ServSwitch™ *BRAND*

CAT5 BROADCAST
Video System

BLACK BOX ®
NETWORK SERVICES

BLACK BOX ®
NETWORK SERVICES

ACL8500A
ACL8501A
ACL8502A
ACL8503A

Welcome to the ServSwitch™ Family!

Thank you for purchasing BLACK BOX® ServSwitch™ Brand video equipment! We appreciate your business, and we think you'll appreciate the many ways that this product will save you money, time, and effort.

✻

Our ServSwitch family is all about breaking away from the traditional, expensive model of computer management and display. You know, the one-size-fits-all-even-if-it-doesn't model that says, "One computer gets one dedicated monitor or 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 many monitors or user stations for the same computer? Why not access or display any of your computers, anywhere in the world, with any of your monitors or user stations?

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?

- Do you have to send video from one computer to two different local monitors? Or do you need to send video from multiple computers to dozens of monitors both near and far?

- 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!

✻

SERVSWITCH™ BRAND CAT5 BROADCAST VIDEO SYSTEM

   This manual will tell you all about your new ServSwitch™ Brand CAT5 Broadcast Video System, including how to install, operate, and troubleshoot it. For an introduction to the System, see **Chapter 2**. This manual ships with the System Hub, whose product code is:

ACL8500A

The manual also covers the System's Local and Remote Modules, which also come with their own installation guides:

ACL8501A
ACL8502A
ACL8503A

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INDUSTRY CANADA
RADIO-FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio-frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

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

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 Industry Canada.

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

EUROPEAN UNION DECLARATION OF CONFORMITY

This equipment complies with the requirements of the European EMC directive 89/336/EEC.
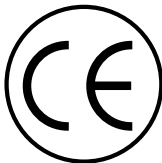
NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT

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 — CE; FCC Part 15 Subpart J Class A, IC Class/ classe A

Standards — VGA, SVGA, XGA, or XGA-2 video

Interface — VGA

Supported Video Types — RGBHV (VGA, SVGA, XGA, or XGA-2), RGBS, RGsB ("sync on green"), TV (NTSC, PAL, SECAM), and Y/C (S-Video)

Resolution and Refresh Rate — Up to 1280 x 1024 noninterlaced at up to 85 Hz (depends on distance)

Maximum Distance — Up to 1000 ft. (300 m) of Category 5 cable between the Local Module and any Remote Module

User Controls – On Remote Modules (ACL8502A and ACL8503A): Right-side-mounted Focus dial

Indicators — (1) Power LED on each System component

Connectors —   On Hub (ACL8500A):

       (9) Front-mounted RJ-45 female:

          (1) for video input from Local Module,

          (8) for video output to Remote
             Modules;

       (1) Rear-mounted 6-pin DIN female for
          power;

On Local Module (ACL8501A):

       (1) Left-side-mounted HD15 male for
          video input from source device;

       (1) Right-side-mounted HD15 female for
          pass-through video output to a local
          monitor or other destination device;

       (1) Right-side-mounted RJ-45 female for
          video output to, and power input from,
          Hub;

On regular Remote Module (ACL8502A):

       (1) Left-side-mounted RJ-45 female for
          video and power input from Hub;

       (1) Right-side-mounted HD15 female for
          video output to destination device;

On Dual Remote Module (ACL8503A):

       (2) Left-side-mounted RJ-45 female:

          (1) for video and power input from
             Hub,

          (1) for pass-through video and power
             output to another Remote Module;

       (1) Right-side-mounted HD15 female for
          video output to destination device

SERVSWITCH™ BRAND CAT5 BROADCAST VIDEO SYSTEM

Maximum Altitude — 10,000 ft. (3048 m)

Temperature Tolerance — Operating: 32 to 104˚F (0 to 40˚C);
Storage: −4 to +140˚F (−20 to +60˚C)

Humidity Tolerance — Up to 80% noncondensing

Enclosure — Hub: Steel;
Local and Remote Modules: Aluminum

MTBF — 100,000 hours (calculated estimate)

Power — Hub: From utility-power (mains) outlet,
through included detachable input cord
and external universal power supply:
Input: 90 to 260 VAC at 47 to 63 Hz
(autosensing);
Output: +12 VDC at 4.2 A, −12 VDC at 4.2 A;
Consumption: 7.2 watts plus 140 mW for
any attached Local Module and 175 mW
for each attached Remote Module
Local Unit: From Hub, on Pins 7 and 8 of the
Category 5 cable between them:
Input: 24 VDC at 100 mA;
Consumption: 2.4 watts;
Remote Units: From Hub, on Pins 7 and 8 of
the Category 5 cable between them:
Input: 24 VDC at 125 mA;
Consumption: 3 watts

Size —   Hub: 1.5"H x 6.75"W x 7.2"D
                       (3.8 x 17.2 x 18.3 cm);
                       Local Module: 1.2"H x 4.5"W x 2.75"D
                       (3 x 11.5 x 7 cm);
                       Remote Modules: 1.2"H x 5.5"W x 2.75"D
                       (3 x 14 x 7 cm)

Weight —   Hub: 2 lb. (0.9 kg);
                       Local Module: 3.9 oz. (110 g);
                       Remote Modules: 4.6 oz. (130 g)

2. Introduction

2.1 Overview

The ServSwitch™ Brand CAT5 Broadcast Video System is a simple but powerful set of products that you can use to distribute computers' video output to as many as 128 displays using standard Category 5 structured cabling. The System consists of several components:

- The Hub (our product code ACL8500A) is the center of the system. It takes one video input from a Local Module and splits it into eight video outputs to Remote Modules; these inputs and outputs are all on CAT5 cables. At the same time, it passes DC power to the Local and Remote Modules over the same CAT5 cables.

- The Local Module (ACL8501A) is designed to be attached—with a short, non-included cable—to the video connector(s) on a computer or other video source. It adapts the source's video output for twisted-pair cable. You can attach a local monitor to it, too. It gets all the power it needs across the CAT5 cable from the Video System's Hub.

• VGA and multisync monitors can be plugged directly into the regular Remote Module (ACL8502A) and the Dual Remote Module (ACL8503A). (Other types of monitors and video devices can be attached with adapters or adapter cable.) The Remote Modules adapt the video back onto standard cable. The Dual Remote Module has an extra pass-through port that you can use to daisychain to an additional Remote Module. Like the Transmitter, both types of Remote Modules get all the power they need across the CAT5 cable from the Hub.

2.2 Features and Benefits

• Send video to as many as 128 destinations from a single source, using just a few devices and modular Category 5 cable. This means you can display your video everywhere at your site without spending a lot of money getting it there. It also means that expanding and rearranging the System is easy.

• The System is vastly flexible. It can carry virtually any form of video: RGBHV (VGA, SVGA, XGA, XGA-2, etc.), RGBS, RGsB ("sync on green"), TV (NTSC, PAL, SECAM), Y/C, etc. And with its advanced sync-handling technology, it can support almost any kind

of display device—including LCD panels, video projectors, and plasma displays—just as long as the display device can accept the type of sync that the source device outputs.

- The Local and Remote Modules don't have to be plugged into AC power—they get all their power through the cable from the Hubs they're attached to—so you can place them anywhere.

- Cabling is extremely simple: *All* of the video signals *and* power are carried on a single 568B-pinned Category 5 cable. In most cases, you can even use the CAT5 cable that's already installed at your site, because the System is compatible with both shielded and unshielded twisted pair.

- The System can carry 120 MHz of video (1280 x 1024 at 90 Hz, for example) across as much as 1000 ft. (300 m) of standard CAT5 cable, so you can cover a huge area from a single central location. (Unlike other products of this type, you can use the same Hubs, Local and Remote Modules, and cabling whether your distances are very short or very long.)

- All System units are rackmountable; see **Appendix A**.

2.3 Applications

The ServSwitch Brand CAT5 Broadcast Video System is ideal for use in many different environments:

- At **airports** and other **transportation terminals**, you can distribute arrival/departure information, baggage-claim carousel information, and much more.

- In today's **courtrooms**, you can present computer-based evidence on LCD panels at each juror's position, at the judge's bench, and elsewhere in the courtroom.

- In **schools**, you can show learning material to all of the students in a classroom or even all of the students in a building.

- At **gas stations** and **convenience stores**, you can display videotaped advertisements at all of your gas pumps and throughout your store.

- In **electronics stores**, you can run one video feed to all of your display-model TVs or computers.

- In **television studios**, everyone will be able to see what's going out to your viewers.

- At **hotels** and **conference centers**, you can post displays of daily schedules and public messages at all of your useful locations.

- In **financial houses**, you can easily distribute real-time financial information around trading floors and/or offices from a single control point.

- You can send **corporate presentations** to multiple personal display stations in your boardroom or throughout your headquarters.

2.4 The System Illustrated

Figures 2-1 through 2-7 show where all of the connectors and controls are on the various components of the ServSwitch Brand CAT5 Broadcast Video System.
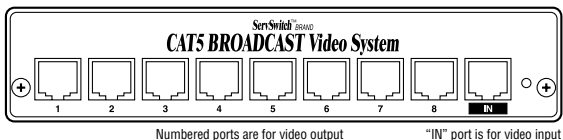

Numbered ports are for video output   "IN" port is for video input

Fig. 2-1. The front panel of the Hub (ACL8500A).

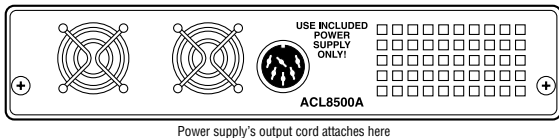Power supply's output cord attaches here

Fig. 2-2. The rear panel of the Hub.
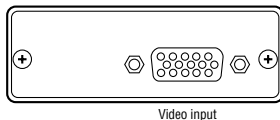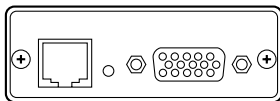

Video input

Fig. 2-3. The left side of the Local Module (ACL8501A).

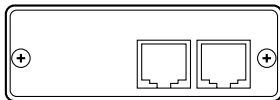RJ-45 is for video output to Hub and power input from Hub

HD15 is for video output to local monitor

Fig. 2-4. The right side of the Local Module.

Video and power input from Hub
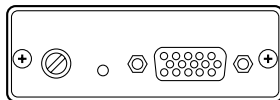
Fig. 2-5. The left side of the regular Remote Module (ACL8502A).

Right RJ-45 is for video and power input from Hub

Left RJ-45 is for pass-through video and power output

Fig. 2-6. The left side of the Dual Remote Module (ACL8503A).

HD15 is for video output to remote monitor

Adjust Focus dial for better picture

Fig. 2-7. The right side of both types of Remote Module.

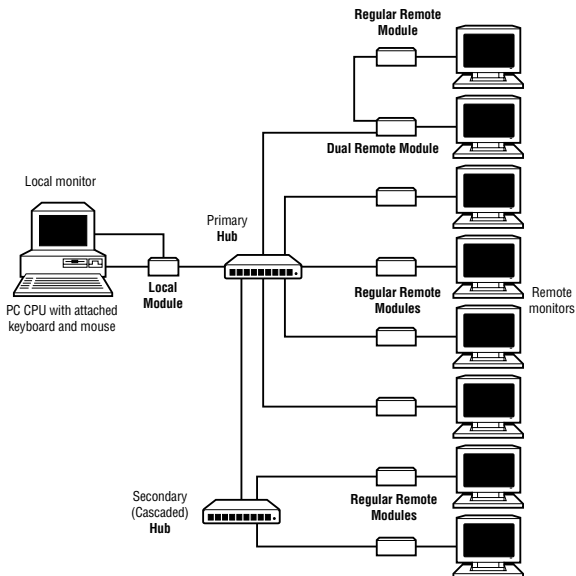Figure 2-8 shows a ServSwitch Brand CAT5 Broadcast Video System installation that uses all of the System components.

Fig. 2-8. An installation involving all System components.

3. Installation

3.1 The Complete Package

With the ServSwitch Brand CAT5 Broadcast Video System Hub (ACL8500A), you should have received the Hub, its power supply, and this manual. With any Local Module or Remote Module, you should have received the Module and an install sheet. If you didn't receive everything, or if anything arrived damaged, contact Black Box right away.

3.2 What Else You Will Need

You'll need these things to be in place before you can install your Video System:

- Your computer or other video-source device.

- To connect the System's Hub to the Local and Remote Modules: Four-pair, "straight-through" wired, shielded or unshielded Category 5 (*not* CAT5e or higher) cables, pinned and paired according to the EIA/TIA-568B standard. Refer to **Appendix C** for the preferred pinout for these cables.

- Monitors that can display the video you're distributing (they must support its resolution, refresh rate, etc.).

- Video adapters, cables, or converters as necessary.

3.3 Placement

Place the System's Local Module and its Remote Modules on flat surfaces, or rackmount them, as close as possible to the associated video-source device and video-destination devices.

   Place each of your System's Hubs on a convenient flat surface, or in a rack, in a central location near a working AC-power (mains) outlet.

   Place the System's Remote Modules on flat surfaces, or rackmount them, as close as possible to the associated video-destination devices.

   If you'd like to rackmount any of your System Hubs or Modules, refer to **Appendix A** for directions.

3.4 Connecting Your Devices

To install your ServSwitch Brand CAT5 Broadcast Video System, take the steps listed in this section. Call Black Box Technical Support if you need any special adapters or cables.

1. Run a short VGA-extension cable (such as our product code EVNPS05-MF) from the HD15 male port labeled "VGA Input" on your Local Module to the HD15 female video port of your computer or other video-source device. If the device has some other kind of video connector(s), run a video-adapter cable or video-extension cable (as short as possible), through any necessary video adapter or converter, from the Module to the device. See **Appendix B** for a list of available video adapters.

2. *Optional:* Plug the HD15 male connector of a video cable from a local monitor or other video-destination device into the Local Module's HD15 female connector labeled with the word "Local" and a monitor icon. If this device doesn't have an attached video cable, or if its video cable doesn't have an HD15 male connector on the Module end, attach an adapter or run an adapter cable between the Module and the device or its video cable.

3. Run a Category 5 cable from the RJ-45 socket on the Local Module (the connector marked "Link to HUB") to the RJ-45 socket marked "IN" on the (first) Hub.

As you run CAT5 cable, make sure that you don't run it too far—no more than 1000 ft. (305 m) of UTP or 800 ft. (240 m) of STP between devices—and make sure you don't run it too close to electrically noisy equipment (motors, generators, compressors, fluorescent lights, etc.).

4. Run Category 5 cables from the numbered RJ-45 sockets on the Hub to the "IN" ports on other Hubs or to the RJ-45 sockets labeled "Link from HUB" on your Remote Modules.

5. *If you are using any Dual Remote Modules in your System,* run a Category 5 cable from the RJ-45 socket labeled "Signal Pass-Thru" on each Dual Remote Module to the RJ-45 socket labeled "Link from HUB" on a regular Remote Module. (You *must* make this connection in order for the Dual Remote Module to be properly terminated. If you don't, the unterminated Dual Remote Module's video output will be significantly degraded.)

We recommend that you avoid installing more than two "layers" of Hubs or more than one "layer" of Dual Remote Modules. That is, it's OK to run from your first Hub to as many as eight Dual Remote Modules or secondary Hubs, and from each of your secondary Hubs to as many as eight Dual Remote Modules. (This configuration can reach up to 128 monitors.) But don't run (a) from your secondary Hubs to a third set of Hubs, (b) from one Dual Remote Module to a second Dual Remote Module, or (c) from the "Signal Pass-Thru" port on a Dual Remote Module to another Hub.

6. Plug the HD15 male connector of a video cable from a local monitor or other video-destination device into each Remote Module's HD15 female connector labeled with a monitor icon. If this device doesn't have an attached video cable, or if its video cable doesn't have an HD15 male connector on the Module end, attach an adapter or run an adapter cable between the Module and the device or its video cable. See **Appendix B** for a list of available video adapters.

3.5 Powering the System and Making Adjustments

Plug the *output cord* of the included power supply into the power connector on the back of each of the Hubs in your Video System. Attach the *input cord* to the power-supply transformer's IEC 320 male inlet, and plug its other end into a working AC-power (mains) outlet. Each Hub should begin operating immediately (the Hub has no ON/OFF switch).

Now make sure that your video-source device and all of your video-destination devices are plugged in and turned ON if they aren't already. The video from the source device should be received by each destination device; use the Focus dial on your Remote Modules to get the best possible picture at each destination.

Your ServSwitch Brand CAT5 Broadcast Video System should now be ready for continuous operation, and should not require any further operator intervention.

4. Troubleshooting

4.1 Things to Check

If you're having difficulty with your ServSwitch Brand
CAT5 Broadcast Video System, make sure that:

- Your video-source device (computer, etc.) is
  plugged into a working outlet, is ON, and is
  operating properly. (If this device is a computer,
  you can test it by directly attaching a monitor.
  With the monitor attached, do you see the video as
  it should appear?)

- Your Local Module is securely attached to the
  source device's video-output port.

- Each of your System's Hubs is plugged into a
  working outlet. (You can test outlets by temporarily
  plugging in lamps, etc., to see if they work.)

- Your video-destination devices (monitors, etc.) are
  plugged into working outlets, are ON, are securely
  attached to their Remote Modules, and are
  operating properly. (If the device is a monitor, you
  can test it by directly attaching it to a computer. In
  this condition, do you see the computer's video as
  it should appear?)

• The System doesn't include more than 128 video-destination devices.

• Your CAT5 cables are:

    (a) intact;

    (b) securely connected to the *correct* ports in your System—for example, cables to output devices aren't plugged into input ports and vice versa;

    (c) not run too far—total UTP cabling between the Local Module and any Remote Module shouldn't be longer than 1000 ft. (305 m), total STP cabling shouldn't be longer than 800 ft. (240 m);

    (d) not run too close to sources of electrical interference such as motors, generators, compressors, and fluorescent lights;

    (e) terminated with standard RJ-45 connectors; and

    (f) wired straight-through and pinned and paired in accordance with EIA/TIA-568B.

If none of these suggestions solves the problem, call Black Box Technical Support as described in **Section 4.2**.

4.2 Calling Black Box

If you determine that your Video System is malfunctioning, *do not attempt to alter or repair it.* None of its components contain 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 types of computer, what makes and models of monitors, 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.

4.3 Shipping and Packaging

If you need to transport or ship any Video System component:

- Package it carefully. We recommend that you use the original container.

- Before you ship it back to Black Box for repair or return, contact us to get a Return Authorization (RA) number.

Appendix A:
Rackmounting System Components

For the ServSwitch Brand CAT5 Broadcast Video System's Hub, we offer a Rackmount Kit for mounting a single Hub in a 19" equipment rack; our product code for this Kit is RMK8500. For the Local and Remote Modules, we offer a Rackmount Kit for mounting as many as six Modules in a 19" rack (RMK8501).

To mount a Hub or Module in a rack using one of these Kits, first decide which way you want the unit to face: The Hubs can be mounted with either the front or rear panel facing forward, and the Modules can be mounted with either the left or right side facing forward. (For most people, it's most convenient to have the RJ-45 sockets facing forward, but your application might call for them to face the rear of the rack.)

Now take these steps, referring to Figure A-1 on page 32 and Figure A-2 on page 33:

1. Unscrew the two side screws on the end of the Hub or side of the Module that you want to face forward.

2. Remove the bezel and the loose faceplate or side plate. (Keep the bezel in storage if you think you might ever want to use the unit as a standalone again).

3. Put the exposed end or side of the unit against the *back* of the Rackmount Kit bracket (the side of the bracket on which the flanges at the top and bottom are longer). Line up the unit so that (a) the edges of the unit's case are behind the edges of the mounting hole in the bracket, and (b) the two screwholes in the unit where you removed the screws match up with the screwholes in the bracket beside the mounting hole.

4. Take the unit's faceplate or side plate that you removed earlier, place it against the *front* of the bracket, and line up its screwholes with the screwholes in the bracket.

5. Insert and tighten the screws through the plate, though bracket, and back into the unit's case.

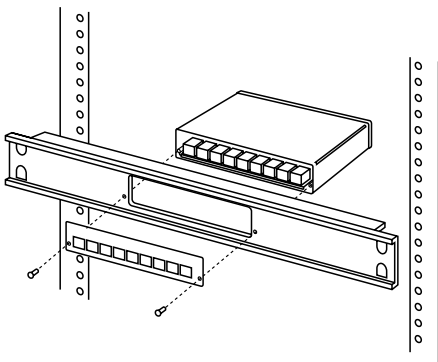6. Secure the Kit bracket to the rack using your own screws, bolts, cage nuts, etc.

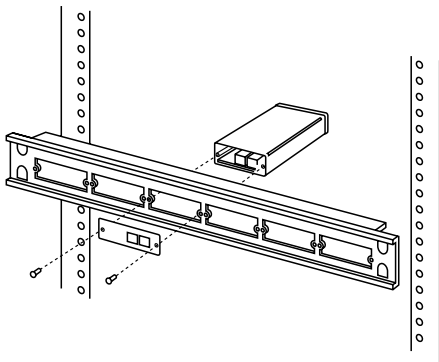**Fig. A-1. Rackmounting the Hub front forward.**

Fig. A-2. Rackmounting a Local or Remote Module (Dual Remote Module shown, with left side facing forward).

Appendix B:
Available Video Adapters

We offer four different nonpowered video adapters for use with the ServSwitch Brand CAT5 Broadcast Video System. All of them are designed to be attached between the System's Local Module and the video-source device, so they have an HD15 female connector on the Local Module side.

- The Mac® adapter (product code EVMA22), designed for older Apple® Macintosh® computers, has a DB15 male connector on the source-device side. It also has DIP switches; set these for the monitor type that your Mac CPU expects, and the adapter will emulate that monitor by sending the proper ID bits to the CPU.

- The Sun® adapter (product code FA8500SUN), designed for older Sun Microsystems® computers, and the SGI® adapter (product code FA8500SGI), designed for older SGI computers, both have a 13W3 male connector on the source-device side.

• The universal generic adapter (product code FA8500BNC) has five BNC female connectors—three color leads and two sync leads. It can support computers that output RGBHV, RGBS, RGsB, etc., on multiple BNCs, such as some IBM® RS/6000® models.

   It can also carry as many as three channels of NTSC, PAL, or SECAM TV signals (one channel on each of the red, green, and blue leads). (High-end TV equipment and cables will have BNC connectors; to connect consumer equipment/cables with RCA® connectors, use our RCA to BNC adapters, product code FA870.)

   Lastly, it can also carry a single S-Video channel (luminance on one color lead, chrominance on another). To do this, you'll need a BNC Breakout (product code AC425A) to adapt the 4-pin mini-DIN female S-Video connector to a pair of BNC female connectors.

Appendix C:
Pinout of Category 5 Cable

The Category 5 cable you will run throughout your
ServSwitch™ Brand CAT5 Broadcast Video System should
be terminated with RJ-45 plugs and should be wired
according to the EIA/TIA-568B standard. Looking into
the RJ-45 sockets on any Hub or Module, or looking at
the cable plug from behind, Pin 1 should be on the left
and Pin 8 on the right, and the wires should be arranged
this way (the "standard signal" is the one carried during
normal VGA broadcast):

Pin	Color	Pair	Standard Signal
1	White/Orange	2	Red +
2	Orange/White	2	Red –
3	White/Green	3	Green +
4	Blue/White	1	Blue +
5	White/Blue	1	Blue –
6	Green/White	3	Green –
7	White/Brown	4	Sync + and +24V
8	Brown/White	4	Sync – and –24V

Avoid using CAT5e cables or cables rated "Level 6,"
"Level 7," etc.

NOTES