Personal ServSwitch™

BLACK BOX® NETWORK SERVICES

SW625A-R2
SW626A-R2

Doc. No. 590-033 Rev. B

BLACK BOX® NETWORK SERVICES

Important Notice about the Personal ServSwitch

In the unlikely event that your computer interface doesn't provide sufficient power to the Personal ServSwitch, please use *only* a Listed Direct Plug-In Transformer marked "Class 2" or "LPS" whose output is rated at 6 VDC and at least 700 mA.

Document No. 590-159-001 Rev. A

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!

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

<div align="center">

SW625A-R2
SW626A-R2

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FEDERAL COMMUNICATIONS COMMISSION AND INDUSTRY CANADA
RADIO-FREQUENCY INTERFERENCE STATEMENTS

Class B Digital Device. This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or telephone reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult an experienced radio/TV technician for help.

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

To meet FCC requirements, shielded cables and power cords are required to connect this device to a personal computer or other Class B certified device.

This digital apparatus does not exceed the Class B limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe B prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT

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 connectado 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 fisica 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 lineas de energia.

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 objectos liquidos 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: Objectos 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.

Contents

1. Specifications

Compliance —   FCC Class B, IC Class/classe B

**Hardware
Required —**   VGA/SVGA monitor that supports your computers'
highest video standard

Compliance —   Safety: UL 1950, CSA 22.2 No. 950, EN60950;
EMI/RFI: FCC Class B, IC Class/classe B, EN55022,
EN50082

Standards —   VGA (color or monochrome/page white), SVGA, or
XGA video

Interfaces —   PS/2 keyboard and mouse, video as listed above, and
(computer side only) RS-232 serial mouse

Resolution —   Up to 1024 x 768 noninterlaced at 80 Hz

Protocol —   RS-232 (serial mouse): Asynchronous, 3-byte/8-bit

Data Rate —   RS-232 (serial mouse): 1200 bps (fixed)

**Maximum
Distance —**   6 ft. (1.8 m) from Personal ServSwitch to any attached
device; might be farther depending on the quality of
your cable and the voltages at which your computers
drive the keyboard, mouse, and video signals

User Controls —   Keyboard commands;
(1) Front-mounted CPU SELECT pushbutton

Indicators —   SW625A-R2: (4) Front-mounted LEDs:
(2) CPU operating, (2) CPU selected;
SW626A-R2: (8) Front-mounted LEDs:
(4) CPU operating, (4) CPU selected

Connectors —   All rear-mounted:
(1) 1.3-mm barrel jack for optional 6-VDC power;
(2) 6-pin mini-DIN female: (1) To shared keyboard,
(1) To shared mouse;
(1) HD15 female: To shared monitor;

Connectors
(continued) — For each computer port (SW625A-R2 has 2, SW626A-R2 has 4):
    (2) 6-pin mini-DIN female: (1) To keyboard ports, (1) To PS/2 mouse ports;
    (1) HD15 female: To video cards;
    (1) DB9 female: To RS-232 serial mouse ports

Temperature
Tolerance — Operating: 41 to 104˚F (5 to 40˚C);
Storage: –4 to +122˚C (–20 to +50˚C)

Humidity
Tolerance — Up to 90% noncondensing

Enclosure — High-impact plastic

Power — From keyboard interface (no other power supply necessary for most applications);
Optional external power supply for use in cascaded systems (see **Section 3.2**):
    For 115-VAC operation, PS626 (wallmount):
      Input: 120 VAC, 60 Hz;
      Output: 6 VDC, 700 mA;
    For 220-VAC operation, PS626E (in-line):
      Input: 100 to 250 VAC, 47 to 63 Hz autosensing;
      Output: 6 VDC, 2 A

NOTE

In the unlikely event your computer interface does not provide sufficient power to the Personal ServSwitch, please use a Listed Direct Plug-In Transformer marked "Class 2," or a power supply that is confirmed to be a Limited Power Source ("LPS"), and rated at 6 VDC, 700 mA only.

Size — SW625A-R2:
    1.9" H (1U) x 8.1"W x 5"D (4.8 x 20.6 x 12.7 cm);
SW626A-R2:
    2.7" H (1U) x 8.1"W x 5"D (6.9 x 20.6 x 12.7 cm)

Weight — SW625A-R2:
    Net: 1.1 lb. (0.5 kg); Shipping: 1.5 lb. (0.7 kg);
SW626A-R2:
    Net: 1.3 lb. (0.6 kg); Shipping: 1.7 lb. (0.8 kg)

2. Introduction

The Personal ServSwitch allows you to control multiple PCs, easily and affordably, with just one keyboard, monitor and mouse. There is no software to install and no boards to configure, so installation is simple. The Switch works with IBM® PC/AT® and PS/2® compatible systems that support VGA, SVGA, or XGA video.

When you turn on your PCs, they will boot up without interruption, because the Personal ServSwitch sends out keyboard-response signals that eliminate boot-time keyboard errors. You can turn on your PCs one at a time or all at once. The first available channel is automatically selected upon power-up.

You can switch computer channels two ways: with the CPU Select button on the Personal ServSwitch's front panel, or with a short keyboard sequence.

The Personal ServSwitch also has these features:

- PS/2 mouse translation: Your PS/2 mouse will work with any attached PC, regardless of whether the PC uses a serial or PS/2 mouse!

- Full support for the Microsoft® IntelliMouse®.

- You can use standard straight-through-pinned keyboard, mouse, and video cables to attach computers to the Switch.

- Built-in scanning: Scan through all of your attached PCs automatically, for 2 to 60 seconds each.

- Cascadable expansion: Add up to two additional tiers of Personal ServSwitch units for system expansion. With cascading, the SW625A-R2 supports up to 8 PCs; the SW626A-R2 supports up to 64 attached computers.

- Hot-pluggable: New PCs can be added or removed without powering down the Switch or other attached PCs.

- Status LEDs: Two LEDs per port give you constant readings on the status of your Personal ServSwitch. The green LED stays lit as long as a powered PC is attached to the port; the amber LED lights to show that the port is selected for display.

3. Installation

3.1 Basic Installation

3.1.1 BEFORE YOU INSTALL

You will need the appropriate kits of straight-through-pinned cables in order to connect your PCs to the Personal ServSwitch, one kit for each PC. These kits consist of 6-pin mini-DIN male-to-male cables for keyboard connections, HD15 male-to-male for video connections, and either a second 6-pin mini-DIN male-to-male for PS/2 type mouse connections (our product code EHN405-PS2) or a DB9 male-to-female for serial mouse connections (our product code EHN405-AT). The EHN405-AT kit also comes with an FA212 keyboard adapter so that you can connect a computer with one of the older-style 5-pin DIN AT keyboard connectors.

3.1.2 CONNECTING YOUR PERIPHERALS

Take these steps to attach the shared peripherals to your Personal ServSwitch, referring to Figure 3-1. Use their own cables to connect your VGA monitor, keyboard, and mouse to the Switch instead of your computer: Plug your PS/2 keyboard's cable into the 6-pin mini-DIN Switch connector marked with the keyboard symbol ("▦"; this connector is on the back of your Switch in its User Console section). Plug your PS/2's mouse cable into the 6-pin mini-DIN User Console connector marked with the mouse symbol ("▯"). Lastly, plug your VGA, SVGA, or XGA video cable into the HD15 female User Console video port.
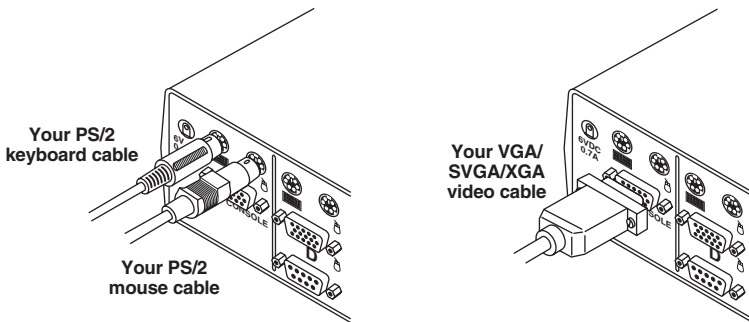

Figure 3-1. Attaching the peripherals.

3.1.3 CONNECTING YOUR COMPUTERS

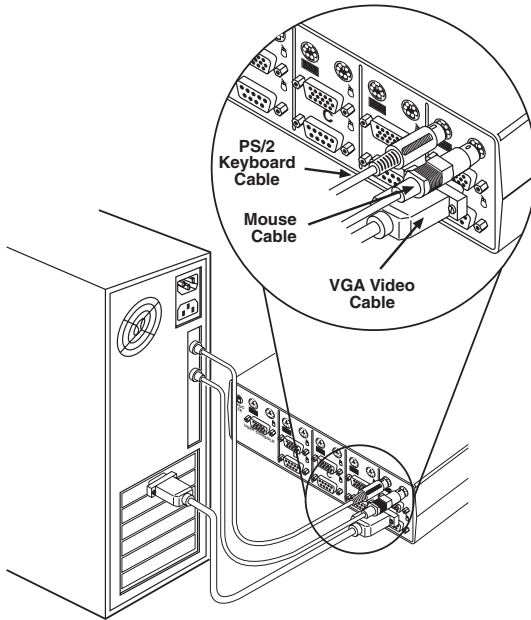Take these steps to attach the computers to your Personal ServSwitch, referring to Figure 3-2:

Figure 3-2. Attaching the computers.

1. Power down all computers that will be part of your Personal ServSwitch system.

2. Get the appropriate cable kit to attach your first computer to the Switch (refer to **Section 3.1.1**). Plug the keyboard patch cable (6-pin mini-DIN male-to-male) into the ▦ connector of the first available computer port on your Personal ServSwitch. The computer ports are labeled A and B on the SW625A-R2 and A through D on the SW626A-R2.

   Next, plug your mouse patch cable into the appropriate ⬠ connector of the same port. Depending on what type of mouse port your computer has, you should either plug the second 6-pin mini-DIN male-to-male cable from an EHN405-PS2 kit into the 6-pin mini-DIN female (PS/2 style) ⬠ connector, or plug the DB9 male-to-female cable from the EHN405-AT kit into the DB9 female (PC/AT style) ⬠ connector. Attach only one mouse cable per computer.

   Plug the HD15 male-to-male video cable into the monitor input connector.

Lastly, plug the free end of each cable into the matching port on your computer. (You'll need the FA212 keyboard adapter from the EHN405-AT cable kit for any computer that has a 5-pin DIN keyboard port.) Tighten all thumbscrews.

3. Repeat step 2 for each additional computer you want to attach to the Switch, then power up all attached computers.

3.2 Cascading

If you need to control more computers than one Personal ServSwitch will support, you can cascade, or interconnect, multiple Personal ServSwitch units.

You can connect your keyboard, monitor, and PS/2 mouse to the User Console connectors of the first Personal ServSwitch in the cascade, called the "base unit," just as you would for a single unit installation. Additional Switches, called "expansion units," can be added to the system by connecting cables between the labeled ports on the base unit and the User Console connectors of the expansion unit. (Ports are labeled A and B on the SW625A-R2, A through D on the SW626A-R2.) See Figure 3-3.
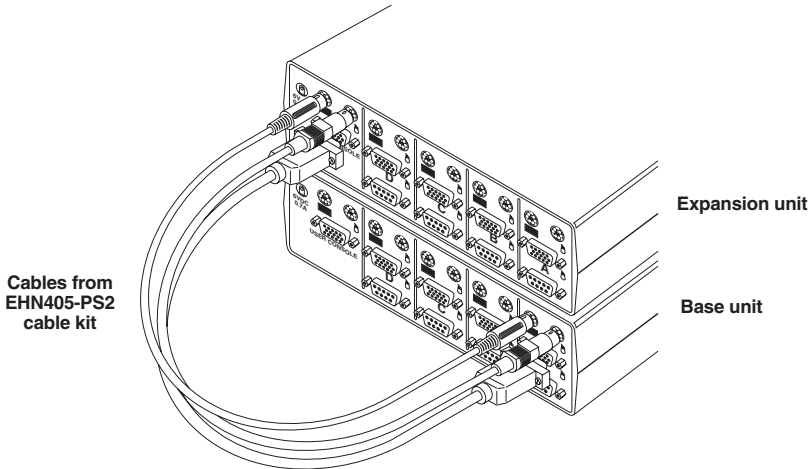

Figure 3-3. Cascade: Base unit (bottom) plus one tier with one expansion unit (top).

At this point, you can either connect PCs to the ports on the expansion units, or expand your system further by adding a second tier of expansion units, as shown in Figure 3-4. (The maximum size of a cascaded system is one SW626A-R2 base unit, four first-tier SW626A-R2 expansion units, sixteen second-tier SW626A-R2 expansion units, and 64 PCs.)
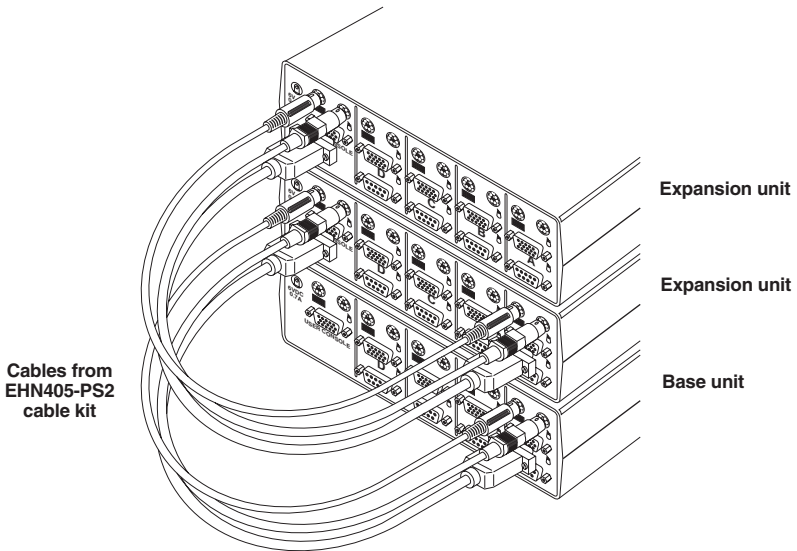

Figure 3-4. Cascade: Base unit (bottom) plus two tiers, each with one expansion unit (middle, top).

Before beginning your cascaded installation, please note that you will need an EHN405-PS2 cable kit for each expansion unit in the system.

1. Choose an unused computer port on the rear of your Personal ServSwitch base unit. Plug one of the kit's 6-pin mini-DIN male-to-male cables into the port's ⌨ connector, and the other 6-pin mini-DIN male-to-male cable into the PS/2 style (6-pin mini-DIN) 🖰 connector. Plug the kit's HD15 male-to-male video cable into the port's HD15 female video connector.

2. Plug the other end of the PS/2 keyboard cable into the User Console ⌨ connector on your Personal ServSwitch expansion unit. Plug the other end of the PS/2 mouse cable connector into the User Console 🖰 connector. Plug the other end of the video cable into the User Console video connector. See Figure 3-5 on the next page.
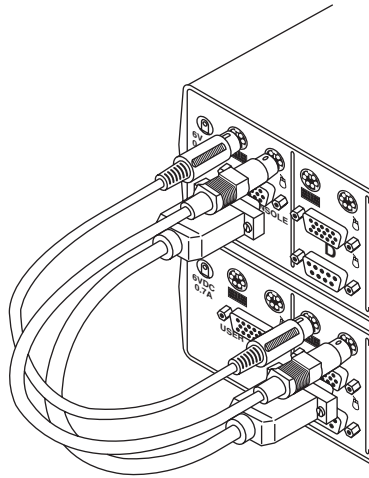
Figure 3-5. Cascade: Cable interconnection.

3. For cascaded operation, you should use the optional 6-VDC power supply—
our product code PS626 for 110-VAC operation or PS626E for 220-VAC
operation—with any Switch that does not have at least one attached PC. (You
should not need this power supply with any Switch that can get power from an
attached PC.) Plug the transformer into the power socket on the Switch's rear
panel, as shown in Figure 3-6. Plug the other end into an appropriate AC wall
outlet. **In the unlikely event your computer interface does not provide
sufficient power to the Personal ServSwitch, please use a Listed Direct Plug-In
Transformer marked "Class 2," or a power supply that is confirmed to be a
Limited Power Source ("LPS"), and rated at 6 VDC, 700 mA only.**

Figure 3-6. Cascade: Attaching the optional 6-VDC power supply.

4. Make sure that all Switch units with power supplies are plugged in, then turn
on all attached PCs.

4. Operation

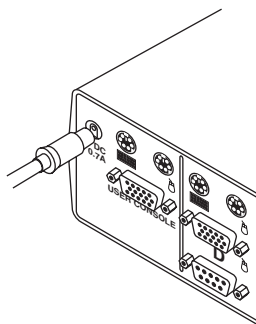You can turn on your PCs one at a time or all at once. The green LEDs over each port letter on the Personal ServSwitch will light, indicating that the attached computer is powered on. After power-up, the Switch will light the amber LED of the currently selected port. Other PCs may now be selected for operation, as detailed in **Section 4.1**. You can also scan the PCs, as shown in **Section 4.2**, or enter other commands (see the **Appendix**).

4.1 Selecting PCs

There are two ways to select a PC on the Personal ServSwitch. One way is with the CPU Select pushbutton. Pressing this selects the next computer in sequence; for example, if you are currently interacting with the PC on Port B, pressing CPU Select switches to the PC on Port C. The other way of selecting ports is by entering a short sequence of keystrokes on the keyboard. This is called keyboard, or hotkey, switching.

   Press the Control key twice within one second to place your Personal ServSwitch in Command Mode. Your keyboard LEDs (Num Lock, Caps Lock, and Scroll Lock) will flash to verify that you are operating in Command Mode. Now, whatever you type will be interpreted as Personal ServSwitch system commands until you press [Enter] to accept the command or [Esc] (escape) to cancel.

   Once you're in Command Mode, type the letter(s) corresponding to the port address of the PC you wish to select. (The port address will be one letter if you are using a single Switch, two letters if you're using two tiers of Switches, and so on, because you need to specify which port each successive expansion unit is on before you specify the actual PC port.) For example:

  [CTRL][CTRL] C [ENTER]   Selects the PC on Port C.

  [CTRL][CTRL] B [ENTER]   Selects the PC on Port B.

  [CTRL][CTRL] AB [ENTER]   Selects the expansion unit on the base unit's
                              Port A, then the PC on the expansion unit's
                              Port B.

  [CTRL][CTRL] D [ESCAPE]   (When [ESCAPE] is pressed, command in
                              progress is aborted. Currently selected port
                              remains selected.)

4.2 Scanning PCs

The Personal ServSwitch's scanning feature allows you to automatically monitor, or scan, each PC in your Switch system. If you use the keyboard during scanning, the scan will pause until you finish, then resume with the next PC. (You can set the Switch to pause scanning on mouse activity as well if you want.) The scan "dwell time" (the length of time each PC's video remains on the screen) can be changed at any time. Scanning will be halted if the Halt command is entered or if another PC is selected.

The following key sequences configure and control scanning.

Key Sequence	Action
[CTRL][CTRL] D*nn* [ENTER]	Sets the dwell time in seconds, where *nn* = any value from 02 to 60. The default value is 05 (five seconds).
[CTRL][CTRL] SG [ENTER]	Scan Go (starts scan).
[CTRL][CTRL] SH [ENTER]	Scan Halt (stops scan).
[CTRL][CTRL] M– [ENTER]	Mouse activity does not pause scan (default setting).
[CTRL][CTRL] M+ [ENTER]	Mouse activity pauses scan in the same way that keyboard activity does.

Some examples:

[CTRL][CTRL] D10 [ENTER]	Each PC's video will remain on screen for ten seconds before the next port is displayed.
[CTRL][CTRL] SG [ENTER]	Scanning begins with the current computer, then continues to the next PC in sequence.
[CTRL][CTRL] SH [ENTER]	Scanning stops until the Go command is reissued.
[CTRL][CTRL] M+ [ENTER]	Until the M- command is issued, scans pause on ports until all keyboard *and* mouse activity stops.

5. Troubleshooting

5.1 Problems That Might Occur

5.1.1 WITH THE UNIT ITSELF

Green channel LED not lit
Verify that the computer is powered on. Check the cabling between your computer and the Personal ServSwitch. Verify that a keyboard works when plugged directly into your PC.

Unable to switch channels
Verify that all attached PCs are powered and correctly connected to the unit.

5.1.2 WITH VIDEO

No video
Verify that the video cable between the computer and the Personal ServSwitch is connected to the selected port. Verify that the monitor cable is also correctly connected to the video port in the User Console section of the single or base unit.

Power down the computer. Connect the monitor directly to the computer and power up again. If the monitor does not operate correctly when attached directly to the computer, try another monitor.

5.1.3 WITH THE MOUSE

Mouse jumps or "hugs screen"
Try the mouse-resynchronization command, [CTRL][CTRL] ZM [ENTER], once or—if the first command doesn't help—twice.

If this doesn't work—especially if the mouse has been hot-plugged while the selected PC is running in Windows®—you might need to exit Windows and restart it.

Mouse is inoperable on one or more channels
Try the mouse reset command: [CTRL][CTRL] MR [ENTER] if it's a PS/2 mouse or [CTRL][CTRL] MW [ENTER] if it's an IntelliMouse.

Verify that the cables from the computer to the Personal ServSwitch are connected properly. Verify that the mouse is plugged into the mouse port in the User Console section on the rear panel of the single or base unit.

Verify that the computer works properly with a mouse connected directly to it. If not, try another mouse.

Lost mouse signal after hot-plugging cascaded Switch
This sometimes happens. Switch ports on the cascaded Switch to restore the signal.

5.1.4 WITH THE KEYBOARD

Keyboard is inoperable on one or more channels
Verify that the cables from the PC to the Personal ServSwitch are connected
properly. Verify that the keyboard is plugged into the keyboard port in the User
Console section on the rear panel of the single or base unit.

Verify that the keyboard works properly when connected directly to the
computer. If not, try a different keyboard.

If the keyboard still does not function, cycle power on all attached computers
and try again.

Keyboard is inoperable after switching channels *or*
Characters on screen do not match keyboard input
Some types of IBM compatible computers, particularly some PS/2s and high-end
servers, use unusual keyboard "scan modes." This means that they interpret
keyboard signals slightly differently than most other computers. Try changing the
keyboard scan mode by using the keyboard command sequence [CTRL] [CTRL]
Kn [ENTER], where n is the number of the scan mode from 1 to 3 (2 is the default
used by most IBM compatible computers).

5.2 Calling Black Box

If you determine that your Personal ServSwitch 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:

- the nature and duration of the problem;

- when the problem occurs;

- the components involved in the problem—that is, what type of PCs, 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; and

- the results of any testing you've already done.

5.3 Shipping and Packaging

If you need to transport or ship your Personal ServSwitch:

- 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: Keyboard Commands

These are all of the keyboard commands that you can currently use to operate the Personal ServSwitch.

Key Sequence	Action
[CTRL][CTRL] *X* [ENTER]	Selects the PC on the single or base unit's port *X*.
[CTRL][CTRL] *XY* [ENTER]	Selects the expansion unit on the base unit's port *X* and the PC on that expansion unit's port *Y*.
[CTRL][CTRL] *XYZ* [ENTER]	Selects the expansion unit on the base unit's port *X*, the expansion unit on that unit's port *Y*, and the PC on that unit's port *Z*.
[CTRL][CTRL] D*nn* [ENTER]	Sets the dwell time in seconds, where *nn* = any value from 02 to 60. Default is 05 (five seconds).
[CTRL][CTRL] SG [ENTER]	Scan Go (starts scan).
[CTRL][CTRL] SH [ENTER]	Scan Halt (stops scan).
[CTRL][CTRL] M– [ENTER]	Mouse activity does not pause scan (default).
[CTRL][CTRL] M+ [ENTER]	Mouse activity pauses scan.
[CTRL][CTRL] ZM [ENTER]	Resynchronizes the mouse.
[CTRL][CTRL] MR [ENTER]	Resets the mouse if it is PS/2 type.
[CTRL][CTRL] MW [ENTER]	Resets the mouse if it is an IntelliMouse.
[CTRL][CTRL] K*n* [ENTER]	Sets the keyboard scan mode, where *n* = the number of the scan mode from 1 to 3. Default is scan mode 2.
[CTRL][CTRL] AV [ENTER]	Displays the current firmware version of your Switch. You must be either at a DOS prompt or in a text editor or word processor to view this.