (8) sets of: (1) HD15 female to CPU's video port; (2) 6-pin mini-DIN female: (1) to CPU's keyboard port, (1) to CPU's mouse port; For each computer port: (1) HD15 female to monitor; (2) 6-pin mini-DIN female: (1) to keyboard, (1) to mouse; KV7118SA: (1) set; KV7148FA: (4) sets
MTBF —	100,000 hours (calculated)
Temperature Tolerance —	50 to 104°F (10 to 40°C)
Humidity Tolerance —	5 to 90% noncondensing
Enclosure —	Cold-rolled steel
Power —	Input: 100 to 120 VAC or 200 to 240 VAC at 50 to 60 Hz from utility-power outlet, through detachable power cord and IEC 320 male inlet; Consumption: 30 watts maximum
Size —	KV7118SA: 1.8"H (1U) x 17"W x 10.8"D (4.4 x 43.2 x 27.4 cm); KV7148FA: 3.5"H (2U) x 17"W x 10.8"D (8.9 x 43.2 x 27.4 cm)
Weight —	KV7118SA: 9.1 lb. (4.1 kg); KV7148FA: 10.3 lb. (4.6 kg)

2. Introduction

2.1 Overview

The ServSwitch Elite is another great space- and effort-saving solution in the ServSwitch™ family of KVM switches from Black Box. It is 100% pin-for-pin compatible with the current generation of KVM switches by Compaq® and Hewlett-Packard®, so it's just right for adding to your existing Compaq or HP® environment.

It's also “modular” in that it can be configured and installed in different quantities and locations to suit the switching needs of a particular system. You can use multiple Switches to expand the system and connect user consoles to any of up to 64 computers.

With one single-user (our product code KV7118SA) ServSwitch Elite, users at a single user console (monitor, keyboard, and mouse station) can access any of as many as eight IBM® PC, IBM RISC System/6000® (RS/6000®), or HP9000® compatible computers. With one 4x8 (KV7148FA) model, users at up to four user consoles can access any of up to eight such computers. Both versions are enclosed in space-efficient cases to save space on your desktop or in your rack: 1U (1.8", 4.4 cm) high for the single-user model, 2U (3.5", 8.9 cm) high for the 4x8 model. And you can attach as many as eight “slave” units of either version to a “master” unit of either version to create a cascaded system with a capacity for 64 computers.

Switching between (also called “selecting”) computers is accomplished by typing a command at the keyboard. The selected computer receives characters typed at the keyboard and displays its video output on your monitor. You can use the mouse (which is optional) to interact with the graphic interface that the selected computer displays on the monitor. The ServSwitch Elite works independently of the attached computers' operating systems, so it doesn't matter if the computers are running different operating systems.

2.2 Key Features

2.2.1 FLEXIBILITY AND VERSATILITY

The ServSwitch Elite is compatible with several types of keyboards and mice, including:

- Industry-standard IBM PS/2® compatible keyboards and mice, including Logitech™ 2- and 3-button types;
- RS/6000 and HP9000 keyboards and mice;
- Microsoft® IntelliMouse® compatible mice;
- With the proper interface adapters, IBM PC/AT® compatible keyboards and serial mice (serial mice must be clearly identified as “mouse-port compatible”).

The Switch is also compatible with computers that have any of several major types of peripheral-I/O ports, including:

- PS/2 compatible (including RS/6000 and HP9000) keyboard and mouse ports, or,
- Through our PC/AT Serial Mouse Converter Kit (KV7150A), PC/AT keyboard ports and RS-232 serial mouse ports.

2.2.2 IMPROVED VIDEO QUALITY

The ServSwitch Elite supports standard display adapters and high-resolution video. Specifically, they support analog VGA, SVGA, and XGA video, as well as—with the RS/6000 (KV7160A) or HP9000 (KV7170A) Converter Kit respectively—RS/6000 or HP9000 video. The Switch can drive video at a maximum resolution of 1024 by 768 pixels across a 50-foot (15.2-m) video cable.

2.2.3 EASE OF USE AND MAINTENANCE

- **On-Screen Display**

The Switch's on-screen menus display a variety of system-related information on any console monitor, including power-up test data and configuration menus.

- **Programmable Scanning**

Scanning lets you observe system performance by sequentially displaying the video from any or all of the computers in the system on your monitor. Programmable scanning allows you to select which computers to include and to specify the duration of the connection.

- **Configuration NVRAM.**

The ServSwitch Elite uses nonvolatile RAM (NVRAM), which makes it easy to configure the Switch using commands entered from your keyboard. The NVRAM stores the resulting configuration until you decide to change the configuration settings again, even if the Switch is turned off or unplugged.

- **External Reset Switch**

If keyboard or mouse communication is disrupted, you can push this button to reinitialize the keyboard and mouse without turning the Switch off.

- **Password Protection**

Protects network resources by locking the keyboard and monitor.

- **Broadcasting**

Sends keyboard and/or mouse input to multiple computers simultaneously,

- **Remote Keypad (optional, special quote)**

A remote keypad for the ServSwitch Elite, consisting of a handheld controller attached to a 2-ft. (0.6-m) cable terminated with an RJ-45 plug, is available on a special-quote basis. When you connect it to the Switch's rear-panel AUX connector, it can take the place of the keyboard for the purpose of selecting computers on the Switch. Contact Black Box Technical Support for more information.

2.3 Possible System Configurations

ServSwitch Elites can be used in various system configurations to meet the needs of organizations operating computer networks of various sizes:

- *Single* Servswitch Elites can be used to connect up to eight computers
- *Multiple* Switches can be cascaded to connect up to 64 computers

2.3.1 SINGLE SERVSUWITCH ELITE SYSTEMS

In systems involving only one ServSwitch Elite, the keyboard, monitor, and mouse cables of each user console are connected directly to the Switch by their respective cables, as shown in Figure 2-1 (for the single-user model) and Figure 2-2 (for the 4x8 model) on the next page. The Switch then connects to the computers (as many as eight of them) through multiple sets of keyboard-, mouse-, and video-extension cables.

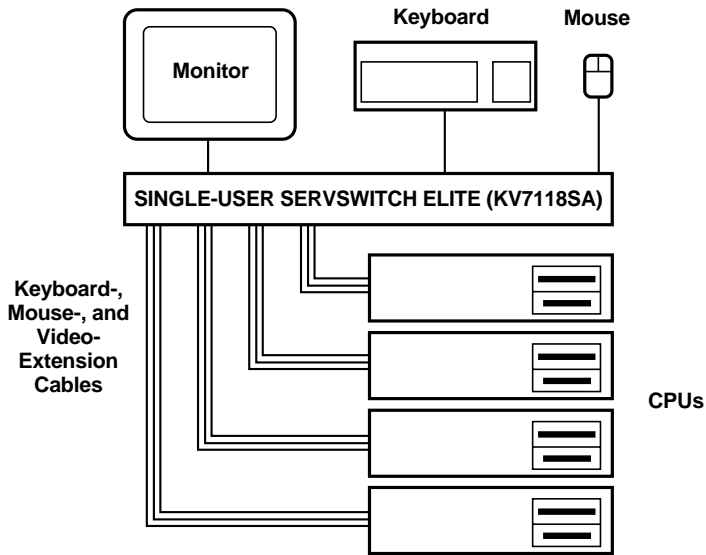


Figure 2-1. A system with one single-user Switch.

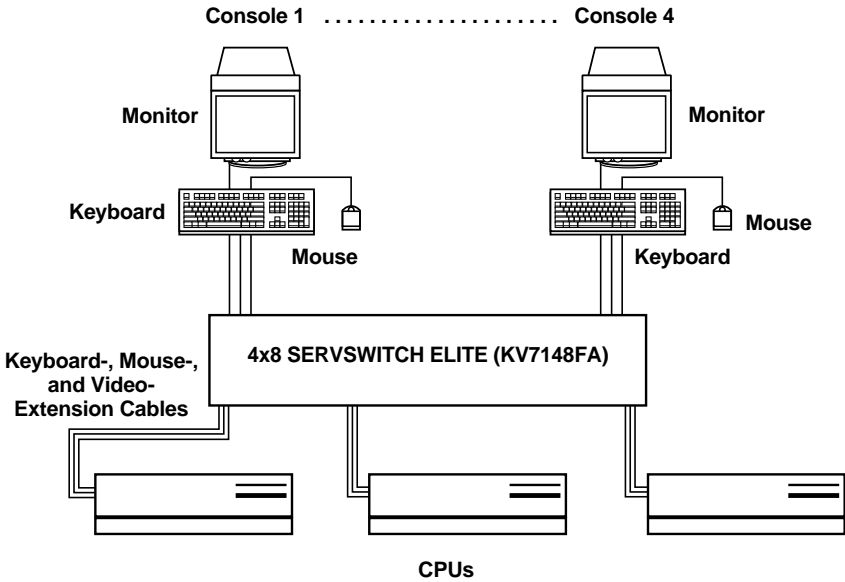


Figure 2-2. A single-4x8-Switch system.

2.3.2 MULTIPLE SERVSWITCH ELITE SYSTEMS

For systems with a large number of computers, ServSwitch Elites can be cascaded in a master/slave configuration to connect up to 64 computers. You can cascade Switches by connecting a “slave” (subsidiary) unit’s console port to one of the computer ports on the “master” (primary) unit, as shown in Figure 2-3 on the next page (for the single-user model) or Figure 2-4 on page 16 (for the 4x8 model). Multiple slave Switches can be cascaded from the master in this manner. For more information on cascaded systems, see **Section 3.4.2**.

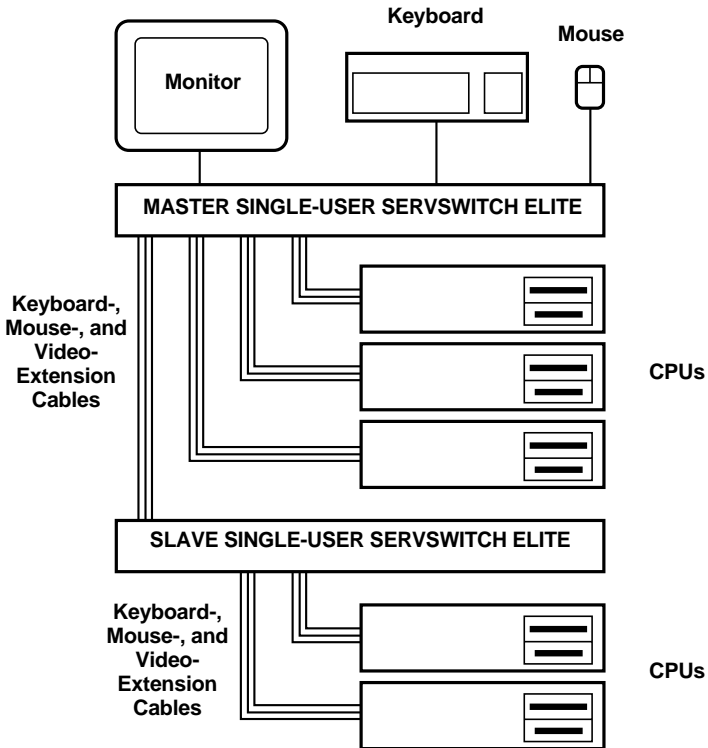


Figure 2-3. A cascaded “single-user”-Switch system.

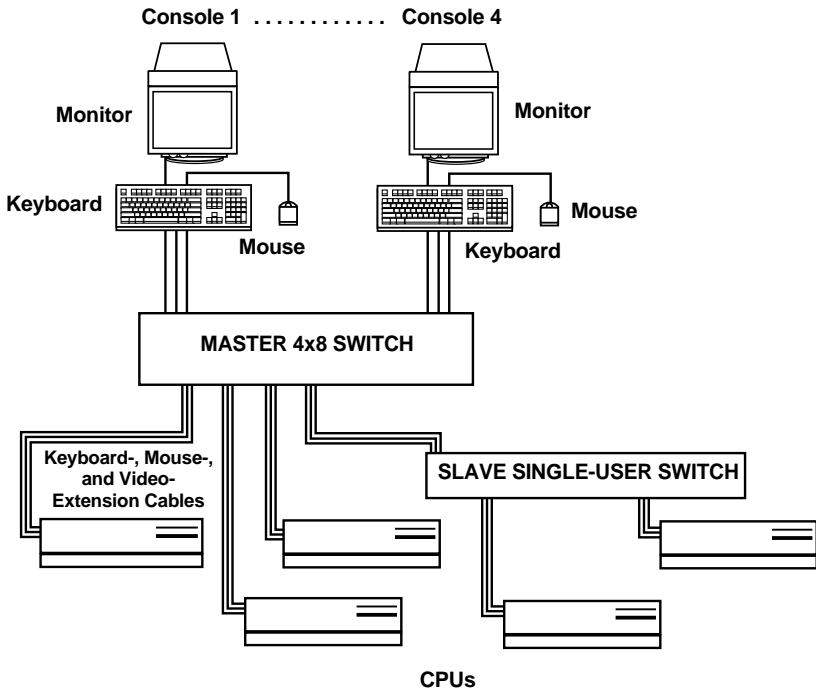


Figure 2-4. A cascaded system with a 4x8 Switch master.

3. Installation

3.1 Unpacking the Switch/The Complete Package

We ship the ServSwitch Elite in packaging designed to protect the system during shipping and handling. We recommend that you save the carton and packing materials in case you need to transport the Switch later.

The complete ServSwitch Elite system you should have received includes:

- The ServSwitch Elite main unit.
- Its power cord.
- This manual.

Please contact Black Box right away if anything is missing or arrived damaged.

3.2 Setting DIP Switch F (4x8 Model Only)

In its factory-default “cooperative” state, the ServSwitch Elite 4x8 (KV7148FA) always resolves port/slave contention in favor of existing connections: Even if a console is idle, no matter how long it has been in control of a computer port, no other console can connect either to *that port* (if the port’s on a single or master Switch) or to *any port on that unit* (if the port’s on a cascaded slave Switch). If another console tries to do so, the attempt is denied and the other console becomes “deselected” (not connected to any port). For example, suppose the user at Console A has selected computer port 3 and the user at Console B has selected port 6. If Console A’s user tries to select port 6, the request will be ignored and Console A will lose its connection to port 3, becoming disconnected from all of the computer ports until its user selects another.

If this is OK with you, go on to **Section 3.3**. But if you would like your 4x8 Switch to always resolve port/slave contention in favor of new connections instead—so that, in the above example, Console A would get port 6 and Console B would be displaced (not connected to any computer port, with its monitor blanked)—you need to move its DIP switch F to the “preemptive” setting. Following the first part of the procedure for upgrading the Switch’s firmware (see **Appendix B**), open the little panel on the bottom of the unit, exposing an area of the circuit board that contains a block of four DIP switches. Move the switch marked “1-1” on the left end of the block to the “ON” position and close the panel back up again. Your Switch is now set to “preemptive” mode, and will allow any console to select any computer port at any time, even if doing so disrupts previously established console-to-computer-port connections.

3.3 Rackmounting Switches (Optional)

Rackmount kits are available if you want to mount either model of the ServSwitch Elite in an EIA-standard 19" equipment rack. (This is especially useful if you want to attach the Switch to computers that are already mounted in the same or adjoining racks.) Figure 3-1 on the next page shows how to attach the mounting brackets from the RMK19E kit to the single-user Switch; Figure 3-2 on the next page shows how to attach the brackets from the RMK19E4 kit to the 4x8 Switch.

Follow safety measures when you install this equipment:

- Before you mount a Switch, make sure it is turned off and unplugged.
- Before you mount a Switch or other components in a rack cabinet, stabilize the cabinet in a permanent location. Start rackmounting your equipment at the bottom of the cabinet, then work your way to the top. Avoid uneven loading or overloading of cabinets.

CAUTION!

Do not exceed your cabinets' load rates. Overloading or uneven loading of a cabinet might result in shelf or cabinet failure, causing equipment damage and possibly personal injury.

When you do connect the ServSwitch Elite to a power source, connect it only to the type of power supply specified on the unit's housing. Do not exceed the current or voltage capacity of the Switch or of your site's circuits. Overloaded power sources, extension cords, etc., pose fire and shock hazards.

Take these steps to rackmount your Switch:

1. Line up the holes in the "long side" of the Kit's side brackets with the screwholes in the sides of the ServSwitch Elite.
2. With an Allen wrench, fasten the mounting brackets to the Switch using two of the included 8-32 x $\frac{3}{8}$ " button-head socket-cap screws per side.
3. Attach the included rack nut/holders to the mounting rail of the rack so that they are positioned on the inside of the cabinet.
4. Mount the Switch assembly to the cabinet by matching the holes or grooves on the "short side" of each bracket to an appropriate set of matching holes on your equipment rack, then inserting the included 10-32 x $\frac{1}{2}$ " Phillips truss-head screws through the holes or grooves in the bracket and the holes in the mounting rail, into the rack nut/holders, then tightening the screws to secure the assembly in place.

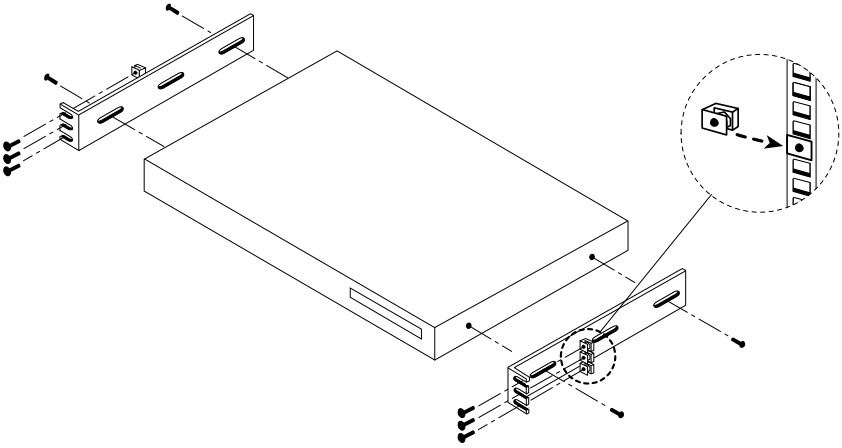


Figure 3-1. Rackmounting the single-user Switch with the RMK19E kit.

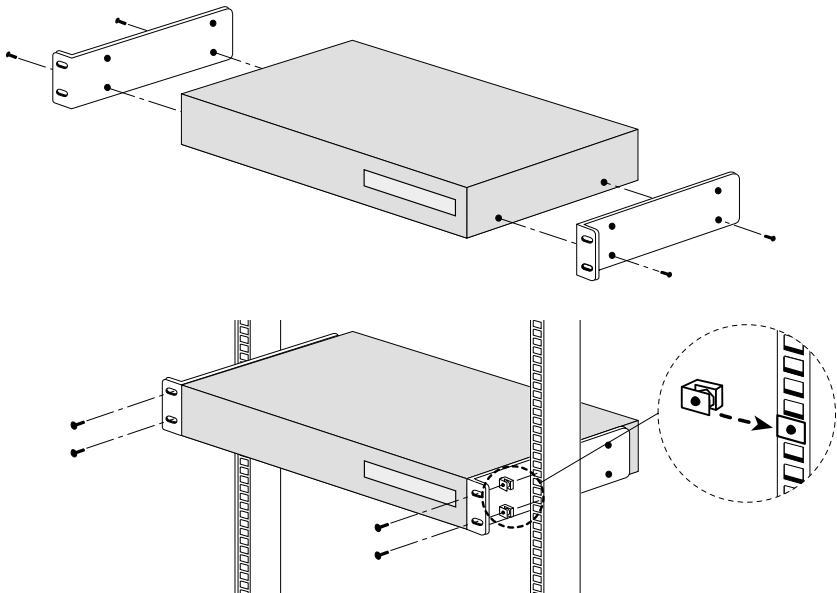


Figure 3-2. Rackmounting the 4x8 Switch with the RMK19E4 kit.

3.4 The Installation Procedure

Use the procedures described in the following subsections to install your ServSwitch Elite system. Refer to Figure 3-6 (for the single-user model) and Figure 3-7 (for the 4x8 model) on page 24 for general guidelines about where Switch components are and what they're for.

3.4.1 PLACING THE UNPOWERED SWITCHES

Before you do anything else, take these steps:

1. Make sure that each ServSwitch Elite you plan to install is turned off and unplugged.
2. Place any Switches that you haven't already rackmounted (see **Section 3.3**) in your desired location(s).

3.4.2 CASCADING SWITCHES (OPTIONAL)

A cascaded ServSwitch Elite system configuration allows the greatest flexibility and capacity. A cascaded configuration can include up to nine Switches and as many as 64 computers: In a cascaded system, the Switch connected to the main console(s) becomes the master or primary Switch; a layer of slave or secondary Switches are connected to the master Switch's computer ports. One master can accommodate eight slaves; thus, on a system with eight computers connected to each of the eight slaves, the users on the master Switch's console(s) can access 64 computers.

One thing you have to remember in a cascaded system is how the ports are numbered. The ServSwitch Elite system treats slaves' computer ports much like ports on a master or single Switch, but in the Switch's on-screen menus, the numbers of ports on a slave Switch are designated as "digit1-dash-digit2," where "digit1" is the slave's port on the master and "digit2" is the computer port on the slave. For example, a computer connected to Port 2 on a slave Switch which is connected to Port 1 on a master Switch would be numbered "1-2."

When you're finished installing your system, you might find it helpful to assign a name to each slave Switch (see **Sections 4.2.7** and **4.2.10**).

To connect a cascaded ServSwitch Elite system, take these steps, referring to Figures 3-4 and 3-5 on the next page:

1. Plug keyboard-, mouse-, and video-extension cables into a set of console connectors on the rear panel of the slave Switch. If your slave is a single-user unit, the keyboard, mouse, and monitor connectors will be the only console connectors you have to choose from. If your slave is a 4x8 unit, we recommend that you use the “Console A” connectors.

NOTE

You can have “local” consoles connected to the other console connectors on a slave 4x8 Switch. These consoles will contend with the master’s console(s) for access to the CPU ports on that slave, but they will not be able to access CPU ports on the master or on any other slaves.

2. Plug the other ends of your keyboard- and mouse-extension cables into the 6-pin mini-DIN sockets marked “K” and “M,” respectively, below one of the numbered port labels on the rear panel of the master Switch. Plug the other end of the video-extension cable into the associated HD15 female VGA connector. (You might want to bundle and label these cables for easy identification.)

For your cascade connections, we suggest that you start with CPU port “One” on the master Switch and use progressively higher-numbered ports as necessary.

NOTE

Later, once you’ve finished installing your ServSwitch Elite system and it’s operational, you’ll be able to connect a slave Switch to your master Switch while the system is running, if necessary. (This can be useful when you’re trying to isolate problems with minimum disruption to the system.) Because the master Switch interprets the keyboard connection as the slave Switch powering up, you must first connect the slave’s mouse- and video-extension cables, *then* the keyboard-extension cable.

This completes the physical installation of your cascade. Later, however, after the fully installed system has been powered up, you *must* tell the master Switch which of its CPU ports are hosting slave Switches instead of computers, or the system won’t work. To do so, follow the directions in **Section 4.2.10**. Also, you *must* configure your ServSwitch Elite system through the master Switch; see the note on page 30.

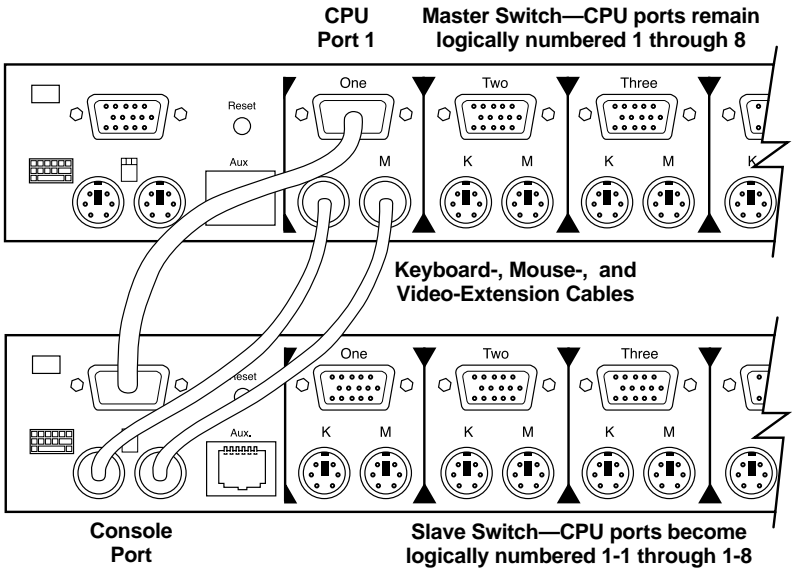


Figure 3-4. Cascaded ServSwitch Elite system with a single-user master Switch.

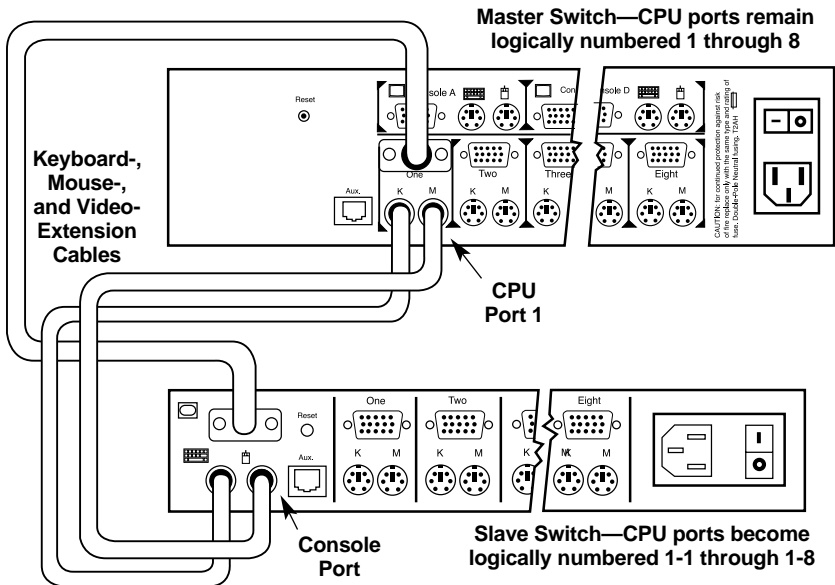


Figure 3-5. Cascaded ServSwitch Elite system with a 4x8 master Switch.

3.4.3 CONNECTING THE CONSOLE EQUIPMENT

Each ServSwitch Elite console consists of a keyboard, a mouse or trackball, and a monitor. Note that the keyboard and mouse ports on the rear panel of the Switch are PS/2 style 6-pin mini-DIN connectors, and each monitor port is a VGA/SVGA style HD15 connector. This means that to attach a standard console, all you need to do is plug the monitor, keyboard, and mouse directly into the Switch. On a single-user Switch, attach them to the monitor, keyboard, and mouse (console) connectors on the left end of the rear panel (see Figure 3-4 on the previous page); on a 4x8 Switch, attach them to the monitor, keyboard, and mouse connectors of “Console A,” “Console B,” “Console C,” or “Console D” on the top half of the rear panel (see Figure 3-5 on the previous page).

If you need to run farther to your console equipment than its native cables will reach, you can use our special three-in-one User-Extension Cables (not included, our product code EHN409) or regular male-to-female keyboard-, mouse-, and video-extension cables (not included) to connect a standard monitor, keyboard, and mouse to a console port on the Switch. (The design of the User-Extension Cable is shown in Figure 3-8 on page 25; it is available in a 10-foot [3-m] and 30-foot [9-m] lengths, but we don't recommend trying to run console-side extension cabling farther than 12 ft. [3.6 m] in ServSwitch Elite applications, because 18 ft. [5.5 m] is all the farther some keyboards and mice can be from the Switch and still operate.)

If any of your keyboard, mouse, or monitor cables have different connectors, some adapters and special cables are available from us as stock items and some are available on a special-quote basis (call Black Box Technical Support); some others you might have to get from the manufacturer of the peripheral you want to connect. For more information about keyboard-, mouse-, and video-connector pinouts, see **Appendix D**.

NOTES

Later, once you've finished installing your ServSwitch Elite system and it's operational, you'll be able to connect a mouse and/or keyboard to the Switch while the system is on. When you connect a new device, the Switch will recognize the device and configure it to match the settings of the currently selected computer. This will allow you to replace failed devices without having to restart the system.

Whenever you make these kinds of changes to the system, you should save its hardware-configuration settings. If you do not save the settings, they will be lost when the Switch loses power or is turned off. For more information, see Section 4.2.3.

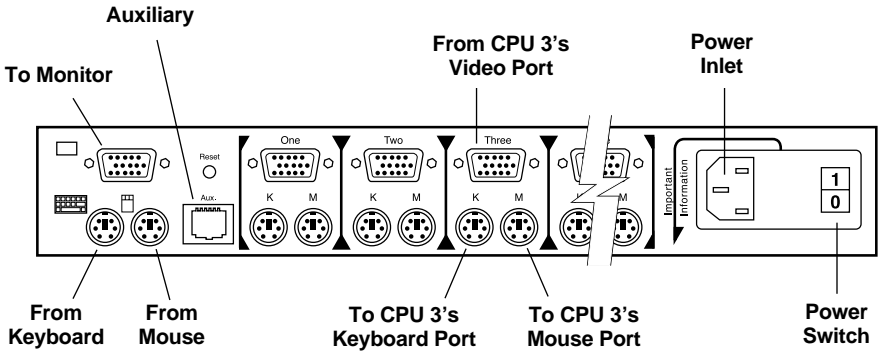


Figure 3-6. Rear panel of the single-user ServSwitch Elite.

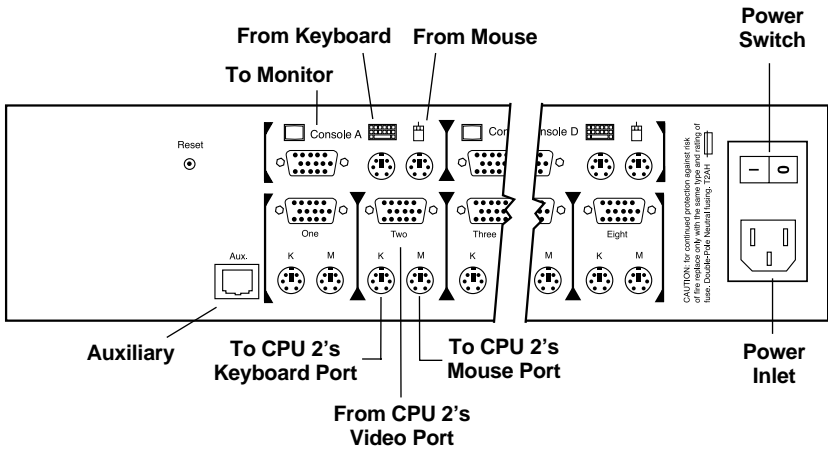


Figure 3-7. Rear panel of the ServSwitch Elite 4x8.

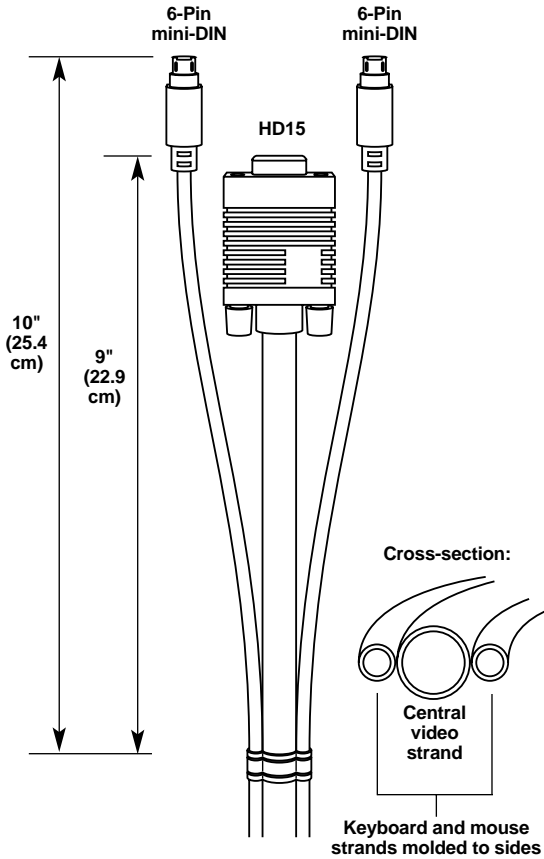


Figure 3-8. The User-Extension and CPU-Extension Cables.

3.4.4 CONNECTING THE COMPUTERS

Computer CPUs can be attached to the ServSwitch Elite through the CPU ports on its rear panel. Because the keyboard and mouse connectors on both the Switch and standard PCs are 6-pin mini-DIN female, and the video connectors on both the Switch and standard PCs are HD15 female, you can use our special three-in-one CPU-Extension Cables (not included, our product code EHN408) or regular male-to-male keyboard-, mouse-, and video-extension cables (not included) to connect your standard computer CPUs to the Switch. (The design of the CPU-Extension Cable is shown in Figure 3-8 on the previous page; it is available in 5-foot [1.5-m], 10-foot [3-m], 30-foot [10-m], and 50-ft. [15-m] lengths.) Take these steps:

1. Make sure all of the CPUs are turned OFF and unplugged.
2. Run the keyboard- and mouse-extension cables from the CPU's keyboard and mouse ports to the keyboard and mouse connectors (marked "K" and "M" respectively) of one of the Switch's CPU ports.
3. Run the video-extension cable from the CPU's video port to the video connector of the same CPU port on the Switch.

When you're finished, you might want to bundle and label these cables for easy identification.

If your computer has different keyboard-, mouse-, or video-port connectors, or if it uses sync-on-green video, some adapters and special cables are available from us as stock items and some are available on a special-quote basis (call Black Box Technical Support); some others you might have to get from the manufacturer of the computer you want to connect.

For example, if you want to connect a computer with a serial mouse port, you'll need to use the mouse adapter included with the KV7150A PC/AT Serial Mouse Converter Kit (KV7150A) to translate the PS/2 mouse protocol into RS-232 serial-mouse signals.

Or, if you want to connect an IBM RS/6000[®] with a 13W3 female video port, you'll need our EHN6000-ELITE cable set. It consists of a 12-ft. (3.7-m) video-extension cable with an HD15 male connector on the Switch end and a 13W3 male connector on the RS/6000 end, plus a pair of standard 6-pin mini-DIN male-to-male PS/2 style extension cables for the keyboard and mouse connections.

Thirdly, if you want to connect an RS/6000 workstation with a 3C3 female video port or an HP9000 workstation, both of which use the “composite sync on green” video format, you’ll need to use the video adapter included with the RS/6000 Converter Kit (KV7160A) or HP9000 Converter Kit (KV7170A) respectively. This adapter breaks the composite sync signal out onto separate horizontal and vertical sync lines, as is standard in regular PC video, and also improves the color balance. You’ll have to attach one of these adapters to the keyboard and video cables between the Switch and the workstation’s CPU.

For more information about how the Switch handles RS/6000 computers, see **Appendix C**. For more information about keyboard-, mouse-, and video-connector pinouts, see **Appendix D**.

NOTES

Later, once you’ve finished installing your ServSwitch Elite system and it’s operational, you’ll be able to connect additional computers to the Switch while the system is on. When you power up a newly connected CPU, the Switch will recognize it, and you should be able to select it right away.

Whenever you make these kinds of changes to the system, you should save its hardware-configuration settings. If you do not save the settings, they will be lost when the Switch loses power or is turned off. For more information, see Section 4.2.3.

3.4.5 CONNECTING THE POWER

To connect your ServSwitch Elite to AC power, first plug the IEC 320 outlet of the Switch’s power cord into the IEC 320 power inlet on the back of the Switch. Plug the other end—which should have a plug appropriate for your country or region on it—into an AC outlet on a UPS (uninterruptible power supply), which we highly recommend, or directly into a utility (mains) outlet if you don’t have a UPS.

Your Switch system should now be ready for operation. Go on to **Section 3.5**.

3.5 Initial Power-Up: Turning On the System

The first time you power up your ServSwitch Elite system, do it this way:

1. If you haven't already done so, attach its power cord to the Switch and plug the cord into a utility (mains) outlet.
2. Turn on your shared monitor(s).
3. Turn on the ServSwitch Elite by moving the power switch on its rear panel from the **O** position to the **|** position. This switch is on the far right end of the Switch's rear panel, as shown in Figures 3-6 and 3-7 on page 24.
4. Power up all of the attached CPUs (if you're not sure how, see the computers' manuals).

The Switch has to be turned on before the computers because the computers' keyboard, mouse, and video drivers send device-configuration requests/commands out of the corresponding ports. If the Switch is already ON, it can generate standard responses to these transmissions so that the PCs can boot normally even though they aren't physically connected to a keyboard, monitor, or mouse. If the Switch is OFF, however, the PCs will probably either hang, crash, or boot into an abnormal state.

NOTE

Later, once your ServSwitch Elite system is fully installed and operational, the Switch will help your computers recover from power outages. All of the computers attached to a Switch that are designed to reboot themselves automatically (without user intervention) will do so when power returns. The Switch generates responses to ensure that the reboot is successful and that the Switch is ready to switch between computers when regular operation resumes.

The Switch also does a few other things while it helps the PCs to boot:

1. It detects the device settings requested by the PC drivers. (You will probably want to save these settings to the Switch's NVRAM, so that it loads them automatically each time it powers up—see **Section 4.2.3**. You can manually change these NVRAM device settings later.)
2. It identifies the type of keyboard and mouse that are actually attached to each of its consoles and puts them in their default states.
3. It displays revision information about its hardware and firmware on the monitor screen.

4. The single-user ServSwitch Elite model automatically makes the startup-port selection: By default, the single-user model will switch its console to CPU port 1. The console's monitor should display the number of the CPU port it's connected to in a "status flag" box that looks something like this:



1

If the monitor doesn't display rev-level info or a status flag, check to make sure that it's plugged in, turned on, and connected to the Switch.

The 4x8 model will not make any automatic port selections; consoles A, B, C, and D will be deselected (not connected to any CPU port) at startup.

4. Operation and Configuration

Basic operation of the ServSwitch Elite is performed through the keyboard and a series of windows and menus that appear on the console display. Through these menus, you can perform functions such as switching between computers and checking port/computer status. You can get into these menus by pressing the [Print Screen] key; once you do, you can communicate directly with the Switch using your keyboard and monitor.

Table 4-1 on the next page shows how the ServSwitch Elite uses or affects certain keys on the shared keyboard, especially in regards to the on-screen menu. For more information on navigating the Switch's on-screen display, refer to **Appendix A**.

NOTE

In ServSwitch Elite systems, a single press of the [Print Screen] key—which on some computers (in ordinary conditions) causes the computer to capture or print out the current screen—is used to initiate the Switch's on-screen menus and port-switching process instead. To print a screen displayed by a computer attached to the system, you'll have to press [Print Screen] twice if the computer is attached to a single or master Switch or four times if the computer is attached to a slave Switch.

In cascaded systems, this [Print Screen] keypress activates the menus and port-switching functions at the master Switch, which controls switching, scanning, and configuration for the whole system. Even though in a cascaded system you can press [Print Screen] a second time to access these functions on the currently selected slave unit, we do not recommend doing this except for very limited slave-specific switching, status-checking, or scanning purposes. Do not change the factory-default configuration values on a slave; setting a master and slave to conflicting configuration values will cause the system to behave unpredictably.

See Table 4-2 on the next page for a list of the effects of repeatedly pressing [Print Screen] in ServSwitch Elite systems.

Table 4-1. Keyboard Commands/Effects of the ServSwitch Elite's On-Screen Display

Key(s)	Perform This Action or Are Affected This Way
[Print Screen]	If pressed once, opens the single or master Switch's on-screen display to the main <code>SERVSWITCH ELITE</code> menu. For effects if pressed more than once, see Table 3-2 below.
[F1]	If pressed at the <code>SERVSWITCH ELITE</code> menu, opens the <code>HELP</code> screen.
[F2]	If pressed at the <code>SERVSWITCH ELITE</code> menu, opens the <code>FUNCTIONS</code> menu.
Arrows ([↑] [↓] [←] [→])	If pressed at a menu, move the highlight bar through available selections, one at a time.
[PgUp], [PgDn] (page up, page down)	If pressed at the <code>SERVSWITCH ELITE</code> menu, move the highlight bar through available selections eight at a time.
[+] or [-]	If pressed while a value is highlighted, changes that value.
[Enter]	If pressed while at a menu, saves current or changed settings, returns to next-higher-level menu.
[Esc] (escape)	If pressed while typing in a new value, or at a subsidiary menu, aborts any changes in progress and returns to next-higher-level menu. If pressed at a high-level menu, exits the on-screen display.
Numeric keypad	Always in the numeric state, even if the Num Lock LED on the keyboard indicates otherwise.
[Caps Lock]	Disabled—use the [Shift] key to change case.

Table 4-2. Effects of the [Print Screen] Key

In this kind of system...	...here's what [Print Screen] does if you press it:
Single ServSwitch Elite	<i>Once:</i> Opens on-screen display. <i>Twice:</i> Clears the screen, then (if this function is enabled on the currently selected computer) captures or prints the screen.
Cascaded ServSwitch Elites	<i>Once:</i> Opens on-screen display on master Switch. <i>Twice:</i> Opens on-screen display on currently selected slave. <i>Three times:</i> Opens on-screen display on both master and slave. <i>Four times:</i> Clears the screen, then (if this function is enabled on the currently selected computer) captures or prints the screen.

4.1 Basic Operation

You can do basic things with the ServSwitch Elite, like switching between its computer ports or checking computer/port status, from the main window of the Switch's on-screen display. Pressing [Print Screen] brings this `SERVSWITCH ELITE` window up on screen; it lists all of the ports in the system, any associated computer names, and the status of each port. It can be organized by either port number or by name (see **Section 4.2.8**); You can scroll through the list with the up- and down-arrow ([↑] and [↓]) keys and, on large systems, the [Page Up] and [Page Down] keys. From this window, you can press [F2] to reach the `FUNCTIONS` menu or [F1] to see a very basic help screen. You can press [Esc] (escape) to exit the on-screen display, make the window disappear, and return to normal operation.

Figure 4-1 on page 34 shows you what this window would look like in a sample ServSwitch Elite 4x8 system. The actual appearance of this window in your system will depend on how you configure the window and how you name your computers. In its factory-default state, this window is ordered by port number and the computers are named "COMPUTER1," "COMPUTER2," and so on.

4.1.1 SWITCHING BETWEEN COMPUTERS

Switching computer ports electrically disconnects your console's keyboard, mouse, and monitor from the currently connected computer and connects them to the newly selected computer. In the ServSwitch Elite 4x8's factory-default "cooperative" state, if another console is already connected to the selected computer, or to any computer on the same slave Switch as your selected computer, you will not be connected to that computer; you will also become disconnected from your previously selected computer. (If you want new connections to displace existing connections instead, you can set the 4x8 model's internal DIP switch F to "preemptive"—see **Section 3.2**.) If you want to determine if a listed computer is up and running, or if some other console is already connected to any computer in the system, refer to **Section 4.1.2**.

You can switch from one computer port to another by typing commands at your keyboard:

1. Press and release the [Print Screen] key. The `SERVSWITCH ELITE` window will appear on screen in one of the two formats shown in the sample in Figure 4-1 on page 34. (Whether the computers are listed by port number or name is determined by the current setting of that particular menu attribute; see **Section 4.2.8**.)

2. Move the highlight bar to the computer you want to switch to in one of three ways:

- Use the up-arrow and down-arrow keys ([↑] and [↓]).
- *If the computers/slaves are listed in the `SERVSWITCH ELITE` window by their port numbers:* Press the number key(s) corresponding to the computer's port number. To enter port numbers for slave ports in cascaded systems (see **Section 3.3.2**), press the number key for the slave's master port, then the minus/dash ([−]) key, then the number key for the computer's slave port; if there isn't actually a slave unit on the master port you type in, the command will be immediately aborted.
- *If you have assigned a name to the computer or slave, and the computers/slaves are listed in the `SERVSWITCH ELITE` window by their assigned names (they will be shown in alphabetical order):* Type in the computer's/slave's name (or the first portion of its name) on the keyboard.

3. Press [Enter] to make your selection.

For example, to select the computer connected to Port 2 when the menu is ordered by port number, you would press and release [Print Screen], then [2], then [Enter].

Each time you switch computer ports, the Switch first reconfigures your keyboard and mouse to the operating state it has stored in its memory for the selected computer. For example, if that computer has [Caps Lock] on, the Switch will put the keyboard in [Caps Lock] mode. Only after it finishes making these configuration adjustments will the Switch pass the computer's video output through to your monitor.

When you are finished switching, the `SERVSWITCH ELITE` window automatically disappears from the display. As long as the status flag is enabled (see **Section 4.2.9**), the flag returns to the display to indicate the currently connected computer.

SERVSWITCH ELITE			
PORT	NAME		
1	MAGIC	+	
2	CENTRALOFC	+	B
3	SALES-C	+	D
4	SALES-B		
5	SALES-A	+	
6	DOWNTOWN	+	
7	FOREIGN	+	
8			
F1 HELP		F2 FUNCTIONS	

SERVSWITCH ELITE			
NAME	PORT		
CENTRALOFC	2	+	B
DOWNTOWN	6		
FOREIGN	7	+	
MAGIC	1	+	
SALES-A	5	+	
SALES-B	4		
SALES-C	3	+	D
	8		
F1 HELP		F2 FUNCTIONS	

Figure 4-1. The main SERVSWITCH ELITE menu for a hypothetical ServSwitch Elite 4x8 system with seven computers, ordered by port number (left) and name (right).

4.1.2 CHECKING PORT/COMPUTER STATUS

The `SERVSWITCH ELITE` window shows port/computer status, so you can determine:

- Which ports are currently active and whether they have a computer or a slave ServSwitch Elite connected, and
- Which ports are currently selected by different consoles in the system.

To check port/computer status:

1. Press [Print Screen]. The `SERVSWITCH ELITE` window appears on the display as shown in Figure 4-1 on the previous page. It lists the names, numbers, and statuses of all of the CPU ports in the system. The order in which the computers are listed, by port number or by name, is determined as described in **Section 4.2.8**.

The status is indicated by the characters in the two right-hand columns. The third column will contain one of these characters:

- Null (blank): Either the device attached to this port is turned off or unplugged, or there simply *isn't* any device attached.
- Plus (“+”): There is a powered computer attached to this port.
- The letter “X”: There is a powered slave Switch attached to this port.

Only the 4x8 units will have a fourth column in this window; if there is a character in this column, it will identify the console that has selected the computer (“A” for console A, “B” for console B, etc.).

2. Press [Esc] (escape) to exit the on-screen display and make it disappear.

4.2 Higher-Level Operation and Configuration: The FUNCTIONS Menu

The ServSwitch Elite can perform other functions that involve displaying system information, configuring the system, and troubleshooting the system. These functions, accessible through the on-screen **FUNCTIONS** menu, include:

*Operating functions (the **COMMANDS** submenu):*

- Scanning the computers in the system (see **Section 4.2.1**).
- Displaying ServSwitch Elite firmware version and settings (see **Section 4.2.2**).
- Saving system settings (see **Section 4.2.3**).
- Resetting the selected CPU's mouse and keyboard ports (see **Section 4.2.4**).
- *Single-user (KV7118SA) model only:* Broadcasting to multiple computers in the system (see **Section 4.2.5**).

*Configuration functions (the **SETUP** submenu):*

- Setting up a special scan pattern (see **Section 4.2.6**).
- Assigning unique names to the computers in the system (see **Section 4.2.7**).
- Listing computers by name or port number in the on-screen windows (see **Section 4.2.8**).
- Changing the position and color of the operation menus and windows (see **Section 4.2.8**).
- Changing the attributes of the status flag (see **Section 4.2.9**).
- Assigning a specific monitor type to a certain port (computer) (see **Section 4.2.10**).
- Setting security options for each Switch (see **Section 4.2.11**).

For information on how to make entries and selections in the menus, refer to **Appendix A**.

4.2.1 SCANNING THE COMPUTERS IN THE SYSTEM

When you place it in “scan mode,” the ServSwitch Elite automatically switches the video connection sequentially from port to port (computer to computer), so you can observe the state of any or all of the computers in the system.

Instead of sequential uniform scanning, you can set up a scan mode that includes specific computers in, or excludes them from, the scan. For this custom scan mode, you can specify that the computers be scanned in a given sequence, and for variable durations. Refer to **Section 4.2.6**.

To place the Switch in the scan mode, take these steps:

1. Press [Print Screen]. The `SERVSUITCH ELITE` window appears.
2. Press [F2] and the `FUNCTIONS` window appears. The Commands menu will be displayed and its first entry (`SCAN`) will be highlighted.
3. Press [Enter]. At this point, the Switch enters scan mode and the display returns to the status flag. You can press [Esc] (escape) at any time prior to pressing [Enter] to cancel the operation.

To get out of scan mode, press any key on the keyboard or move the mouse. The scan stops at the currently connected computer.

On the ServSwitch Elite 4x8 (KV7148FA), each of the four consoles can scan the system independently. You can scan computer ports controlled by other consoles if those ports are on a master or single Switch; however, if you try to scan *any* port on the same slave Switch as a port controlled by another console, or if you try to stop the scan at a port controlled by another console, the Switch will react in one of two ways depending on the setting of DIP switch F (see **Section 3.2**):

- In the factory-default “cooperative” setting, the Switch will not let you stop your scan on any computer port controlled by another console. You will instead be “deselected”—not connected to any port, with video blanked—until you select a different port. If you try to scan any port on the same slave Switch as a port controlled by another console, you will not see anything (the video will be blank).
- In the “preemptive” setting, if you stop your scan on a port controlled by another console—or even if you scan *any* port on the same slave Switch as a port controlled by another console—the Switch will connect you to that port and will deselect the console that was in control of that port, or the other port on that slave—instead.

4.2.2 DISPLAYING VERSION INFORMATION AND DEVICE SETTINGS

To make troubleshooting and supporting the system easier, the ServSwitch Elite's firmware-version number can be displayed along with specific keyboard and mouse information for the currently selected computer. To display this information, take these steps:

1. Press [Print Screen]. The `SERVSWITCH ELITE` window appears.
2. Press [F2] and the `FUNCTIONS` window appears. The Commands menu will be displayed.
3. Using the up and down arrow ([↑] and [↓]) keys, move the highlight bar to `VERSION` and press [Enter]; the `VERSION` window will appear:

VERSION	
FIRMWARE	X.X.X BB
HARDWARE	X.X 8PORT
DIP SWITCH F	COOPERATIVE
PORT 1	MAGIC
KEYBOARD	MOUSE
ENABLED	ENABLED
RATE 2C	RATE 100
LEDS 2	RES 2
MODE 2	
TYPE 101	TYPE GEN

Figure 4-2. The VERSION window.

In this window, the keyboard information includes enabled/disabled, typematic rate, LED settings, scan mode, and keyboard type. The mouse information includes enabled/disabled, sample rate, resolution, and mouse type. Note that the entry for `DIP SWITCH F` will appear on both single-user and 4x8 units, but only 4x8 units will show a value for the switch's setting (`COOPERATIVE` or `PREEMPTIVE`) because the setting is irrelevant on single-user units.

4. Press [Esc] (escape) to exit the Version window.

4.2.3 SAVING THE HARDWARE CONFIGURATION

Whenever computers are added to or removed from the system, or whenever there is a change in any keyboard or mouse, the hardware-configuration settings should be saved to the ServSwitch Elite's nonvolatile memory. If the settings are not saved, they will be lost whenever Switch power is lost or turned off.

CAUTION!

If settings are not saved and Switch power is lost, it might be necessary to reboot each computer in the system to reestablish keyboard and mouse communication.

To save the Switch's configuration settings to NVRAM, take these steps:

1. Press [Print Screen]. The `SERVSWITCH ELITE` window appears on the display.
2. Press [F2] and the `FUNCTIONS` window appears. The Commands menu will be displayed.
3. Using the up- and down-arrow ([↑] and [↓]) keys, move the highlight bar to `SNAPSHOT`.
4. Press [Enter]. The hardware settings are now saved to memory.

4.2.4 RESETTING THE MOUSE AND KEYBOARD PORTS

If you want to try to restore the correct keyboard and mouse settings for the selected computer, you can reset the CPU's mouse and keyboard ports by taking these steps:

1. Press [Print Screen]. The `SERVSWITCH ELITE` window appears on the display.
2. Press [F2] and the `FUNCTIONS` window appears. The Commands menu will be displayed.
3. Using the up- and down-arrow ([↑] and [↓]) keys, move the highlight bar to `RESET`.
4. Press [Enter]. The default settings of the mouse and keyboard ports have now been restored.

4.2.5 USING BROADCAST MODE (SINGLE-USER MODEL ONLY)

With the single-user (KV7118SA) ServSwitch Elite's "broadcasting" feature, you can simultaneously control more than one computer in a system. (At least the Switch *attempts* to send keystrokes and mouse commands to the selected computers simultaneously; however, some computers might inhibit and thus delay the transmission.) This feature is useful when you want to make sure that all selected computers receive identical input. For each computer receiving the broadcast, you can choose to broadcast keystrokes, mouse movements, or both.

NOTES

For all computers receiving a broadcast to interpret commands identically, the keyboard and mouse states for the computers must be identical. Specifically, the [Caps Lock] and [Num Lock] modes should be the same on all keyboards. For the mouse to work accurately, all systems must have identical mouse drivers, identical desktops, and identical video resolutions. In addition, the mouse must be in exactly the same place on all screens. Because these conditions are extremely difficult to achieve, broadcasting mouse movement to multiple systems might have unpredictable results.

While broadcast mode is on, the status flag will indicate it with a "broadcast symbol" to the right of the port number or name:



You will use either of two procedures to select a group of ports and broadcast to it, depending on whether you want to include any slave ports. If you want to broadcast to *ports on a single or master Switch only*, take these steps:

1. Press [Print Screen]. The `SERVSWITCH ELITE` window appears.
2. Press [F2] and the `FUNCTIONS` window appears. The `Commands` menu will be displayed. Press the right arrow ([→]) key to move the highlight bar so that the `Setup` menu is displayed.
3. Using the down-arrow ([↓]) key, move the highlight bar to `BROADCAST` in the `Setup` menu.

4. Press [Enter]. The BROADCAST SETTINGS window appears:

BROADCAST SETTINGS		
PORT	KEYBOARD	MOUSE
1	YES	YES
2	NO	NO
3	YES	NO
4	YES	YES
5	NO	NO
6	NO	YES
7	YES	YES
8	YES	YES

Figure 4-3. The BROADCAST SETTINGS window.

- For each port listed, select whether or not you want the computer to receive broadcast keyboard or mouse data. Use the up- and down-arrow ([↑] and [↓]) keys to move up and down the port list, the right- and left-arrow ([←] and [→]) keys to move back and forth between the columns, and the [+] or [-] key to toggle between “YES” and “NO.”
- Press [Enter] to save the settings. You will be returned to the FUNCTIONS window.
- Press the left-arrow ([←]) key to move the highlight bar so that the Commands menu is displayed. Using the down-arrow ([↓]) key, move the highlight bar to BROADCAST in the Commands menu.
- Press [Enter] to activate broadcast mode. The on-screen display will disappear. Type in the keyboard data and/or make the mouse movements you want to broadcast. When you’re finished, press [Print Screen], then [F2], then scroll down to BROADCAST in the Commands menu and press [Enter] to turn broadcast mode off.

If you want to broadcast to *a set of ports that includes slave ports*, you have to set up individual broadcast groups on each Switch. Take these steps:

- Follow steps 1 through 6 of the “single or master Switch only” procedure to select all of the ports on the master Switch that are occupied by computers you want to broadcast to.
- Press [Print Screen]. The master Switch’s SERVSWITCH ELITE window appears.

3. Using the up- and down-arrow ([↑] and [↓]) keys, move the highlight bar to the number of the master port (shown here as “1-1,” “2-1,” and so on) that hosts a slave with a port you want to broadcast to.
4. Press [Enter] to select that slave. The master Switch’s `SERVSWITCH ELITE` window disappears.
5. Press [Print Screen] twice. The slave Switch’s `SERVSWITCH ELITE` window appears.
6. Press [F2] and the `FUNCTIONS` window appears. The Commands menu will be displayed. Press the right arrow ([→]) key to move the highlight bar so that the Setup menu is displayed.
7. Using the down-arrow ([↓]) key, move the highlight bar to `BROADCAST` in the slave Switch’s Setup menu.
8. Press [Enter]. The `BROADCAST SETTINGS` window appears, like the one shown in Figure 4-3 on the previous page.
9. For each port listed, select whether or not you want the computer to receive broadcast keyboard or mouse data. Use the up- and down-arrow ([↑] and [↓]) keys to move up and down the port list, the right- and left-arrow ([←] and [→]) keys to move back and forth between the columns, and the [+] or [-] key to toggle between “YES” and “NO.”
10. Press [Enter] to save the settings.
11. Repeat steps 2 through 10 for every other slave Switch with a port you want in the broadcast group.
12. Press [Print Screen]. The master Switch’s `SERVSWITCH ELITE` window appears again.
13. Press [F2] and the `FUNCTIONS` window appears. Using the down-arrow ([↓]) key, move the highlight bar to `BROADCAST` in the master Switch’s Commands menu.
14. Press [Enter] to activate broadcast mode. The on-screen display will disappear. Type in the keyboard data and/or make the mouse movements you want to broadcast. When you’re finished, press [Print Screen], then [F2], then scroll down to `BROADCAST` in the master Switch’s Commands menu and press [Enter] to turn broadcast mode off.

4.2.6 SETTING A SCAN PATTERN

While the ServSwitch Elite is equipped with a standard scan routine for sequentially connecting each computer to the monitor, keyboard, and mouse (refer to **Section 4.2.1**), you can configure a “custom scan” of any or all of the computers that follows a particular pattern or sequence. To create a custom scan pattern (which, on a 4x8 Switch, you can do independently for each console), take these steps:

1. Press [Print Screen]. The `SERVSWITCH ELITE` window appears on the display.
2. Press [F2] and the `FUNCTIONS` window appears. The Commands menu will be displayed. Press the right arrow ([→]) key to move the highlight bar so that the Setup menu is displayed and its first entry (`SCAN`) is highlighted.
3. Press [Enter]. The `SCAN PATTERN SETUP` window appears with the first port position (or computer name) highlighted. In the sample window shown in Figure 4-4 below, the Switch’s ports are ordered by port number; if you have the ports ordered by name instead (see **Section 4.2.8**), the `PORT` and `NAME` columns will be reversed in position.

SCAN PATTERN SETUP		
PORT	SEC	NAME
6	20	DOWNTOWN
5	20	SALES-A
4	10	SALES-B
1	10	MAGIC

F2 FOR DEFAULTS

Figure 4-4. The SCAN PATTERN SETUP window.

4. Using the keyboard keys, type in the port number, or the first few letters of the name, of the first computer to be included in the scan. (See **Section 4.2.7** for more information about assigning names to computer ports.) This computer/port will appear on this line.

5. Press the [Tab] or right-arrow ([→]) key to move the highlight bar to the SEC column and use the keyboard keys to enter a time value in seconds (up to 255) that you want this computer to be connected to the console (viewable on the monitor) before the Switch switches to the next computer in the scan.

To delete a single port from the list, enter “0” (zero) seconds here. To delete a whole set of unwanted ports at the end of the scan list, which is where most of them end up after you’ve brought together your list of desired ports anyway, place the highlight bar on the topmost port to be removed and press the [Delete] key (not the [Del] key on the numeric keypad). The highlighted port and all ports below it will be removed from the list.

6. Press the down-arrow ([↓]) key to move the highlight bar to the next line.

7. Repeat steps 5 through 7 as necessary for your remaining computers.

8. When you’ve finished setting the scan pattern, press [Enter]. The new scan pattern supersedes the standard scan or any previous custom scan. You can press [Esc] (escape) at any time prior to pressing [Enter] to retain the previous scan pattern. Pressing the [F2] key will return all PORT and SEC values to their factory defaults.

To exit the on-screen menus in order to test your new scan pattern, press [Esc].

4.2.7 ASSIGNING UNIQUE NAMES TO THE COMPUTERS AND SLAVES IN THE SYSTEM

It might be helpful to assign unique names to each computer and slave in your ServSwitch Elite system as a means of easy identification. For example, in a network environment, the names can be the same as those assigned in the network for each computer. Assign names as follows:

1. Press [Print Screen]. The `SERVSWITCH ELITE` window appears on the display.
2. Press [F2] and the `FUNCTIONS` window appears. The Commands menu will be displayed. Press the right arrow ([→]) key to move the highlight bar so that the Setup menu is displayed.
3. Using the up- and down-arrow ([↑] and [↓]) keys, move the highlight bar to `NAMES`.
4. Press [Enter]. The `PORT NAMING` window appears:

PORT NAMING	
PORT	NAME
1	MAGIC
2	CENTRALOFC
3	SALES-C
4	SALES-B
5	SALES-A
6	DOWNTOWN
7	FOREIGN
8	

Figure 4-5. The PORT NAMING window.

5. Using the up- and down-arrow ([↑] and [↓]) keys, move the highlight bar to the `PORT` entry that you want to give a name or change the name of. Type in a name up to 12 alphanumeric characters long; valid characters are the uppercase letters “A” through “Z”—you can type lowercase letters, but they’ll automatically be converted to uppercase—the digits “0” through “9,” and the “-” (dash, hyphen, minus) character. Press [Backspace] to delete an incorrect entry or an entry for a device that has been removed from the system. Repeat this step as necessary.

NOTE

Before you can name computers attached to a slave Switch, you have to tell the master Switch that the slave is, in fact, a slave; see Section 4.2.10.

6. Press [Enter] to save the computer name(s) in NVRAM. You can press [Esc] (escape) at any time prior to pressing [Enter] to cancel the operation.

4.2.8 CHANGING THE MENU ATTRIBUTES

The menus and windows displayed on the monitor can be altered in visual appearance to suit the particular use of the system (and on a 4x8 Switch, you can do so independently for each console). Certain adjustments can be made to the menus so that:

- The menu is positioned in a convenient location on the display.
- The computers are listed by port or by name, whichever is desired, in the appropriate menus.
- The character height is suitable for display.
- The colors are suitable.
- The `SERVSWITCH ELITE` window appears on the display for a certain period of time.

To change attributes of the on-screen menus, take these steps:

NOTE

It is possible, when you change the menu attributes, to distort the appearance of the menus/windows so that they are hard or impossible to read, which obviously makes it difficult to correct the problem. If this occurs, you can reset the ServSwitch Elite to its factory-default values for *all options accessible through the on-screen display* by pressing and releasing [Esc] (escape) twice, then [Print Screen], then [F10], then the letter [Y], then [Enter].

1. Press [Print Screen]. The `SERVSWITCH ELITE` window appears on the display.
2. Press [F2] and the `FUNCTIONS` window appears. The Commands menu will be displayed. Press the right arrow ([→]) key to move the highlight bar so that the Setup menu is displayed.
3. Using the up- and down-arrow ([↑] and [↓]) keys, move the highlight bar to `ATTRIBUTES`.

4. Press [Enter]. The PHYSICAL ATTRIBUTES window appears:

PHYSICAL ATTRIBUTES	
RESOLUTION	640
HEIGHT	16
HORIZONTAL	12
VERTICAL	7
BACKGROUND	1
HIGHLIGHT	4
TEXT	7
DELAY TIME	0
ORDER	PORT

Figure 4-6. The PHYSICAL ATTRIBUTES window.

5. Highlight any setting you want to change and use the [+] and [-] keys to cycle to the desired value. As you select different values, the effect of the changes is reflected immediately on the display. Repeat this step as necessary.

The attributes whose values you can change include:

Attribute Effect on Menu/Window Appearance

Resolution Affects the size of the menus and windows as they appear on the display. Choose from values of 320, 480, and 640; the lower the value, the larger the size. The factory-default value is 640.

Height Affects the size of the text in the menus and windows. The larger the value, the larger the text. Possible settings are 1 (1 pixel) to 63 (63 pixels). The factory-default value is 16.

Horizontal Affects the left-to-right positioning of the menus and windows on the display. Possible settings are 1 (1 pixel from the far left) to 127 (127 pixels from the far left, which is as far right as it will go). The factory-default value is 5.

Vertical Affects the top-to-bottom positioning of the menus and windows on the display. Possible settings are 1 (1 pixel from the top) to 255 (255 pixels from the top, which is as far down as it will go). The factory-default value is 11.

- Background** Determines the background color of the menus and windows. Possible choices are 0 (black), 1 (blue), 2 (light green), 3 (cyan), 4 (red), 5 (magenta), 6 (yellow), and 7 (white). The factory-default value is 1 (blue).
- Highlight** Determines the color of the highlight bar appearing in the menus and windows. Possible choices are 0 through 7 as listed above. The factory-default value is 4 (red).
- Text** Determines the color of the text appearing in the menus and windows. Possible choices are 0 through 7 as listed above. The factory-default value is 6 (yellow).
- Delay Time** The time in seconds that elapses after you press [Print Screen] before the `SERVSWITCH ELITE` window appears on screen. The factory-default value is 0 (zero, no delay). You can increase this delay if you find the window becoming a distraction when you perform simple computer-switching operations at the keyboard.
- Order** Determines the order in which the computers are listed in the menus and windows: numerically by port number (the factory-default value), or alphabetically by assigned name.

NOTE

Before you take a formerly autonomous single Switch and attach it as a slave to a master Switch, it is very important that you set Order to "PORT" on that slave Switch; the system could malfunction if you don't. In general, we recommend that you reset any formerly autonomous Switch to its factory defaults (see the note on page 47) before installing it as a slave.

- When you've completed all your desired adjustments, press [Enter] to save the changes to NVRAM. You can press [Esc] (escape) at any time prior to pressing [Enter] to cancel the operation and retain the previous settings.

4.2.9 CHANGING THE ATTRIBUTES OF THE STATUS FLAG

The small on-screen box called the “status flag” indicates the currently connected computer and can be set to appear on the screen whenever the system is operating. You can alter how and where the flag appears on the screen (on a 4x8 Switch, you can do so independently for each console) by changing one or more of the following attributes:

- Its appearance on the screen (none, timed, or constant);
- Its position on the screen; or
- Its color and opaqueness.

To change the flag’s attributes, take these steps:

1. Press [Print Screen]. The `SERVSWITCH ELITE` window appears on the display.
2. Press [F2] and the `FUNCTIONS` window appears. The Commands menu will be displayed. Press the right arrow ([→]) key to move the highlight bar so that the Setup menu is displayed.
3. Using the up- and down-arrow ([↑] and [↓]) keys, move the highlight bar to `FLAG`.
4. Press [Enter]. The `FLAG CONFIGURATION` window appears:

FLAG CONFIGURATION	
ENABLED	NAMES ON
ROW	14
COLUMN	1
COLOR	2
TEXT	0
MODE	TRANSPARENT

Figure 4-7. The FLAG CONFIGURATION window.

- Highlight the setting(s) you want to change and use the [+] and [-] keys to cycle to the desired value. Repeat this step as necessary.

The flag attributes whose values you can change include:

<i>Attribute</i>	<i>Effect on Status-Flag Appearance</i>
Enabled	<p>FLAG OFF = Flag does not appear</p> <p>PORTS ON = Flag indicates the number of the connected port (the factory-default value)</p> <p>NAMES ON = Flag indicates the connected device by name</p> <p>PORTS TIMED = Port number is displayed for 5 seconds after connection</p> <p>NAMES TIMED = Name is displayed for 5 seconds after connection</p>
Row	Determines the flag's vertical position on the screen. This will always depend on the vertical position set for the menu windows (see Section 4.2.8): The status flag will be displayed where one of the rows of text in the windows would be. Valid values range from 0 (top row) to 14 (bottom row). The factory-default value is 0.
Column	Determines the flag's horizontal position on the screen. This will always depend on the horizontal position set for the menu windows (see Section 4.2.8): The status flag will be displayed where one of the text columns in the windows would be. Valid values range from 1 (far-left column) to 25 (far-right column). The factory-default value is 1.
Color	Determines the flag's background color. Possible choices are 0 (black), 1 (blue), 2 (light green), 3 (cyan), 4 (red), 5 (magenta), 6 (yellow), and 7 (white). The factory-default value is 2 (light green).
Text	Determines the flag's text color. Possible choices are 0 through 7 as listed above. The factory-default value is 0 (black).
Mode	Determines whether the background can be seen through the flag ("TRANSPARENT") or not ("OPAQUE," the default setting).

- When you've completed making all your desired adjustments, press [Enter] to save the changes to NVRAM. You can press [Esc] (escape) at any time prior to pressing [Enter] to cancel the operation and retain the previous settings.

To exit the on-screen menus in order to test your new status-flag attributes, press [Esc].

4.2.10 ASSIGNING SPECIFIC DEVICE TYPES

In situations where one or more of the computers attached to the ServSwitch Elite need a special type of monitor or device, it may be necessary to assign that device type to the port number associated with that computer. Also, when you cascade you must make the master Switch aware of the slaves through this assignment. Assign a device type this way:

1. Press [Print Screen]. The `SERVSWITCH ELITE` window appears on the display.
2. Press [F2] and the `FUNCTIONS` window appears. The `Commands` menu will be displayed. Press the right arrow ([→]) key to move the highlight bar so that the `Setup` menu is displayed.
3. Using the up- and down-arrow ([↑] and [↓]) keys, move the highlight bar to `DEVICES`.
4. Press [Enter]. The `MONITOR SETTINGS` window appears:

MONITOR SETTINGS	
PORT	MONITOR
1	SVGA
2	SVGA
3	8515
4	SVGA
5	DEFAULT
6	DEFAULT
7	DEFAULT
8	8PORT

Figure 4-8. The MONITOR SETTINGS window.

- To assign to a monitor or device type, highlight the port you want and use the [+] and [-] keys to cycle to the value that corresponds to the particular monitor or slave type.

NOTE

The proper setting for a slave ServSwitch Elite is “8PORT.” It is also possible to choose “4PORT” because some compatible Compaq and HP KVM-switch models have four computer ports. If you install one of these other units as a slave, choose “4PORT” for the corresponding port in this menu.

There is also a reserved “10PORT” setting, designed with future ServSwitch Elite system capabilities in mind. Do *not* select “10PORT.”

- When you’ve completed making all your desired adjustments, press [Enter] to save the changes to NVRAM. You can press [Esc] (escape) at any time prior to pressing [Enter] to cancel the operation and retain the previous settings.

4.2.11 SETTING SECURITY OPTIONS

Advanced server applications should usually be protected against unauthorized use. By engaging the ServSwitch Elite’s security features, you can “lock” the keyboard, mouse, and monitor (independently for each console on the 4x8 model), requiring users who want to use the console to type a password before the console will resume operating normally. You can lock the console manually, or you can set the Switch to lock the console after a time delay (inactivity timeout) expires. You can also set the unit’s security parameters without locking the console, and you can even set the unit to blank the monitor *without* password protection. To do any of these things, take these steps:

- Press [Print Screen]. The `SERVSUITCH ELITE` window appears on the display.
- Press [F2] and the `FUNCTIONS` window appears. The Commands menu will be displayed. Press the right arrow ([→]) key to move the highlight bar so that the Setup menu is displayed.
- Using the up- and down-arrow ([↑] and [↓]) keys, move the highlight bar to `SECURITY`.
- Press [Enter]. The `SECURITY CONFIGURATION` window appears (see Figure 4-9 below). At first, the only field you can highlight or access is `PASSWORD`; you must always type in the current password in order to access the other fields.

5. Type in the password and press [Enter]. (The factory-default password is “ELITE”; because [Caps Lock] is disabled while the Switch’s display is on screen, you’ll have to hold down [Shift] while you type this in.) The rest of the window components become accessible:

```

SECURITY CONFIGURATION

PASSWORD

NEW PASSWORD
REPEAT NEW

TIME DELAY      OFF
MODE             SCREEN
TEST
  
```

Figure 4-9. The SECURITY CONFIGURATION window.

6. Use the up- and down-arrow ([↑] and [↓]) keys to move the highlight bar to any security feature you want to set differently:
- To set a new password for the Switch, highlight `NEW PASSWORD`, type in a new password, and press [Enter]. (Passwords can be up to 8 characters long, can include any printable character, and are case-sensitive.) The highlight bar will move to `REPEAT NEW` and you will have to type the password in again to confirm your choice.

CAUTION!

Be very careful to memorize your new password or record it in a safe place. If you forget or lose your password, you will have to call Black Box Technical Support for instructions on how to recover your system.

If you aren’t all that concerned about security, but would like to blank the monitor when it isn’t in use, you can press just [Enter] twice with the `NEW PASSWORD` and `REPEAT NEW` fields empty. This “nullifies” the password, so to speak; until you set a password with at least one character in it, pressing *any* keyboard key will unlock the console. The screen-saver and other console-locking functions will be active, but the system will not be secure.

- To set a delay period that the Switch will wait before locking your console after detecting that its keyboard and mouse have become idle, highlight `TIME DELAY`, then choose either “OFF” (automatic lockout disabled, the factory-default setting) or a numeric value in seconds from “1” (the Switch locks out the console when its keyboard and mouse become idle for one second) to “99” (the Switch waits for 1 minute and 39 seconds to lock the console after the keyboard and mouse become idle). You can do this either by typing in the number of seconds (or the letter “O” or the digit zero for OFF) or by using the [+] and [-] keys to increment or decrement the value until you reach your desired setting (from “1,” press [-] to reach OFF this way).
- To choose how the Switch goes about blanking the monitor screen when the console is locked, highlight `MODE`, use the [+] and [-] keys to select either `ENERGY` or `SCREEN`. Use `ENERGY` mode with EnergyStar™ compliant monitors that go into “sleep mode” (power-saver state) after a period of inactivity elapses; in this mode, the Switch blanks the monitor by causing it to go into sleep mode. Use `SCREEN` mode with monitors that aren’t EnergyStar compliant; in this mode, the Switch sends the monitor a Black Box screen saver image instead of the video signal from the selected computer.

CAUTION!

Do not use `ENERGY` mode if your monitor is not EnergyStar compliant. You could damage your monitor.

6. If you’re ready to lock the console right now, use the down-arrow ([↓]) key to move the highlight bar to `TEST` and press [Enter]. The Switch will immediately lock the console in the chosen `MODE`.

If you just want to exit this screen and save the security settings you’ve just chosen to NVRAM, press [Enter] with the highlight bar on anything other than `TEST`.

4.3 Resetting the ServSwitch Elite

If your keyboard or mouse locks up, and resetting the CPU's keyboard and mouse ports doesn't help (see **Section 4.2.4**), you can try pushing the Reset button on the ServSwitch Elite's rear panel in order to reset the Switch. Doing so might allow you to recover the device settings without rebooting your computers.

4.4 Making Connections Under Power

You can connect additional computers or slave Switches to the ServSwitch Elite while it is running. Attach computers as normal; when you attach a slave, make sure to connect the keyboard-extension cable *last*, because the master Switch interprets the keyboard connection as the slave Switch powering up.

When you power up the newly connected computers, the Switch recognizes them, and you can select them without taking any additional steps. After you power up the newly connected slaves, you have to tell the master Switch what they are (see **Section 4.2.10**), but once you do so the slaves are also ready for operation.

You can also disconnect and reconnect the mouse or keyboard to the Switch while the system is powered up. When you connect a new device, the Switch recognizes it, and configures it to the settings required by the currently selected computer. This feature makes it possible for you to replace failed devices without having to restart the system.

Whenever you attach new computers or slaves, or whenever you swap out the mouse or keyboard, you should save the Switch's hardware-configuration settings. If you do not save the settings, they will be lost when the Switch loses power or is turned off. For more information, see **Section 4.2.3**.

4.5 Power-Outage Recovery

Using intelligent keyboard and mouse emulation in ways similar to those it employs for enabling connections under power (see **Section 4.4**), the ServSwitch Elite will help your computers recover from power outages, *if*—and this is very important—the Switch is plugged into a UPS (uninterruptible power supply). (If the Switch has lost power along with the computers, it will have to get *itself* back up when power is restored and might not be able to help your computers.) If a Switch is operating when power returns to the attached computers, all of the computers that are designed to reboot themselves automatically (without user intervention) will do so. The Switch generates responses to ensure that the reboot is successful and that the Switch is ready to switch between computers when regular operation resumes.

5. Troubleshooting

5.1 Common Problems

Here are some difficulties that people sometimes have with the ServSwitch Elite, along with possible causes and solutions. If you don't see your problem here, or if the suggestions here don't help you, call Black Box Technical Support (see **Section 5.2**).

No on-screen display or video on any computer.

1. No power to ServSwitch Elite or monitor? Check the power switches; reconnect the power cables; make sure the AC outlet is actually providing power.
2. Loose monitor connection? Reconnect monitor.
3. Current colors or setup of on-screen display make the display unviewable? Reset the display to its factory defaults (see the note on page 47).

No video on one particular computer.

1. Computer off or unplugged? Power up the computer connected to that port.
2. Loose video connection? Reconnect video cable.
3. Defective video cable? Replace video cable.

Can't select computers.

1. Computer off or unplugged? Power up the computer connected to that port.
2. Keyboard did not initialize? Reset keyboard (and mouse) with ServSwitch Elite's rear-panel reset switch.
3. Keyboard incompatible? Replace keyboard.

Boot-time keyboard errors for all computers.

1. Loose keyboard connection? Check that all cables are well seated.
2. Incompatible or defective keyboard? Replace keyboard.

Boot-time keyboard error for one particular computer.

1. Loose keyboard connection? Check that all cables are well seated; make sure that mouse and keyboard cables are not swapped.
2. Defective keyboard-extension cable? Replace cable.

Keyboard strokes shifted (swaps upper case for lower case).

Computer left keyboard in shifted state when last connected. Press both [Shift] keys.

Boot-time mouse errors for all computers.

1. Loose mouse connection? Check that all cables are well seated; make sure that mouse and keyboard cables are not swapped.
2. Incompatible or defective mouse? Replace mouse with PS/2 style mouse or mouse compatible with CPU mouse port.

Boot-time mouse error for one particular computer.

1. Loose mouse connection? Check that all cables are well seated; make sure that mouse and keyboard cables are not swapped.
2. Defective mouse-extension cable? Replace cable.
3. Using serial port on computer? Either install serial-mouse adapter kit (KV7150) or replace mouse with PS/2 style mouse or mouse compatible with CPU mouse port.

Mouse behaves erratically.

Computer left mouse in indeterminate state. Reset CPU mouse port (see **Section 4.2.4**) or reset ServSwitch Elite (see **Section 4.3**).

Mouse pointer frozen on display.

Mouse not initialized. Reset CPU mouse port (see **Section 4.2.4**) or reset ServSwitch Elite (see **Section 4.3**).

Keyboard or mouse input appears on more than one computer simultaneously.

ServSwitch Elite is in broadcast mode. Go into on-screen display and turn broadcast mode off (see **Section 4.2.5**).

ServSwitch Elite switches from one computer to the next at will.

ServSwitch Elite is in scan mode. Halt scanning by pressing any key or moving mouse.

5.2 Calling Black Box

If you determine that your ServSwitch Elite is malfunctioning, *do not attempt to alter or repair the unit*. It contains no user-serviceable parts. Contact Black Box Technical Support at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- all information displayed in the VERSION window (see **Section 4.2.2**).
- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem—that is, what type of computers, what type of keyboard, brand of mouse, make and model of monitor, etc.
- any particular application that, when used, appears to create the problem or make it worse.
- the results of any testing you've already done.

5.3 Shipping and Packaging

If you need to transport or ship your ServSwitch Elite:

- Package it carefully. We recommend that you use the original container.
- Before you ship the unit back to Black Box for repair or return, contact us to get a Return Authorization (RA) number.

Appendix A: Keyboard Commands for the On-Screen Display

You can use these keys and key sequences to navigate the ServSwitch Elite's on-screen menus and to select on-screen options:

- [Print Screen]** Pressing once activates on-screen display on single or master Switch; for multiple keypresses, see Table 4-2 on page 31.
- [Esc] (escape)** Aborts any changes without executing them; also escapes from current menu.
- [Enter]** Executes the current selection or command or saves changes that have been made.
- [↑] (up-arrow)** Moves up one field or row in the current menu.
- [↓] (down-arrow)** Moves down one field or row in the current menu.
- [→] (right-arrow) or [Tab]**
Moves one field or column to the right (wrapping downward at right edge), or highlights adjacent menu
- [←] (left-arrow) or [Shift] + [Tab]**
Moves one field or column to the left (wrapping upward at left edge), or highlights adjacent menu
- [+]** (plus)
Increases or cycles forward the value in the currently highlighted field.
- [-]** (minus, dash, hyphen)
Decreases or cycles backward the value in the currently highlighted field.
- [Page Up]** Displays the previous screen of a multiscreen display.
- [Page Down]** Displays the next screen of a multiscreen display.
- [Home]** Displays the first screen of a multiscreen display.
- [End]** Displays the last screen of a multiscreen display.

Appendix B: Upgrading the Firmware

The ServSwitch Elite's processor firmware is stored in an EPROM chip mounted on the Switch's motherboard. If you ever need to upgrade the Switch's firmware, you will have to replace this chip. To do so, take these steps:

CAUTION!

The EPROM chip and other components inside the ServSwitch Elite can be damaged by static electricity, so take every reasonable precaution against it. At the very least, discharge yourself on a metallic surface before opening the Switch's access panel; if possible, stand on an anti-static mat and wear a grounding strap or anti-static gloves.

We recommend that you perform this procedure when you do scheduled server maintenance, or when you power down the attached computers for whatever other reason. This is because many computers can't handle the loss of keyboard and mouse signals that occurs when the Switch is turned off, and will malfunction otherwise.

1. Get the tools you will need, a small Phillips screwdriver and a chip puller. (If you don't have a chip puller, you can use a small flat-blade screwdriver.)
2. Save the current hardware settings of the ServSwitch Elite system (see **Section 4.2.3**).
3. Very important: Turn the Switch off, unplug its power cord from the AC outlet, and then detach the cord from the Switch.
4. Look at the bottom of the unit; you will see an access panel in one corner. Use the Phillips screwdriver to unscrew the two screws that hold the panel on, then remove the panel. You should now be able to see the EPROM and NVRAM chips and the unit's main DIP switch, as shown in Figure A-1 on the next page.
5. If you have a chip puller, use it to *carefully* remove the EPROM from its socket. To remove the chip with a flat-blade screwdriver, *gently* and *carefully* pry the chip upward first at one end, then at the other, alternating until the chip comes off. Use *extreme caution* to avoid damaging the chip, its IC socket, or the circuit board.

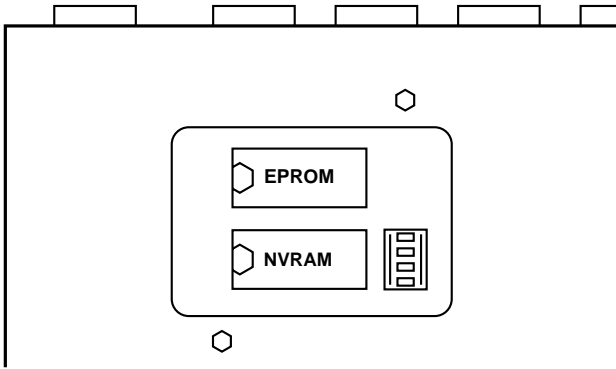


Figure A-1. The location of the EPROM.

6. *Carefully* insert the new firmware EPROM into the socket, making sure that the orientation notch on the EPROM chip matches the outline of the socket and drawing on the circuit board (refer to Figure A-1 on the previous page). Press firmly to make sure that the chip is seated properly in the IC socket, then do one last visual inspection to make sure that all of the pins on the new chip go straight into the socket.
7. Replace the access panel, screw the screws back in, and return the ServSwitch Elite to service. If it does not appear to work properly when you hook it back into the system, call Black Box for technical support.

Appendix C: RS/6000 Handling

The IBM RISC System/6000, better known by its shorter name “RS/6000,” differs significantly from standard PC-type computers, but the ServSwitch Elite is designed to support most RS/6000 systems.

The RS/6000 utilizes a slightly different power-up sequence on the keyboard to allow identification of the RS/6000 series of keyboards. The ServSwitch Elite recognizes this fact and responds accordingly.

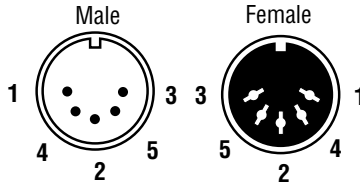
RS/6000 video is even more varied than video is in the PC world, at least in terms of the electrical and physical interfaces that have been built into different models. The RS/6000 can adapt to most PC-style video standards (VGA, SVGA, etc.), and also uses a few video-transmission schemes that PCs usually don't. In particular, the RS/6000 models with 3C3 video ports use a video format called “sync on green.” In this format, the composite sync signal and its ground are carried on the same wire(s) as the green color signal and its ground. Any graphics system that uses sync on green will require an adapter in order to be attached to the ServSwitch Elite. In the case of the RS/6000, the RS/6000 Converter Kit (KV7160A) is designed for this purpose.

Another consideration is the physical video connector. Most contemporary PCs have HD15 connectors, but many RS/6000 models have the 13W3 connectors that are also found on Sun Microsystems® and SGI® machines. Even though these RS/6000 models use the same type of video format as regular PCs—so you won't need the KV7160A Converter—you will still need the special HD15-to-13W3 cable in the EHN6000-ELITE cable kit to attach an RS/6000 with a 13W3 connector to the Switch.

Appendix D: Interface Pinouts

D.1 IBM PC/AT Compatible Keyboard

Pinout on **5-pin DIN** connectors:

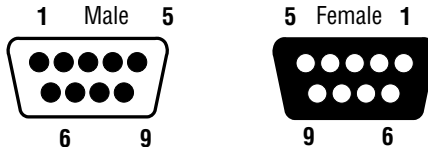


Pin	Signal/Circuit Name	Signal Function	Signal Source
1	Keyboard Clock	Timing	Computer
2	Keyboard Data	Data	Keyboard
3	Keyboard Reset ¹	Control	Computer
4	Ground	Ground	n/a
5	+5 VDC	Voltage	Computer

¹This line/signal was used by XT and very early AT computers to reset the keyboard. Contemporary AT compatible computers either do not use it or do not connect it.

D.2 IBM PC/AT Compatible Serial Mouse

TIA-574 pinout of EIA/TIA RS-232-C/D on **DB9 (DE9)** connectors:



Pin	Signal/Circuit Name	Signal Function	Signal Source
1	Received Data	Data	Mouse
3	Transmitted Data	Data	Computer
4	Data Terminal Ready	Control	Computer
5	Signal Ground	Ground	n/a
7	Request to Send	Control	Computer

(All other pins are not connected or not used.)

D.3 IBM PS/2 Compatible Keyboard and Mouse

Standard pinout on **6-pin mini-DIN** connectors:



Male



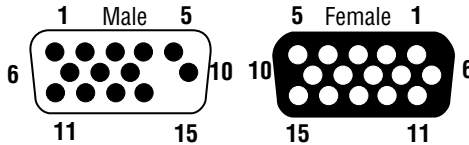
Female

Pin	Signal/Circuit Name 1	2	4	Signal Function 2	3 Signal Source 1
1	Keyboard or Mouse Data		4	Data	Keyboard or Mouse
2	Reserved ¹			n/a	n/a
3	Ground			Ground	n/a
4	+5 VDC			Voltage	Computer
5	Keyboard or Mouse Clock			Timing	Computer
6	Reserved ¹			n/a	n/a

¹These pins are normally not used or not connected, but some KVM switches (not including the ServSwitch Elite) use them to carry the RS-232 serial transmit data signal and signal ground respectively, in order to be more easily adaptable for use with serial mice and serial mouse ports.

D.4 IBM Video Graphics Array (VGA), Super Video Graphics Array (SVGA)

Original standard pinout on **HD15 (DA15)** connectors:



Pin	Signal/Circuit Name	Signal Function	Signal Source
1	Red	Data	Computer
2	Green	Data	Computer
3	Blue	Data	Computer
4	ID 2 ¹	Control	Monitor
5	No Connection ²		
6	Red Return	Ground	n/a
7	Green Return	Ground	n/a
8	Blue Return	Ground	n/a
9	Key (No Pin) ³		
10	Ground ⁴	Ground	n/a
11	ID 0 (Ground) ⁵	Control	Monitor
12	ID 1 (N/C) ⁵	Control	Monitor
13	Horizontal Sync	Timing	Computer
14	Vertical Sync	Timing	Computer
15	ID 3 ⁶	Control	Monitor

¹This pin is sometimes not used or not connected.

²This pin is sometimes used as a ground.

³In standard implementations, this pin is not only not connected, the space where it would be in the connectors is simply left blank.

⁴This is the ground for all of the non-video signals.

⁵In the original VGA standard, if the computer senses that Pin 11 is a ground and Pin 12 is not connected, it assumes a color monitor and outputs color VGA. If it senses that Pin 11 is not connected and Pin 12 is a ground, it assumes a monochrome monitor and outputs "VGA monochrome." (Often computers check only Pin 11.)

⁶This pin is very rarely used and is most often not connected at all.

