

Document Version A0

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The United States Federal Communications Commission (in 47CFR 15.838) has specified that the following notice be brought to the attention of the users of this product.

Federal Communication Commission Radio Frequency Interference Statement

"This equipment generates and uses 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 and television reception. It has been typetested and found to comply with the limits for a Class B 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 in a residential installation. However there is no guarantee that interference will not occur in a particular installation. If this equipment causes interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- » Re-orient the receiving antenna
- » Relocate the matrix with respect to the receiver
- » Move the matrix away from the receiver
- » Plug the distribution matrix into a different outlet so that computer and receiver are on different branch circuits

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the booklet, *How to Identify and Resolve Radio-TV Interference Problems*, prepared by the Federal Communications Commissions to be helpful."

This booklet is available from the US. Government Printing Office, Washington, D.C. 20402, Stock N. 004-000-00345-4.

Use shielded cables. To comply with FCC Class B requirements, all external data interface cables and adapters must be shielded.

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AutoPatch Statement of Warranty

AutoPatch, warrants that the products manufactured by it will, under normal use and service, be free of defects in materials and workmanship for a period of two (2) years from the date of shipment shown on the sales invoice or warranty registration on file. With respect to any AutoPatch product found to be defective during this warranty period, AutoPatch's liability and Buyer's remedies under this warranty shall be limited solely to repair, replacement, or credit, at AutoPatch's option. This warranty will not apply to any AutoPatch product that has been modified, repaired after leaving the factory, or improperly installed, used, of maintained.

This warranty is exclusive and in lieu of any other warranty, expressed or implied, including but not limited to any implied merchantability or fitness for a particular purpose.

AutoPatch shall not be liable under any circumstances for consequential or incidental damages including, but not limited to, labor costs or loss of profits arising in connection with the use of or inability to use AutoPatch products.

These warranty terms may not be modified except in writing by an authorized officer of AutoPatch.

The terms of this warranty are governed by the laws of the state of Washington; certain other states restrict warranty limitations. You may have rights that are not defined herein.

Warranty Extensions

Extended warranties providing the same benefits as the original two year warranty are offered on the following terms:

- 1.Warranty extensions will be allowed only on products for which we receive a warranty registration within 90 days of shipment.
- 2. All extension transactions must be completed before the first anniversary of the warranty registration date.
- 3. Extensions can be purchased in one year increments to a maximum of eight (8) years.
- 4. The price PER YEAR of the warranty extension will be calculated as one percent (1%) of the original invoice net price for the product.

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Introduction

The AutoPatch *half-* Y Distribution Matrix (*half-* Y) is a signal switching device that can route audio, video, and data signals. The *half-* Y uses upper and lower Input/Output (I/O) boards as the switching path for up to twelve signals. The *half-* Y can be controlled through a variety of devices, including a control panel on the front of an enclosure (Local X/Y Control Panel) and an external controller capable of sending and receiving information via the DB-9 port or other means.

How to Use This Manual

This manual contains three chapters and two appendices. The information in this manual progresses from unpacking and installing your distribution matrix in Chapter 1, to product specifications in Appendix D. Use the following chapter descriptions to guide you through the manual.

Chapter 1 - Installing the Distribution Matrix

A *half*-Y can be installed in a variety of environments. Chapter 1 discusses the materials included in the shipping boxes, what they are used for, and how to install the distribution matrix in many types of environments. The startup sequence of the *half*-Y is also discussed in this chapter.

Chapter 2 – Operating the Distribution Matrix

The *half-* Y is capable of several operations. Chapter 2 explains the operations and discusses operating the sync board.

Chapter 3 – The Enclosure and Its Parts

The enclosure is a metal chassis that houses the I/O boards, power supply, CPU, sync assembly, and installed options. Chapter 3 provides a "roadmap" to the important features of *half*-Y enclosures and a description of the feature functions.

Appendix A – AutoPatch Service/Returns Policy

Appendix A presents the AutoPatch Service/Returns Policy. Please note that if you need to return an enclosure, it should be returned in its original shipping box.

Appendix B – Troubleshooting

This appendix contains quick answers to most minor glitches that may arise.

Appendix C – DB-9 Port Serial External Controllers

This appendix contains information about external serial controllers that can be attached to the DB-9 port of the *half*-Y. Instructions for installation and operation (using Basic Control Structure) are included.

Appendix D - Product Specifications

The product specifications include *half*-Y technical specifications and performance information about the *half*-Y.

Typographical Conventions

In this manual, text conventions are used to designate particular meanings, such as key specifications and particular matrix operations. The convention for X/Y Control Panel keys is initial caps. For example, "press the second Input key," specifies the second white key from the left on the control panel.

Non-specific procedures or components of the matrix appear in lower case letters. For example, "... to check status, press...," refers to the status procedure, or "... the matrix would be...," refers to any matrix.

Notes, warnings, and any text that requires special attention appears in bold. Note or warning paragraphs are indented. Pay attention to any notes and warnings; they are specifically labeled to designate importance.

Definition of Terms Used in This Manual

Input/Output (I/O) Board - I/O boards are the switching path for the signals attached to the I/O connectors.

Upper Level - The top I/O board as viewed from the back of the *half*-Y.

Lower Level - The bottom I/O board as viewed from the back of the *half*-Y.

Enclosure - A metal chassis that houses I/O boards, a CPU, and a power supply.

Distribution Matrix - The distribution matrix, or matrix, is the functional definition of the *haff* Y hardware and software. The terms routing switcher, switching matrix, and routing matrix are also used commonly in the audio/video industry to describe a distribution matrix. The distribution matrix facilitates the routing of an input signal to no outputs, all outputs, or any combination of outputs.

Local X/Y Control Panel - The panel on the front of the enclosure that provides the capability to enter commands.

Controller - A device that controls the routing of a matrix. A controller can be an X/Y Control Panel (remote or local), a serial controller, or other type of controlling device.

External Controller - An external controller is any device other than the Local X/Y Control Panel that is used to change the input/output configuration. External controllers can be dumb terminals or any device that can send and receive ASCII code via the DB-9 port or other means. Examples of external controllers are MIDI controllers, third party control systems, or a PC that uses a serial communication program to communicate with the distribution matrix.

System - Must have one or more controllers and one matrix.

Technical Support

AutoPatch provides technical support from 6 a.m. to 5 p.m. PST Monday-Friday. Before calling with a question, please consult this manual first. If the manual cannot fully answer your question, call your authorized AutoPatch dealer or call AutoPatch Customer Service at: (toll free) 800-622-0246, (international) 509-235-2636, or through our BBS at 509-235-9258.

Chapter 1—Installing the Distribution Matrix

A *half*-Y distribution matrix is a signal switching device that has the ability to route any of its inputs to one or more of its outputs. Depending on configuration, your matrix can route audio, video, and data signals.

The enclosure contains a power supply, CPU board, and Input/Output (I/O) boards. Each of the I/O boards constitutes a level. A level is the switching environment for the signals attached to it.

Please note there are several configuration versions of this product so the graphics in this manual may differ from the version you purchased.

This chapter covers:

- □ Unpacking the *half*-Y
- □ Installing the *half*-Y
- **Connecting Inputs and Outputs**
- **Connecting the Vertical Interval Sync Signal**
- **Connecting and Applying Power**
- □ Startup Sequence

1.1 Unpacking the half-Y



figure 1.1 AutoPatch half-Y Distribution Matrix

Before opening the shipping carton(s), examine it for any signs of damage. If the carton is partially crushed or any side has been broken open, notify the shipping agency immediately.

The shipping carton holds the enclosure, packing list, instructions, the *haff*-Y User Reference Manual, the power cord, and other enclosure products. To be sure your shipment is complete, the carton(s) is marked as "Container $\#_of_-$." The first blank is for the carton number and the second blank is for the total number of cartons in the shipment. An enclosure weighs approximately 3.5 lb. (1.6 kg). After removing the enclosure from its carton, collect all documentation and envelopes. Keep your shipping carton in case you need to return the product or ship it to other sites.

Note: AutoPatch will not be responsible for damage to returned products incurred during shipping due to insufficient packaging. If requested, AutoPatch will supply a new shipping carton at cost.

1.2 Installing the half-Y

The *half*-Y can be installed in a standard EIA 19'' rack or on a desktop. If installing the distribution matrix in a rack, mount it in the rack after attaching the rack ears.

To install a *half*- Y on a desktop, place the four rubber pads (included in the shipping carton) on the bottom of the enclosure.

To attach the rack ears:

Remove the two countersunk screws toward the front on each side of the enclosure, for a total of four screws removed. Place a rack ear on one side of the enclosure. Insert the three screws that came with the ear to hold it in place. Repeat for the other side. See figures 1.2 and 1.3.



figure 1.2 Remove original screws



figure 1.3 Attach ears with provided screws

1.3 Connecting Inputs and Outputs



figure 1.4 Input and Output connectors

Note: Input and output connectors may vary. Figure 1.4 displays the input and output connectors for a 12x4 *haff*-Y with BNC video connectors on the upper level, and pluggable 3-position terminal block connectors for audio on the lower level.

Input and output connectors are found on the rear of the enclosure, to the right of the CPU area. The output connectors are to the right of the input connectors. Input and output connectors are BNC for video and pluggable 3-block terminal for audio, or optionally RCA for both.

To attach BNC video inputs and outputs, plug the video cable into the proper input or output connector. To attach 3 position block terminal pluggable audio inputs and outputs, unscrew the clamps on the audio connector plug, insert the proper wire and tighten the clamp so the audio wire makes a proper connection. Then insert the connector plug into the appropriate input or output connector slot. Figure 1.5 displays examples of single-ended audio inputs and outputs for both mono and stereo signals. Differential inputs and outputs use a different connector.

Note: To help alleviate low frequency noise problems in audio system twisted pair interconnections, connect the shield at one end only.



figure 1.5 Single-ended stereo and mono connections

1.4 Connecting the Vertical Interval Sync Signal

The sync processor allows switching to occur during the vertical interval. The sync assembly can utilize a master sync signal, blackburst, or any genlocked video source.

To use a video signal as the sync signal as well as a usable input signal, split the signal and attach it to both the sync connector and a video input connector. The sync connector is the BNC plug next to the power switch on the rear of the enclosure. See figure 1.6.

1.5 Connecting and Applying Power



figure 1.6 Rear enclosure, CPU side

The power connector for the provided power cord is next to the power switch on the rear of the enclosure. The voltage requirements for the enclosure are as follows: 100 - 250 VAC at approximately 1.6 Amps for 50/60/440 Hz, or 120 - 300 VDC at approximately 1 Amp. The power supply is universal and automatically adjusts to the proper voltage setting within the specified range. If you did not receive a power cord with your matrix, contact your authorized AutoPatch dealer.

To apply power, toggle the power switch up. To turn power off, toggle the power switch down.

After applying power, test the I/O connections by making a switch. Refer to section 2.1, "Making and Disconnecting Switches," for instructions.

1.6 Startup Sequence

The startup sequence begins when power is applied to an enclosure. The enclosure(s) is designed to be continuously powered up. Upon power up, the power LED illuminates, followed closely by the Level LEDs. While the matrix is running, the I/O configuration is stored in RAM. I/O configurations are not restored after power has been cycled.

Chapter 2—Operating the Distribution Matrix

half-Y switching operations require a few simple key presses using an X/Y Control Panel, or a few basic commands using one of several other controllers.

Please note that unless otherwise specified, all the procedures in this chapter are written for an AutoPatch X/Y Control Panel. For instructions on operating your matrix from an external serial controller, refer to Appendix C in this manual. For all other controlling devices, please refer to the installation and operations manual that came with the device.

This chapter covers:

- □ Making and Disconnecting Switches
- Checking Status
- □ Locking Out Control Panel Switches
- **G** Switching During the Vertical Interval



figure 2.1 Local X/Y Control Panel, 12x4

Switches can occur on one or both I/O levels. By activating one level and not the other, your matrix can perform breakaway switches in a composite signal set that utilizes both levels.

Both levels are initially active, by default. A level is not deactivated after a switch is made.

To make a switch:

1. Select one or both levels by pressing the appropriate Level key(s).

If neither level is selected (neither level LED is illuminated), the specified switch does not occur. The left Level key corresponds to the upper level, the right Level key corresponds to the lower level. If neither level LED is illuminated, refer to section 2.3, "Locking Out Control Panel Switches."

- 2. Select an input by pressing an Input key.
- 3. Select an output by pressing an Output key.

If desired, steps 2 and 3 may be performed in reverse order.

To make a breakaway switch:

1. Deselect video or audio for breakaway by pressing the appropriate Level key.

The left Level key corresponds to the video level, the right Level key corresponds to the audio level. If neither level LED is illuminated, refer to section 2.3, "Locking Out Control Panel Switches."

Select an input by pressing an Input key.

Select an output by pressing an Output key.

If desired, steps 2 and 3 may be performed in reverse order.

To disconnect a switch:

Repeat the process of making a switch. Re-doing a switch disconnects it.

2.2 Checking Status

Status is constantly displayed in the crosspoint LEDs for the active level. If your levels have different I/O configurations, check the status of one level at a time.

To check status for one level, activate it by selecting its Level key. The LED above the selected key should illuminate. The crosspoint LEDs also illuminate to display the level's I/O configuration.

2.3 Locking Out Control Panel Switches

Locking out control panel switches maintains the current I/O configuration while preventing new switches from occurring through the X/Y Control Panel. When the control panel is locked, status is not displayed.

To lock out control panel switches:

Turn both levels off by pressing each Level key until the LED above it is off.

To unlock the control panel:

Activate a level. The LED above the active level's key illuminates.

2.4 Switching During the Vertical Interval

The sync processor can accept a sync pulse or strip the sync pulse from a composite video signal. If a sync pulse is not detected within 1/30th of a second from a switch command switching will occur by default.

Attaching a video signal connector to the sync connector enables the sync processor. To use a video signal as the sync signal as well as a usable input signal, split the signal and attach it to both the sync connector and a video input connector.

Chapter 3—The Enclosure and Its Parts

The appearance of the enclosure is dependent on several factors, including control method, signal type, and I/O configuration. This chapter describes the physical features of a typical $half^2$ Y enclosure.

This chapter covers:

- □ Front of an Enclosure
- **General Rear of an Enclosure**

3.1 Front of an Enclosure

An enclosure may have a Blank Front Panel or an X/Y Control Panel.

3.1.1 Blank Front Panel



figure 3.1 Blank Front Panel

The Blank Front Panel has the Power LED to indicate when the matrix is powered up and the AutoPatch logo. See figure 3.1. Use an external controlling device in conjunction with this front panel.

3.1.2 X/Y Control Panel



figure 3.2 12x4 X/Y Control Panel

The X/Y Control Panel has 2 level keys, up to 12 input keys, and up to 4 output keys. Depending on the I/O configuration of the matrix, the number of input and output keys will vary. For example, if the I/O configuration is 8x2, there will be 8 input keys and 2 output keys. See figure 3.3.



figure 3.3 8x2 X/Y Control Panel

3.1.2.1 Level (Breakaway) Keys

The Level keys are used for specifying the level (for breakaway switches) when making a switch. The left Level key corresponds to the upper level, and the right Level key corresponds to the lower level. When a Level is active, the corresponding LED is illuminated.

3.1.2.2 Input Keys

The Input keys are used for selecting an input during a switch operation.

3.1.2.3 Output Keys

The Output keys are used for selecting an output during a switch operation.

3.2 Rear of an Enclosure



figure 3.4 12x4 enclosure, rear view

The rear of an enclosure is where all the physical connections are made. The rear of an enclosure contains the audio and video I/O connectors, power switch, CPU, sync connector, and zero to two DB-9 ports. The input and output connectors are attached to I/O boards within the enclosure.

3.2.1 I/O Boards and Connectors

An enclosure can contain two I/O boards which can be any combination of audio and/or video boards. The number and type of connectors on the boards depends on the matrix configuration. Looking at the rear of the enclosure, the inputs are to the left and the outputs are to the right. The connectors mirror the keys on the front panel.

3.2.2 DB-9 Port

The half-Y can be ordered with zero to two DB-9 ports or other type of external controller interface. Use the DB-9 ports for controlling the matrix with an external controlling device that uses RS-232 or RS-422.

3.2.3 Vertical Interval Sync Connector

The sync connector is a BNC connector located to the right of the power switch. The sync processor allows switching to occur during the vertical interval.

3.2.4 Power Switch



figure 3.5 Enclosure CPU

The power switch is on the left side of the enclosure, between the power connector and the vertical interval sync connector. Toggle the switch up to turn the enclosure on, and down to turn the enclosure off. The enclosure contains volatile RAM, so if the enclosure is turned off and then turned back on, previous I/O configurations are not recalled.

3.2.5 Power Connector

The power connector is on the left side of the enclosure. The voltage requirements are as follows: 100 - 250 VAC at approximately 1.6 Amp at 50/60/440 Hz, or 120 - 300 VDC at approximately 1 Amp. The power supply is universal and automatically adjusts to fit your electrical environment within the specified range.

Appendix A—AutoPatch Service / Returns Policy

A.1 Service

The AutoPatch *half*- Y must be serviced only by authorized AutoPatch service agents.

A.2 Return Authorizations

Except for warranty claims, merchandise will not be accepted for return or exchange after the first thirty (30) days following the invoice date.

Merchandise will not be accepted for any reason without a Return Materials Authorization (RMA) number. Returned items must be shipped prepaid, insured, with the RMA number clearly stated on the outside of each carton and, if possible, in original packing container(s).

Note: AutoPatch will not be responsible for damage incurred in shipping due to insufficient packaging. If requested, AutoPatch will supply a new shipping carton at cost.

Products and parts returned or exchanged for any reason other than warranty purposes are subject to a restocking fee not greater than twenty percent (20%) of the invoiced price, if returned in unused condition.

A.3 Claims for Shipping Damages

Unless otherwise specified, merchandise is normally shipped by Federal Express Economy service. AutoPatch reserves the right to select the final method and carrier for any shipment.

Although we take special care to ensure the safe arrival of all orders, shipping accidents and damage can occur. Shipments are transferred to the appointed carrier in good condition and AutoPatch's liability for the product ceases when the transfer to the carrier is complete. Therefore, claims for damages and shortages must be filed with the transporting company by the receiving party within fifteen (15) days of receipt. Visible damage and shortages must be noted on the freight bill; packaging and contents must be retained for inspection.

A.4 Replacement Policies and Procedures

Following is a list of steps to take in the event of a problem with your Auto-Patch half-Y.

During the warranty period:

- 1. Describe the problem to an AutoPatch dealer, regional representative, or the AutoPatch customer service department.
- 2. Upon verification of a problem that requires factory repairs, an AutoPatch customer service representative will issue a Return Materials Authorization (RMA) number and we will, at no cost, repair or replace the part(s) returned to the factory and return the part(s) to the sending party. If conditions do not permit this procedure, we will invoice new or reconditioned (at AutoPatch's option) replacement part(s) to the dealer and ship the part(s) to the dealer or to the consumer if so directed by written order from the dealer. Unless otherwise instructed in writing by an AutoPatch customer service representative, part(s) replaced under this warranty must be returned to the factory:
 - A) within thirty (30) days;
 - b) with shipping and insurance costs prepaid;
 - c) with the RMA number clearly indicated on the outside of each container;
 - d) if possible, in the original shipping container(s);
 - e) and with a written description of problem.

If the replaced part(s) are returned within thirty (30) days, we will apply credit to the dealer's account for the total value of part(s) determined defective, plus return shipping costs. Any part(s) received after thirty (30) days or otherwise not in compliance with these requirements may be refused and credit will not be issued.

3. Repaired or replaced part(s) will be warranted for the remainder of the original system warranty period, for the first thirty (30) days following the invoice date, or we will extend the original warranty period by the period of verifiable downtime, whichever provides the greatest benefit.

Following warranty expiration:

- 1. Call your AutoPatch dealer, area representative, or the AutoPatch customer service department with a description of the problem.
- 2. Upon verification of a problem that requires factory repairs, an AutoPatch customer service representative will issue a Return Materials Authorization (RMA) number. We will, at nominal cost, invoice the sending party, repair or replace the part(s) returned to the factory and return those part(s) to the sending party. If conditions do not permit this procedure, we will invoice

and ship new or reconditioned (at AutoPatch's option) replacement part(s) to the dealer or to the consumer if so directed by written order from the dealer.

3. Post warranty repairs and replacements are warranted for the first thirty (30) days following invoice date.

A.5 Special Notice

AutoPatch reserves the right to modify or discontinue designs, specifications, warranties, and policies without notice. All data with regard to model numbers, series, specifications, and prices in our literature have been thoroughly reviewed and edited. Although we cannot assume responsibility for inadvertent omissions or errors, we sincerely apologize if misunderstandings occur, and we will appreciate your criticism, corrections, and suggestions.

Appendix B—Troubleshooting the half-Y

The *half*-Y has no field-serviceable parts. This chapter presents some quick fixes to common problems.

If you experience the following problems...

Unable to make switches from the front panel

The front panel may be locked. Make sure the LED for the level you want to make a switch on is illuminated. Switches occur on the level(s) with the illuminated level key(s).

Unable to communicate serially

Check all your communication protocols and connector pins.

- If you ordered an RS-232 enclosure, only use an RS-232 cable.
- If you ordered an RS-422 enclosure, only use an RS-422 cable.

Too many signals are switching

Both levels may be activate. If both levels are activate, deactivate one of the levels. Switches only occur on active levels.

Appendix C – DB-9 Port Serial External Controllers

External control of the half-Y can be effected via the DB-9 port. The DB-9 port accepts BCS commands which are ASCII characters. External controllers include PCs, Macintosh computers, and third party serial devices.

This appendix covers:

- □ Installing Serial Controllers
- Operating Serial Controllers
- □ BCS Software Handshaking
- □ Software

C.1 Installing Serial Controllers

Your enclosure may come with one, two, or zero DB-9 ports, depending on what you ordered from the factory. You can attach an external controller to either DB-9 port 1 or DB-9 port 2.

To connect an external controller to the half-Y distribution matrix:

Connect an RS-232 or RS-422 serial cable between the external controller and either DB-9 port.

The Transmit, Receive, and Ground pins must be run from the external controller to the haff-Y. Since the distribution matrix does not provide handshaking, use a null modem cable as shown in figures C.1 through C.4.

Note: Serial communication protocol is set at the factory when your matrix is ordered. Use serial cable that corresponds to the factory set communication protocol. If uncertain about the communication protocol, contact an authorized AutoPatch dealer.



figure C.1 232 communications for a 25-pin connector



figure C.2 232 communications for a 9-pin connector



figure C.3 232 communications for a Macintosh



figure C.4 422 communications for a 9-pin connector

After the serial connections are made and the enclosure is powered, your matrix goes through its startup sequence.

Your *half-* Y is now ready for operation via the DB-9 port.

C.2 Operating Serial Controllers

An external controller is any device capable of sending ASCII characters serially. External serial controllers may also receive information from the matrix via the DB-9 port. Examples of external controllers are PC or Macintosh computers, and third party serial control devices. The *half*-Y can optionally support up to two external serial controllers.

Each type of external controller is specialized for different types of applications, but they all allow remote access to the distribution matrix.

C.2.1 Entering BCS Commands

AutoPatch Distribution matrices are programmed using a set of ASCII characters called Basic Control Structure (BCS). BCS command syntax is designed to parallel the operations of the control panel. So instead of pressing the keys on the control panel, press the keys on the external serial controller keypad. The *half*- Y serial protocol is as follows:

- □ 9600 baud
- □ 8 data bits
- □ 1 stop bit
- □ No parity

All BCS entries must be complete commands. Terminate any incomplete or erroneous commands with an 'X' (Cancel) and then re-type the command. Typing a space or a backspace does not cancel a previous command.

The following table shows the BCS commands available for your half-Y.

Key	Function	Description
X	Cancel	Cancels the previous incomplete com- mand
Т	Take	Executes commands
S	Status	Allows you to check the status of the <i>half-Y</i> 's input and output locations
L	Level	Level refers to either the upper or lower level
C	Change	Change command
Ι	Input	Input number entry
0	Output	Output number entry
'' or ,	Space or Comma	A delimiter for separating multiple input and output entries
'0' - '9'	Number	Digits used to define inputs and outputs
D	Disconnect	Disconnects an input or an output

To make a switch using BCS commands:

Enter the correct string of BCS commands for the switch you want to make. Every switch command must begin with 'C' and end with 'T'. To delete errors in your string, enter an 'X' and re-enter your entire command string. The 'X' cancels every portion of the command string that came before it.

One advantage of using BCS commands is that you can enter multiple commands in the same string. For example, you can switch level 1, input 1 to level 1, outputs 1 and 2 with one command string. That command string would look like this:

CL1I101 2T

To disconnect a switch using BCS commands:

Every disconnect command string must begin with 'D' and end with 'T'. In a disconnect command string, specify the level and input *or* output you want disconnected. If no level is specified, the input or output is disonnected on *all* levels. Enter the correct string of BCS commands for the input or output you want to disconnect. To delete errors in your string, enter an 'X' and re-enter your entire command string. The 'X' cancels every portion of the command string that came before it. You can disconnect level 1, outputs 1 and 2 with the following command string:

DL101 2T

C.2.2 BCS Software Handshaking

All AutoPatch software provides software handshaking. However, other software may not. If you are using something other than AutoPatch software, make sure it implements the following handshaking requirements.

Each character received by the distribution matrix CPU is echoed through the DB-9 port. When a switch is completed in the matrix, the BCS command 'T' is echoed. Your external serial control software must wait until it receives the echoed 'T' back from the CPU before it sends the next command. Waiting for the 'T' command prevents serial buffer overflow when software handshaking is unavailable.

C.3 Software

Control software allows your to use a PC to control your matrix through the DB-9 ports. AutoPatch offers control software that executes switches manually and automatically. Manual execution software implements commands as they are entered. Automatic execution software implements commands at the times they are scheduled to be executed. The manual execution software package is YRoute. The automatic execution software packages are AutoRoute Event Scheduler and ScanPatch.

C.3.1 YRoute

YRoute is a DOS-based software package that simulates all configuration operations, except checking the status of an input or output. Implement operations by entering the commands (at the top of the screen) at the option? prompt. Before using YRoute, familiarize yourself with the operation of your distribution matrix from the X/Y Control Panel. YRoute can only be run on a PC that uses RS-232 communications.

Note: Using YRoute requires an RS-232 cable with the hand shaking pins shorted. See figures C.1 - C.4 in the "Connecting Serial Controllers" section of this appendix.

C.3.2 AutoRoute Event Scheduler

AutoRoute Event Scheduler is a DOS-based control program that schedules events for matrix processing. Enter command lines in the string file, which is scheduled in the event file. The event file is processed by AutoRoute Event Scheduler. Processing the event file allows the software to change the distribution matrix configuration according to user defined parameters, including command and event timing. AutoRoute Event Scheduler can handle up to 100 events and 100 strings. The strings can recur in intervals of one second to one year.

Note: AutoRoute Event Scheduler software requires a PC that uses RS-232 communications; see figures C.1 - C.4, in the "Connecting Serial Controllers" section of this appendix.

C.3.3 ScanPatch

ScanPatch is a DOS-based control program that cycles I/O configurations. Each output has a set of assigned inputs that are cycled through it. Each ScanPatch session can handle up to 128 outputs, with a set of inputs for each output. Each set can contain no more than 40 inputs. You can predefine the length of a ScanPatch session or let it run until you need or want to terminate it.

Note: ScanPatch software requires a PC that uses RS-232 communications; see figures C.1 - C.4 in section the "Connecting Serial Controllers" section of this appendix.

Appendix D – Product Specifications

D.1Physical Features

Height	1 ru		
Width	17 inches (43.18 cm)		
Depth	6.75 inches (17.14 cm)		
Weight	3.5 lb (1.6 kg)		
Mounting options	 Standard 19 in. EIA rack Desktop 		
Connectors	 BNC for video 3-position terminal block for audio RCA for audio and video 		
Control options	 Local X/Y Control Panel Serial Controller (RS-232) Both 		
Serial protocol	RS-232 9600 baud, 8 data bits, 1 stop bit, no parity		
D.2Signals			
Combinations	 Video only Audio only Video and audio (in any case, audio can be mono or stereo) 		
D.3Power			
Voltage requirements	100-250 VAC at 1.6 Amp for 50/60/440 Hz 120-300 VDC at 1 Amp		

Glossary

- Basic Control Structure (BCS) A string of alphanumeric ASCII characters used to serially control the matrix from a PC keyboard. BCS commands can be used to execute any command that can be keyed-in from the control panel.
- BAUD rate The speed that communications travel through the DB-9 port. A *half*-Y can send and receive communications at 9600 BAUD.
- Board The *half*-Y contains up to two I/O (Input/Output) boards. The upper board is referred to as level 1 and the lower board is referred to as level 2. See also Level
- Com Port Refers to the communications port, or DB-9 port. The term com port is used in several of the software packages and devices used to control the matrix. The haff- Y comes with zero to two com ports.
- Component Signals Groups of signals that are switched together because each signal carries a necessary component for that group of signals to be recognizable. Some examples of component signals are: RGBS video, RGsB video, Y-c video, and stereo audio. Each signal in a component signal travels through a separate wire or cable, but all signals are switched together so that they arrive at the output device at the same or virtually the same time.
- Connector Assembly An adapter that allows the audio, video, or data signals to pass from a source device to the input board, or from the output board to the destination device.
- Distribution Matrix The environment of all signals and the hardware and software necessary to switch these signals. Distribution matrices are also known as routing switchers, routing matrices, and switching matrices.
- Enclosure An enclosure is a metal chassis which holds input and output boards, a CPU, and a power supply. Each enclosure can contain up to two I/O boards providing a total capacity of up to 12 input and 4 output signal paths.
- External Controller An external controller can be any device that can be used to control the matrix via the DB-9 port or other means.
- Input/Output (I/O) Configuration The status of all the input and output signals in the matrix at a given time. For example, the status of an input signal is the output signal to which it is routed and the status of an output signal is the input signal that it receives.
- Input/Output Board A circuit board that receives audio, video, or data signals from outside sources and transmits the signals to outside output devices.

- Inputs and Outputs inputs and outputs are the physical connector locations on the rear of an enclosure. Each enclosure holds a maximum of 12 inputs and 4 outputs.
- Level The half-Y uses the term level to refer to either the upper or lower I/O board. Levels are used for signal breakaway.
- Local X/Y Control Panel The panel on the front of an enclosure that has operation keys. Almost all distribution matrices will have at least one enclosure with a control panel.
- Module Also known as a software module. A module is a chunk of software code that allows the matrix to accomplish specific tasks.
- RGBS A four input video signal; R = Red, G = Green, B = Blue and S = sync. This signal requires four literal inputs to relay it to an output device.
- RGsB A three input component video signal, R = Red, G = Green with (s) sync, and B = Blue. This signal requires four literal inputs to relay it to an output device.
- Single Bus Controllers (SBC) SBCs are remote controller devices used to control the input to a specified output device.

Software Module - A software module is a chunk of software code that allows the matrix to perform specific tasks.

Strings - Basic Control Structure (BCS) commands are referred to as strings.

Switch - Any time the input/output configuration is altered, a switch is performed. Switches can be made from the control panel or an external controller.

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Differential Audio Supplement for the *half*-Y User Reference Manual version A0

To handle differential audio signals we offer a *half-*Y that has pluggable 5-position block terminal connectors. The figure below displays differential audio input and output connections for both stereo and mono audio signals.

Note: To help alleviate low frequency noise problems in audio system twisted pair interconnections, connect the shield at one end only.





Differential stereo and mono audio connections