



Pathfinder Matrix Serial Protocol

10/7/2010



Based on MU Firmware version 3.03

1 Contact and Warranty Information

Copyright

© FSR Inc. October 7, 2010 12:36 PM

All rights reserved. No part of this document may be copied, reproduced or translated. It shall not otherwise be recorded, transmitted or stored in a retrieval system without the prior written consent of FSR.

Notice

FSR provides this manual “as is” without warranty of any kind, either expressed or implied, including but not limited to the implied warranties or merchantability and fitness for a particular purpose. FSR may make improvements and/or changes to the product(s) and/or the program(s) described in this publication at any time without notice.

This publication could contain technical inaccuracies or typographical errors. Changes are periodically made to the information in this publication; these changes are incorporated in new editions of this publication.

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the user will be responsible for correcting any interference.

Guarantee and Compensation

FSR provides a guarantee relating to perfect manufacturing as part of the legally stipulated terms of guarantee. On receipt, the purchaser must immediately inspect all delivered goods for damage incurred during transport, as well as for material and manufacturing faults FSR must be informed immediately in writing of any complaints.

The period of guarantee begins on the date of transfer of risks, in the case of special systems and software on the date of commissioning, at latest 30 days after the transfer of risks. In the event of justified notice of compliant, FSR can repair the fault or provide a replacement at its own discretion within an appropriate period. If this measure proves to be impossible or unsuccessful, the purchaser can demand a reduction in the purchase price or cancellation of the contract. All other claims, in particular those relating to compensation for direct or indirect damage, and also damage attributed to the operation of software as well as to other services provided by FSR, being a component of the system or independent service, will be deemed invalid provided the damage is not proven to be attributed to the absence of properties guaranteed in writing or due to the intent or gross negligence or part of FSR.

If the purchaser or a third party carries out modifications or repairs on goods delivered by FSR, or if the goods are handled incorrectly, in particular if the systems are commissioned operated incorrectly or if, after the transfer of risks, the goods are subject to influences not

agreed upon in the contract, all guarantee claims of the purchaser will be rendered invalid. Not included in the guarantee coverage are system failures which are attributed to programs or special electronic circuitry provided by the purchaser, e.g. interfaces. Normal wear as well as normal maintenance are not subject to the guarantee provided by FSR either.

The environmental conditions as well as the servicing and maintenance regulations specified in this manual must be complied with by the customer.

Warranty

All video products are designed and tested to the highest quality standards and are backed by a full 3-year parts and labor warranty. Warranties are effective upon delivery date to customer and are non-transferable. FSR warranties are only valid to the original purchaser/owner. Warranty related repairs include parts and labor, but do not include faults resulting from user negligence, special modifications, lightning strikes, abuse (drop/crush), and/or other unusual damages.

The customer shall pay shipping charges when unit is returned for repair. FSR will cover shipping charges for return shipments to customers.

Return Material Authorization (RMA)

In the unlikely event that a product is required to return for repair, please call the following number and ask for a Sales Engineer to receive a Return Merchandise Authorization number (RMA).

- (973) 785-4347

RMA Conditions are listed below:

- a. Prior to returning any item, you must receive a Return Merchandise Authorization (RMA) number.
- b. All RMA numbers must appear on their return-shipping label.
- c. RMA numbers are valid for ten (10) days from issue date.
- d. All shipping and insurance charges on all RMAs must be prepaid by the customer

Trademarks

Brand and product names mentioned in this manual may be trademarks, registered trademarks or copyrights of their respective holders. All brand and product names mentioned in this manual serve as comments or examples and are not to be understood as advertising for the products or their manufactures.

Company Address



FSR Inc.
244 Bergen Blvd.
West Paterson, NJ 07424
USA

- Phone: (973) 785-4347
- Fax: (9) 785-4207
- Website: www.fsrinc.com

Operators Safety Summary

The general safety information in this summary is for operating personnel.

Do Not Remove Covers or Panels

There are no user-serviceable parts within the unit. Removal of the top cover will expose dangerous voltages. To avoid personal injury, do not remove the top cover. Do not operate the unit without the cover installed.

Power Source

This product is intended to operate from a power source that will not apply more than 230 volts rms between the supply conductors or between both supply conductor and ground. A protective ground connection by way of grounding conductor in the power cord is essential for safe operation.

Grounding the Product

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective-ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Use the Proper Power Cord

Use only the power cord and connector specified for your product. Use only a power cord that is in good condition. Refer cord and connector changes to qualified service personnel.

Use the Proper Fuse

To avoid fire hazard, use only the fuse having identical type, voltage rating, and current rating characteristics. Refer fuse replacement to qualified service personnel.

Do Not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an explosive atmosphere.

Terms In This Manual and Equipment Marking



WARNING

Highlights an operating procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury to or death of personnel.

Note

Highlights an essential operating procedure, condition or statement.



CAUTION

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



AVERTISSEMENT!

Le point d'exclamation dans un triangle équilatéral signale à alerter l'utilisateur qu'il y a des instructions d'opération et d'entretien très importantes dans la littérature qui accompagne l'appareil.



VORSICHT

Ein Ausrufungszeichen innerhalb eines gleichwinkligen Dreiecks dient dazu, den Benutzer auf wichtige Bedienungs- und Wartungsanweisungen in der dem Gerät beiliegenden Literatur aufmerksam zu machen.

Change History

RECORD OF CHANGES

REV #	DATE	ECO #	DESCRIPTION	Approved By
1.03	8/7/07	-	Revised Sec 5 Error Response and Sec 30 Volume Request	JES
1.04	10/7/10		Added additional Pathfinder models	JES

TABLE OF CONTENTS

1	CONTACT AND WARRANTY INFORMATION	3
2	GENERAL NOTES.....	11
2.1	OUTPUT LEVEL RANGE:	11
2.2	INPUT TRIM RANGE:.....	11
2.3	SERIAL PORT SETTINGS:	11
2.4	REFERENCING VIDEO CARDS:	11
2.5	MATRIX TYPES.....	11
3	UPDATING PATHFINDER MATRIX SOFTWARE.....	12
4	REQUEST/RESPONSE FORMAT	13
4.1	FIELD SEPARATORS	13
4.2	COMMAND REQUEST SYNTAX:	13
4.3	COMMAND REQUEST COMMENT FIELDS.....	13
5	ACKNOWLEDGING RECEIPT OF COMMANDS	15
6	ERROR RESPONSE.....	15
7	PATHFINDER MATRIX CONFIGURATION.....	17
8	SPLIT MODE.....	18
8.1	RGB/COMPONENT MATRIX	18
8.2	SVIDEO MATRIX.....	19
9	PATHFINDER MATRIX REQUEST LIST QUICK REFERENCE	20
10	AUDIO TYPE.....	21
11	CABLE LENGTH REQUEST	22
12	CONFIGURATION REQUEST	23

13	CONNECTION REQUEST.....	25
14	DELAY REQUEST	27
15	DISCONNECT REQUEST	28
16	ECHO COMMANDS REQUEST.....	29
17	FRONT PANEL LOCK/UNLOCK REQUEST.....	30
18	HELP REQUEST	31
19	INPUT/OUTPUT REQUEST FORMAT.....	36
20	MODEL REQUEST.....	37
21	MUTE REQUEST	40
22	SET INPUT/OUTPUT NAME REQUEST.....	41
23	PRESET REQUEST	42
24	PASSWORD REQUEST.....	44
25	RGB DELAY REQUEST.....	45
26	RESPONSE REQUEST.....	45
27	RETURN TO FACTORY DEFAULTS REQUEST	46
28	STATUS REQUEST	47
29	SET TIME AND DATE REQUEST.....	50
30	OUTPUT SYNC EQU REQUEST	51
31	VERSION REQUEST	52
32	VOLUME REQUEST	53
33	VERBOSE REQUEST	54

2 General Notes

2.1 Output Level Range:

Output level range -45 dB to +5dB in one dB steps.

2.2 Input Trim Range:

Input trim range -10 to +10 dB in one dB steps.

2.3 Serial Port Settings:

The serial protocol is 38400 baud, 8 bits, 1 stop, no parity, no flow control. Only TX, RX, and GND pins are used on the female 9-pin D-Sub connector. The Pathfinder Matrix is a DCE device (receiving from a PC) and will receive on pin 3, and send on pin 2, pin 5 (GND) is the only other pin used on the 9-pin D-Sub connector.

2.4 Referencing Video Cards:

The Pathfinder Matrix will be able to split the video cards into different signal types. When this occurs the following method will be used to reference the video cards:

If the matrix is configured as an RGB matrix:

The red video card will be referred to as the "A" video port.

The green video card will be referred to as the "B" video port.

The blue video card will be referred to as the "C" video port.

If the matrix is configured as a Component matrix:

The Y video card will be referred to as the "A" video port.

The U(Pr) video card will be referred to as the "B" video port.

The V(Pb) video card will be referred to as the "C" video port.

If the matrix is configured as an S-Video matrix:

The Y video card will be referred to as the "A" video port.

The C video card will be referred to as the "B" video port.

Audio will always be referred to as the "F" card.

2.5 Matrix Types

An ASCII number will reference the four types of matrices. The reference numbers are as follows:

"1" = RGB

"2" = S-Video

"3" = Composite

"4" = Component

3 Updating Pathfinder Matrix Software

The user will be able to update the Pathfinder Matrix software, which will be done via a proprietary Visual Basic program. This function is not programmable by the user and will not be defined in this document.

4 Request/Response Format

All requests and responses are entirely in ASCII. This makes the Pathfinder Matrix easy to use with other control systems from AMX, Crestron, etc. The requests can be in either upper or lower case.

All requests/responses have a three character type field followed by the data required for that specific request/response. All requests are terminated with either a carriage return (0Dh), which are referred to in this document as `<cr>` or with a semi-colon character (;). The semi-colon permits the user to enter multiple commands in a single line of ASCII text. All responses are terminated with a carriage return `<cr>` and a line feed (0Ah) which will be referred as `<lf>`.

4.1 Field Separators

Fields are separated by *white* space, that is any number of spaces or tabs as long as the entire command is less than 256 characters. A `<cr>` terminates the command. Below is an example describing a command.

EX	05	<cr>
----	----	------

So the actual message would look like this:

EX 05<cr>

4.2 Command Request Syntax:

This document uses the following notation when describing the syntax of a command request:

BOLD – identifies the command

lower case – identifies data to be entered which is described in the text following the syntax description

“ ” - entry defined within double quotes is to be entered exactly as shown

< > - entry defined within these brackets is required

[] - entry defined within these brackets is optional

{ } - entry defined within curly brackets must be entered at least once

| - a vertical bar denotes a logical choice of entry

* - an asterisk following either [] brackets or curly brackets { } above denotes that data within either brackets or curly brackets may be entered multiple times.

number sequence – this refers to a single number or a sequence of numbers, each number separated from the next by a comma and may also include a range of numbers (e.g. 1,3,5,7-11, 12, 16)

4.3 Command Request Comment Fields

The ASCII syntax of the request protocol accommodates the ability to optionally insert comments into the Command Request. Comments must be enclosed within the # character. This feature was intended to facilitate user descriptions of the audio and video which they are configuring but may, of course, be used however the user sees fit. The

comments are ignored by the Pathfinder Matrix but, of course, add to serial transmission overhead.

Example:

Below is an example of uncommented connection commands.

```
CON 1 (1) 2 (2-4) 1F(1)<cr>  
VOL L 1 -45<cr>
```

The above could have comments added as follows:

```
CON 1 # Sony DVD # (1) 2 (2-4) # Configures training rooms A,B, and C #<cr>  
VOL L 1 -45 # Initialize output 1 to floor of -45 dB #<cr>
```

5 Acknowledging Receipt of Commands

Each request sent to the Pathfinder Matrix have by default two possible responses, an acknowledgement of a correct request or an error response. The acknowledge response will be:

```
Ok<cr><lf>.
```

The Pathfinder Matrix may also be configured via command (see below) to suppress all responses. The user should exercise care when configuring no response as the user will obviously have no feedback as to the success of the command.

The user may also wish to receive an echo of the command that was sent along with the acknowledgement. This is configurable via the ECH command (see below). Echoing of commands may be of use to serial users attempting to distinguish the original command to which an acknowledgement has been sent. An example appears below of a command and the echoed response.

Command:

```
CON 1 (1) 2 (3-5)<cr>
```

Response with echo:

```
CON 1 (1) 2(3-5)<cr><lf>
```

```
Ok<cr><lf>
```

6 Error Response

In the event an invalid *command* is sent to the Pathfinder Matrix, it will respond with the message “**ERR: unknown command**“. If an invalid parameter is sent to the Pathfinder Matrix, the unit will respond with the message “**ERR:** “ followed by the valid syntax for the errored entry.

Example:

A connect request with an incorrect input number:

```
CON 0 (8)<cr>
```

The error response would be:

```
ERR: CON {<input>[card specifier] <“(numberSequence)”>}*<cr>
```

Note that the returned error response may be expanded to a more detailed version by entering *verbose mode*. This mode may be turned on by issuing a **VRB Y** command. The expected syntax for the command will be returned, as above, and a description of each parameter.

For example, if verbose mode were turned on and the above command issued, the response would be:

```
ERR: CON {<input>[card specifier] <“(numberSequence)”>}*<cr>
```

```
CON {<input>[card specifier] <“(numberSequence)”>}*<cr>
```

```
Connect the specified input to specified output.
```

input	Input number in the range 1 – max inputs
card specifier	optional indicator of the card type with “A”, “B” or “C” (applicable to split mode) designating video and “F” designating audio.
numberSequence	Outputs as number sequence in range 1 - max outputs.

7 Pathfinder Matrix Configuration

During production the unit will be configured with a configuration file that will contain matrix type, total inputs, total outputs, volume calibration, and serial number. This eliminates the need for jumpers or dipswitches.

8 Split Mode

The video cards on the matrix contain inputs and outputs, signals that enter through an input can only be switched to outputs on the same physical card. The design of the video boards does not allow switching signals between video cards.

The majority of users will use the matrix for the flavor it was built for. That is, all RGB, all SVideo, all Component or all Composite. There is no special setup required to describe the inputs and outputs in their native signal types as each input and output default type is its native type. However, some users might wish to use unallocated constituent video signals, say for RGB for other signal types such as Svideo or Composite. This is known as *split mode*.

The user will be able to split the inputs/outputs of a RGB, Component or SVideo matrix. The inputs/outputs on a RGB matrix will default to Red, Green, and Blue components, but they may be defined as representing combinations of composite and/or the two Svideo signals. Component matrices signals may be split in the same way as with RGB. The SVideo matrix will default to Svideo but may also be defined as split into two composite video signals. Composite video matrixes, however, cannot be split.

One basic recommendation is that if you assign the 2 SVideo components (“Y” and “C”) to the green and blue cards on an RGB matrix, then any other SVideo inputs or outputs should also be assigned to the green and blue video cards. The user can still use the red card for composite. This will take some of the complication out of the setup process.

It is important that the user realize one very hard and fast rule; that inputs defined as residing on a video card can **ONLY** be connected to an output residing on that same card. This is because the representative A, B, and C input signals are only physically connected to their respective output card type. For example if input 14 is defined as a composite video on the red video card it can only be connected to an output that is also a composite video residing on the red video card. The same goes for SVideo, if input 16 is defined as a SVideo on the green/blue video cards it can only be connected to an SVideo output on the green/blue video card. Failure to follow this rule will result in unexpected results.

8.1 RGB/Component matrix

If the matrix is an RGB the user can define the three video cards as Component. However, a Component matrix cannot have RGB video defined on it since the Component matrix doesn't have the sync cards necessary to handle RGB.

If the matrix is an RGB the user can define one card for composite video, and the remaining two for SVideo. If the user uses the red card for composite video it would make sense that all subsequent composite video inputs or outputs should reside on the red card. The user has the same rule with SVideo, if the user defines green/blue card input for SVideo, then all SVideo inputs or outputs should be on the green/blue boards. If the user on a RGB Pathfinder Matrix uses green/blue for SVideo then the red card may be used for composite video.

The only definition that is not allowed on a RGB matrix is S-Video on the red and blue video cards.

8.2 SVideo matrix

If the Pathfinder Matrix is an SVideo matrix, the user can define composite videos on either card but can only switch inputs to outputs on the same card.

9 Pathfinder Matrix REQUEST LIST QUICK REFERENCE

REQUEST	DESCRIPTION
AVT	Audio type selection
CBL	Cable length configuration
CFG	Configuration Request
CON	Connection Request
DEL	Delay Request
DIS	Disconnect Request
ECH	Echo Commands Request
FPL/FPU	Front Panel Lock/Unlock Request
HLP	Help
INP	Input port Setup
MOD	Model request
MUT	Mute
NAM	Assign names to inputs and outputs
OUT	Output port setup
PST	Preset Requests
PSW	Password request
RSP	Response
RGB	RGB Delay Request
STA	Status Requests
STD	Set time/date
SYN	Sync Equalization
VER	Request version numbers
VOL	Volume request
VRB	Verbose

10 Audio Type

The user will be able to select the type of audio input, Professional or Consumer, with the AVT request. Factory default setting is Consumer for all inputs. The format of the AVT request is as follows:

AVT	"P" "C"	inputSequence	<cr>
-----	---------	---------------	------

Syntax: AVT <"P"|"C"> <inputSequence><cr>

Where:

AVT Audio type request
"P"|"C" P for professional, C for Consumer
inputSequence Input *number sequence* in range of number of inputs

Example:

AVT P 1, 4-8

Sets inputs 1 and 4 thru 8 to professional.

11 Cable Length Request

The cable length request gives the user the ability to set the length of cable from the unit to the display for outputs or the length of cable from the source to the unit. The settings are from 0 to 150 feet in increments of 10 feet represented by the values 0-15. Zero feet is off. Factory default setting is a length of 0 for all inputs and outputs. The format of the cable length request is as follows:

CBL	"I" "O"	length "?"	numberSequence	<cr>
------------	-----------	--------------	----------------	------

Syntax: CBL <"I"|"O"> <length|"?"> <numberSequence><cr>

Where:

CBL Cable length request header
"I" | "O" I=Input, O=Output
length 0 (off) to 15 representing 10' increments, or "?" for inquiry
numberSequence The input or output *number sequence* being assigned a length.

Example:

`CBL I 5 2,4-6<cr>`

Sets inputs 2, 4, 5, and 6 to a cable length of 50 feet.

12 Configuration Request

The Configuration request is used to obtain the matrix model number. The matrix model number describes the number of inputs and outputs, the type of the matrix, audio functionality, and equalization functionality.

The format for the configuration request is as follows:

CFG	<cr>
------------	-------------------

Syntax: CFG<cr>

Where:

CFG Configuration request

Example:

CFG<cr>

For a 16x8 RGB matrix with audio and equalization functionality the response will be:

PFD-16x8-RGBAEQ

The returned text will be *exactly* one of the following:

PFD-8x4-RGB
PFD-8x4-RGBA

PFD-8x8-C
PFD-8x8-CA
PFD-8x8-S
PFD-8x8-SA
PFD-8x8-HD
PFD-8x8-HDEQ
PFD-8x8-HDA
PFD-8x8-HDAEQ
PFD-8x8-RGB
PFD-8x8-RGBEQ
PFD-8x8-RGBA
PFD-8x8-RGBAEQ

PFD-12x8-C
PFD-12x8-CA
PFD-12x8-S
PFD-12x8-SA
PFD-12x8-HD
PFD-12x8-HDEQ
PFD-12x8-HDA
PFD-12x8-HDAEQ
PFD-12x8-RGB

PFD-12x8-RGBEQ
PFD-12x8-RGBA
PFD-12x8-RGBAEQ

PFD-16x8-C
PFD-16x8-CA
PFD-16x8-S
PFD-16x8-SA
PFD-16x8-HD
PFD-16x8-HDEQ
PFD-16x8-HDA
PFD-16x8-HDAEQ
PFD-16x8-RGB
PFD-16x8-RGBEQ
PFD-16x8-RGBA
PFD-16x8-RGBAEQ

PFD-16x16-C
PFD-16x16-CA
PFD-16x16-S
PFD-16x16-SA
PFD-16x16-HD
PFD-16x16-HDEQ
PFD-16x16-HDA
PFD-16x16-HDAEQ
PFD-16x16-RGB
PFD-16x16-RGBEQ
PFD-16x16-RGBA
PFD-16x16-RGBAEQ

PFD-24x16-RGB
PFD-24x16-RGBA

PFD-24x24-RGB
PFD-24x24-RGBA

PFD-32x16-RGB
PFD-32x16-RGBA

PFD-32x32-RGB
PFD-32x32-RGBA

13 Connection Request

The connection request is used to connect an input to one or more outputs. The unit checks the signal type of the input and output and if they are compatible then the unit connects them. (By default, the signal inputs and outputs are compatible as they represent their native matrix type. Only when inputs and outputs are designated as *split* using the INP/OUT request does this present a concern.) Connections may be disconnected by using the **DIS** command (see later in document).

CON	input[card specifier]	“(“numberSequence”)”	<cr>
------------	-----------------------	----------------------	------

Syntax:

CON {<input>[card specifier] <“(“numberSequence”)”>}* <cr>

Where:

CON	Connection request header
input	Input number in the range 1 – max inputs.
card specifier	Optional indicator of the card type with “A”, “B” or “C” (applicable to <i>split mode</i>) designating video, and “F” designating audio.
numberSequence	Outputs as a <i>number sequence</i> .

Split Video Connections

The connection request can be used to connect split inputs and outputs. For split video connection requests the user needs to specify “A”, “B”, or “C” following the input number followed by the output number being connected. The output number need not contain the card specifier since if the output has been previously identified as split using the OUT command and is of the same card type then the card specifier is understood to be the same as that designated with the input number. Audio connections may be thought of as ‘split’ and always residing on the “F” card, so audio connection inputs need to designate an F along with the input.

For example, if the user wanted to connect input 14A to output 14A and both have been previously defined as S-Video for instance then the user need only designate the “A” specifier on the input since the association to output on the A card is understood. If the user wanted to connect audio of input 10 then an “F” would have to be included for the input. If the requested input type is not compatible with any of the specified output types then the request will be rejected and an incompatibility error reported (see below).

To connect an input to multiple outputs separate the outputs with a comma. The last output is followed by a carriage return. Partially compatible connection requests will result in the entire request being rejected and an incompatibility error reported (see below).

Single Connection Example:

To connect input 5 audio to output 4 the connection request would look like this:
CON 5F (4)<cr>

Multiple Connection Example:

To connect input 10 video defined as its native matrix type to outputs 2, 4, 8 defined as the native matrix type the connection request would look like this:

```
CON 10 (2,4,8)<cr>
```

To connect audio input 3 to audio outputs 3, 4 and 11 send the following request:

```
CON 3F (3,4,11)<cr>
```

Multiple Connection Example (with multiple input designations):

To connect input 1 to output 3, input 4 to outputs 2,4, and 7, input 10 to outputs 8,9, and 10, the connection request would be as follows:

```
CON 1 (3) 4 (2,4,7) 10 (8,9,10)<cr>
```

Error Example:

The user attempts to connect input 1, previously defined as split, to outputs 8 and 9. with the following request:

```
CON 1 (8,9)<cr>
```

Since input 1 was previously defined as split then a card specifier is required to completely characterize the type of split connection being connected. The above command will result in the error response:

```
CON ERR: One or more incorrect connection specifications detected.
```

Split Video Examples

The following are examples of how to connect split video on the matrix. Note that prior to attempting split connections, the prospective split inputs and outputs to be connected must have been defined as split with the **INP** and **OUT** commands respectively.

Split Single Connection Example:

To connect input 5B video to output 4B the connection request would look like this:

```
CON 5B (4)<cr>
```

Note that the card specifier for output 4 is not designated since card B for output 4 has already been previously defined as the same type as that of 5B.

Split Multiple Connection Examples:

To connect input 5B previously defined as split S-Video to outputs 12B, 13B, and 16B previously defined as split S-Video, the user would issue this request:

```
CON 5B (12,13,16)<cr>
```

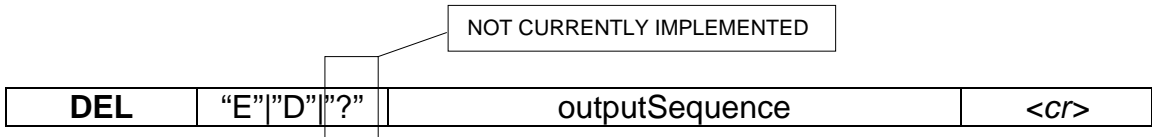
Split Multiple Connection Example (with multiple input designations):

To connect input 5B previously defined as split S-Video to outputs 12B, 13B, and 16B previously defined as split S-Video, input 7A previously defined as Composite to outputs 13A, 16A, and 17A previously defined as Composite, and input 6 audio to output 6 and 7 audio the user would issue this request:

```
CON 5B (12,13,16) 7A (13,16,17) 6F (6,7)<cr>
```

14 Delay Request

Some devices require a delay when switching RGB. The delay request enables or disables the delay for the output. Since this is a RGB function it will not be available on S-Video or composite ports.



Syntax: DEL <"E"|"D"|"?"> <outputSequence><cr>

Where:

DEL Delay request header
"E"|"D" E=Enable, D=Disable
outputSequence Output as a *number sequence*.
"?" Inquiry for the specified output number(s)

Example:

To enable RGB delay for outputs 2, 4, 10, 12-15, and 24 the user would send the following message:

```
DEL E 2,4,10,12-15,24<cr>
```

The matrix would respond to this message with an OK response.

The matrix will respond with this message to an inquiry of output 12 if output 12 was enabled.

```
DEL ? 12<cr>  
DEL E 12
```

To get the current status of all the output delays on a 16X8 matrix the user would send the following message:

```
DEL ? 1-8<cr>
```

The response would be the following if an output delay on outputs 1-4 are currently enabled and outputs 5-8 currently disabled.

```
DEL E 1,2,3,4 D 5,6,7,8
```

15 Disconnect Request

The Disconnect request is used to disconnect a specified output from its input. The unit checks the specified signal type of the output to ensure that it is indeed of that type before attempting to disconnect.

DIS	output[cardSpecifier][“,”output[cardSpecifier]	<cr>
------------	--	------

Syntax: DIS <output[cardSpecifier][“,”output[cardSpecifier]]* <cr>

Where:

DIS Disconnect request header
output Output being disconnected.
cardSpecifier Optional card specifier “A”, “B”, or “C” for split mode disconnects or “F” for audio disconnects.

Example:

To disconnect video outputs 1, 3, 5-9, all defined as non-split the user would send the following message:

```
DIS 1,3,5,6,7,8,9<cr>
```

To disconnect video outputs 1B, 3A, 4C (all defined as split), video outputs 2 and 5 (non-split), and audio output of 1 and 10, the user would send the following message:

```
DIS 1B,3A,4C,2,5,1F,10F<cr>
```

If the user attempted to disconnect a video output defined as split without the proper card specifier then an error would be reported. In the example below, the user attempts to disconnect output 10, defined as split with Composite on A card and S-Video on B and C cards.

```
DIS 10<cr>
```

```
DIS ERR: Ambiguous disconnect specification
```

If the user attempted to disconnect a video output defined as non-split with an optional card specifier, which in this case would be improper, then an error would be reported. In the example below, the user attempts to disconnect output 10B. Since output 10 is defined as non-split this generates an error response.

```
DIS 10B<cr>
```

```
DIS ERR: Improper disconnect specification
```

16 Echo Commands Request

This request allows the user to configure whether an echo of the originally received serial command is output back to the sender. Echoing of commands may be of use to serial users attempting to distinguish the original command to which an acknowledgement has been sent. Echo of commands defaults to OFF and is reset to OFF on a power cycle. The format for this request is as follows:

ECH[O]	"ON" "OFF"	<cr>
---------------	-------------------	-------------------

Syntax: ECH[O] <"ON"|"OFF"><cr>

Where:

ECH Echo request header.
"ON"|"OFF" ON to enable echo, OFF to disable.

Example:

To enable echoing of commands the user would send the following message:

ECH ON<cr>

The matrix will respond with an Ok message.

To disable echoing of commands:

ECH OFF<cr>

17 Front Panel Lock/Unlock Request

This request is used to disable/enable configuration of the Pathfinder Matrix via the Front Panel interface. When the Front Panel is locked a message will be displayed on the FP interface screen indicating such and all button action will be disabled. It may only be unlocked via the appropriate serial request. Front Panel use defaults to unlocked and is reset to unlocked on a power cycle.

The format for this request is as follows:

FPL	FPU	<cr>
------------	------------	-------------------

Syntax: FPL | FPU<cr>

Where:

FPL Lock the Front Panel interface.

FPU Unlock the Front Panel interface.

Example:

To lock the Front Panel interface the user would send the following message:

FPL<cr>

The matrix will respond with an Ok message.

To unlock the Front Panel Interface:

FPU<cr>

18 Help Request

The user will be able to request a list of the valid commands with descriptions and formats. The format for this request is as follows:

HLP	[cmd]	<cr>
------------	-------	------

Syntax: HLP [cmd]<cr>

Where:

HLP Help Request header
cmd optional command identifier

If the optional **cmd** is omitted, the matrix will respond with the following text message:

AVT	Audio type selection
CBL	Configures cable length
CFG	Configuration request
CON	Connection request
DEL	Delay enable/disable request
DIS	Disconnect request
ECH	Echo request
FPL	Front Panel lock-out request
FPU	Front Panel unlock request
HLP	Help
INP	Input setup request
MOD	Model number identification
MUT	Mute output volume
NAM	Assign names to inputs and outputs
OUT	Output setup request
PST	Preset requests
PSW	Secure data access request
RFD	Return to Factory Default Request
RGB	RGB Delay request
RSP	Response from Matrix request
STA	Status requests
STD	Set time/date
SYN	Sync equalization request
VER	Version Numbers
VOL	Volume request
VRB	Verbose

Entering **HLP <cmd><cr>**, where **cmd** is any valid Matrix command in the above list, will return specific help syntax for the command requested. If the user would like more detailed help for a specific command then it is necessary to turn on *verbose mode* using the **VRB Y** command syntax. This will enable returning a description of the parameters of any specific command. The user may return to *non-verbose mode* by issuing the **VRB N** command.

Specific command help is listed below:

AVT <"P"|"C"> <inputSequence><cr>

Select the type of audio for the specified input.

"P"|"C" P for professional, C for Consumer

inputSequence Input *number sequence* in range of number of inputs

CBL <"I"|"O"> <length|"?"> <numberSequence> <cr>

Configure cable lengths.

"I" | "O" I=Input, O=Output

length 0 (off) to 15 in 10' increments, or "?" for inquiry

numberSequence The input or output *number sequence* being assigned a length.

CFG <cr>

Returns formatted text describing the matrix configuration.

CON {<input>[card specifier] <"("numberSequence")">}*<cr>

Connect the specified input to specified output.

input Input number in the range 1 – max inputs

card specifier optional indicator of the card type with "A", "B" or "C" (applicable to split mode) designating video and "F" designating audio.

numberSequence Outputs as number sequence in range 1 - max outputs.

DEL <"E"|"D"|"?"> <outputSequence><cr>

Enable/Disable delays for specified outputs.

"E"|"D" E=Enable, D=Disable

outputSequence Output as a *number sequence*.

"?" Inquiry for the specified output number(s)

DIS <output[cardSpecifier][","]output[cardSpecifier]]*<cr>

Disconnect specified outputs.

output Output being disconnected.

cardSpecifier Optional card specifier "A", "B", or "C" for split mode disconnects or "F" for audio disconnects.

ECH[O] <"ON"|"OFF"><cr>

Enable/disable echoing of commands.

"ON"|"OFF" ON to enable echo, OFF to disable.

FPL | FPU<cr>

Front Panel Lock/Unlock command.

HLP [cmd]<cr>

Provides help for Pathfinder Matrix command set.

cmd optional command identifier

INP | OUT <number> {<"A"|"B"|"C"><":"><type>}*<cr>

Specifies input or output configuration applicable to split mode.

number Input or output number.

"A"|"B"|"C" A=R card, B=G card, C=B card for RGB matrix
A=Y card, B=U card, C=V card for Component matrix
A=Y card, B=C card for S-Video matrix
type 1=RGB, 2=S-Video, 3=Composite, 4=Component

MOD <"modelType"><cr>
Specifies the model type of the matrix.
"modelType" The model type string per pre-specified allowed values.

MUT <"M"|"U"> <outputSequence><cr>
Mutes or unmutes the specified output.
"M"|"U" M=mute, U=unmute
outputSequence Output as *number sequence* to be muted/unmuted.

NAM <"I"|"O"> <number> <name|"?"><cr>
Assigns an ASCII string to the specified input/output.
"I"|"O" I for input, O for output
number Input or output number
name Optionally (i.e. no ?) assign alphanumeric name 12 ASCII characters or less to specified input or output number enclosed with double quotes.
"?" Optionally inquire a previously specified assignment.

PST <"S"> <presetNumber>
<outputNumber[cardSpecifier]>[<"outputNumber[cardSpecifier]>"]* <cr>
Sets and saves the specified preset to memory.
"S" S=Save preset request
presetNumber Preset in range of 1 to 32.
outputNumber Output number 1 – max number of outputs.
cardSpecifier Optional card specifier if output is split.

PST <"R"> <number><cr>
Recalls a previously specified preset.
"R" R=Recall and execute preset request.
number Preset to recall.

PSW <"password"><cr>
password The preconfigured FSR password which allows access to reserved features. The password must be enclosed within single or double quotes.

RFD <"Y"|"N"><cr>
Return to factory default settings.
"Y"|"N" Y=return to factory defaults, N=don't return

RGB <time><cr>
Specify an RGB delay.
time Amount of time in tenths of seconds from 1 to 100 in ASCII.

RSP <"Y"|"N"><cr>

Allows suppression of serial responses from matrix.

"Y"|"N" Y = response enabled, N = response disabled

STA <"I"|"O"> <number | "A"><cr>

Returns status for specified inputs or outputs.

"I"|"O" I input, O output

number Input or output number.

"A" A to designate all respective input or output.

Status returns the following if Input requested:

STA { <MatrixType> <InputNumber> <TrimValue> <SplitStatus> [CardSpecifier":"CardType] }*

MatrixType 1=RGB, 2=S-Video, 3=Composite, 4=Component

InputNumber The requested input.

TrimValue The trim value in range -10dB to +10dB for the specified

SplitStatus Y if split, N otherwise

CardSpecifier If split : A, B, or C specifying split signal type.

CardType If split: 2 designating S-Video or 3 designating Composite.

Status returns the following if Output requested:

STA { <MatrixType> <OutputNumber> <DelayStatus> <MuteStatus> <AudioLevel> <AudioInputConn> <SplitStatus> [<VideoInputConn> | [<CardSpecifier":"CardType", "VideoInputConn"]*] }*

MatrixType 1=RGB, 2=S-Video, 3=Composite, 4=Component

OutputNumber The requested output.

DelayStatus RGB delay, E=enabled, D=disabled.

MuteStatus M=Muted, U=Unmuted.

AudioLevel The audio output level for the specified output in range -45dB to +5dB.

AudioInputConn The audio input that the specified output is connected to, "255" if unconnected.

SplitStatus Y if split, N otherwise

VideoInputConn The video input that the specified output is connected to, "255" if unconnected.

CardSpecifier If split : A, B, or C specifying split signal type.

CardType If split: 2 designating S-Video or 3 designating Composite.

STD <time> <date><cr>

Sets the time and date.

time Time in format *hh:mm|p*

date Date in *mm/dd/yy* format

SYN <status> <outputSequence><cr>

Configure Sync equalization

status "0" for OFF, "1" for ON and "2" for AUTO.

outputSequence Output as a *number sequence*.

VER<cr>

Version request returns the following:

VER Matrix Test/Loader = <XX.xx>, Matrix App = <XX.xx>, FP Test/Loader = <XX.xx>, FP App = <XX.xx>

XX.xx XX = Major version number, xx = Minor version number.

VOL <"L"|"T"> <numberSequence> <value|"?"><cr>

Configures the audio output level or trim for the specified output or input.

"L" | "T" output Level or Trim

numberSequence The output *number sequence* if L specified or the input *number sequence* if T specified.

value Volume value -10 to +10 for trims, -45 to +5 for level (in 1 dB increments) or "+" to increment volume in 1 dB increments, or "-" to decrement volume in 1 dB decrements.

"?" Inquiry for the specified level or trim

VRB <"Y"|"N"><cr>

Enables or disables verbose mode.

"Y"|"N" Y turns verbose on, N turns verbose off.

19 Input/Output Request Format

This command allows configuration of the card type for inputs and outputs in preparation for making *split* connections. If the user doesn't intend to ever make split connections then this command may be ignored. The format of the request is as follows:

INP OUT	number	"A" "B" "C"	":"	type	<cr>
----------------	--------	-------------	-----	------	------

Syntax: INP | OUT <number> {<"A"|"B"|"C"><":"><type>}* <cr>

Where:

INP Specifies input configuration

OUT Specifies output configuration.

number The input/output number being configured, the range of which is dependent on the number of inputs and outputs of the matrix.

"A"|"B"|"C" A = R card, B = G card, C = B card for RGB matrix

A = Y card, B = U card, C = V card for Component matrix

A = Y card, B = C card for S-Video matrix

":" colon character ties the card type to the virtual matrix type

type 1 = RGB, 2 = S-Video, 3 = Composite, 4 = Component

Definitions of multiple cards in the same input or output will be separated by a space. A semicolon will separate multiple input and outputs definitions in the same request.

Example:

To assign input 14 green to S-Video the following command would be used.

```
INP 14 B:2<cr>
```

To assign output 15 red to composite the following command would be used:

```
OUT15 A:3<cr>
```

To assign input 15 red to composite, and green/blue to S-Video the following request would be sent:

```
INP 15 A:3 B:2<cr>
```

Since S-Video uses two video signals (luminance and chroma), defining the B (green) in the request above as S-Video means that the luminance will be on the green card and the chroma on the blue.

To assign output 15 red, green, and blue to composite the following request would be sent:

```
INP 15 A:3 B:3 C:3<cr>
```

Although the cards default to RGB on an RGB matrix, the user can still issue this request to return output 2 to its native RGB.

```
OUT 2 A:1 B:1 C:1<cr>
```

Multiple Example:

To assign input 15 red to composite, and green/blue to S-Video and output15 the same way the following request would be sent:

```
INP 15 A:3 B:2; OUT 15 A:3 B:2 <cr>
```

20 Model Request

The MOD Model request allows configuration of the model type of the matrix. This command is normally reserved for use by FSR technical personnel and as such the user must have logged in correctly with the PSW command. The format for the model request is as follows:

MOD	“”modelType”” ”?”	<cr>
------------	-------------------	------

Syntax: MOD <””modelType””|”?”><cr>

Where:

MOD

Model request header.

“?”

Inquire the Pathfinder matrix model number. Return string is in format as described below.

“”modelType””

The model type in a format defining the number of inputs and outputs, the video type, audio card presence, and/or equalization present. The modelType must be enclosed within single or double quotes. The modelType must be *exactly* one of the following:

PFD-8x4-RGB
PFD-8x4-RGBA

PFD-8x8-C
PFD-8x8-CA
PFD-8x8-S
PFD-8x8-SA
PFD-8x8-HD
PFD-8x8-HDEQ
PFD-8x8-HDA
PFD-8x8-HDAEQ
PFD-8x8-RGB
PFD-8x8-RGBEQ
PFD-8x8-RGBA
PFD-8x8-RGBAEQ

PFD-12x8-C
PFD-12x8-CA
PFD-12x8-S
PFD-12x8-SA
PFD-12x8-HD
PFD-12x8-HDEQ
PFD-12x8-HDA
PFD-12x8-HDAEQ
PFD-12x8-RGB
PFD-12x8-RGBEQ
PFD-12x8-RGBA
PFD-12x8-RGBAEQ

PFD-16x8-C

PFD-16x8-CA
PFD-16x8-S
PFD-16x8-SA
PFD-16x8-HD
PFD-16x8-HDEQ
PFD-16x8-HDA
PFD-16x8-HDAEQ
PFD-16x8-RGB
PFD-16x8-RGBEQ
PFD-16x8-RGBA
PFD-16x8-RGBAEQ

PFD-16x16-C
PFD-16x16-CA
PFD-16x16-S
PFD-16x16-SA
PFD-16x16-HD
PFD-16x16-HDEQ
PFD-16x16-HDA
PFD-16x16-HDAEQ
PFD-16x16-RGB
PFD-16x16-RGBEQ
PFD-16x16-RGBA
PFD-16x16-RGBAEQ

PFD-24x16-RGB
PFD-24x16-RGBA

PFD-24x24-RGB
PFD-24x24-RGBA

PFD-32x16-RGB
PFD-32x16-RGBA

PFD-32x32-RGB
PFD-32x32-RGBA

Example:

To configure the matrix model type as 16x8, RGB with audio present and equalization present the user would issue the following string from the list above.

`MOD "PFD-16x8-RGBAEQ"<cr>`

To obtain the model number the user would issue the following command:

`MOD ?<cr>`

For a 16x8 RGB matrix with audio and equalization functionality the response will be:

`PFD-16x8-RGBAEQ`

21 Mute Request

The user will be able to mute any audio output by sending the mute request: The format for the mute request is as follows:

MUT	"M" "U"	outputSequence	<cr>
------------	-----------	----------------	------

Syntax: MUT <"M"|"U"> <outputSequence><cr>

Where:

MUT Start of mute message
"M"|"U" M=mute, U=unmute
outputSequence Output as *number sequence* to be muted/unmuted.

Example:

MUT M 4<cr> – Mutes the audio output of output 4.
MUT U 8<cr> – Unmutes the audio output of output 8
MUT M 2,6,9,10<cr> Mutes audio outputs 2, 6, 9, and 10.

22 Set Input/Output Name Request

The user will be able to set a name for inputs, outputs, and groups. The name can be up to 12 ASCII characters long. All ASCII characters available on a typical keyboard are allowed *except the double quote character*. The name must be enclosed within double quotes. The set name request is formatted as follows:

NAM	"I" "O"	number	name "?"	<cr>
------------	---------	--------	----------	------

Syntax: NAM <"I"|"O"> <number> <name><cr>

Where:

NAM	Name request header
"I" "O"	I for input, O for output
number	Input or output number
name	Optionally (i.e. no "?") assign as many as 12 ASCII characters to specified input or output number. <i>The name must be enclosed within double quotes.</i>
"?"	Optionally inquire a previously specified assignment.

Example:

To name Input 2 "DVD1" the user would send the following message:

```
NAM I 2 "DVD1"<cr>
```

The matrix will respond with an OK response.

Example:

If the user needed the name for input 2 (from example above) the following request would be sent:

```
NAM I 2 ?<cr>
```

To which the matrix would respond:

```
NAM I 2 "DVD1"<cr>
```

23 Preset Request

There are times when the user will want to specify connections and audio output levels that can be recalled at a later time. These connections, stored in non-volatile memory, are called presets. There are 32 presets that may be defined.

Presets are specified using the PST S command using the syntax defined below. A Preset is composed by selecting a set of outputs, video and/or audio, (and thus their associated inputs) from the set of existing output connections. It is therefore a subset of the currently existing output connections from which it was selected. Audio levels for each selected audio output are captured as part of the preset. Once configured from the existing output connections, the preset is saved for later execution (using the PST X command below) and the user is free to modify the existing output connections to accommodate another preset definition as they like.

It is an error to attempt to include outputs as split that haven't been defined as split (via a previous OUT command) or to include outputs as non-split that have been split.

The format for the Preset Save message is as follows:

PST	"S"	presetNumber	outputNumber[cardSpecifier][","outputNumber[cardSpecifier]	<cr>
------------	-----	--------------	--	------

Syntax:

PST <"S"> <presetNumber>
<outputNumber[cardSpecifier]>[<","outputNumber[cardSpecifier]>]*<cr>

Where:

PST	Preset request header
"S"	S=Save preset request
presetNumber	Preset in range of 1 to 32.
outputNumber	Output number 1 – max number of outputs.
cardSpecifier	Optional card specifier if output is split.

Example:

If a user wanted to set preset 1 to include outputs 1, 3, 5F, 7A, 7C, 8B, 12A, and 15 then the user would issue the following message:

```
PST S 1 1,3,5F,7A,7C,8B,12A,15<cr>
```

NOTE: Each preset has each of its outputs initialized to disconnected. When a preset is defined using the PST S command only those outputs represented in the PST S command are retained for execution. All previously disconnected outputs in that preset are redefined as excluded from the preset. The initial disconnected state of an undefined preset allows the user to execute those presets with the PST G command below to disconnect all outputs.

A previously defined preset may be executed using the PST X command, the syntax of which appears below. The execute command results in the matrix output to input connections and audio levels being configured as defined in the preset.

PST	"X" "G"	Number	<cr>
------------	---------	--------	------

Syntax: PST <"X"|"G"> <number><cr>

Where:

PST	Preset request header
"X" "G"	X=Execute preset request for the specified number. G=Get preset settings request for the specified number (Not currently implemented).
number	Preset to recall in the range of 1 to 32.

Response for Preset Get request:

PST G <PresetNumber> [<InputNumber>[CardSpecifier]
 (“<OutputNumber>[“,”<OutputNumber>]*”)]* <cr>

Where:

<i>PresetNumber</i>	1 to 32 as originally identified by Number entry in request.
<i>InputNumber</i>	Input number which was part of original connection when preset originally set.
<i>CardSpecifier</i>	Card specifier indicating A,B,C if input split or F if audio.
<i>OutputNumber</i>	Output number to which the specified input is connected.

Note that the []* syntax in the response describes zero or more occurrences of the data enclosed within the curly brackets.

Note also that the output to the “G” message is presented in a format similar to that specified by the CON command.

Example: if the user previously made connections using the CON command to connect video input 3 to outputs 2,4,6,8, video input 2 to 1,3,5,7 and audio input 9 to 1-8 and defined preset 1 using the PST S command as below:

```
CON 3 (2,4,6,8) 2 (1,3,5,7) 9F (1-8)
PST S 1 1,2,3,4,5,6,7,8,1F,2F,3F,4F,5F,6F,7F,8F
```

Then issuing a PST G 1 command would return the following:

```
PST G 1 2 (1,3,5,7) 3(2,4,6,8) 9F (1,2,3,4,5,6,7,8)
```

24 Password Request

The PSW Password request allows access to additional special commands including, but not limited to, the MOD command to configure the model type of the matrix unit. This command is generally reserved for use by FSR technical personnel only. Once properly issued, enhanced access to the additional commands will expire after a period of X minutes of no serial traffic. Enhanced access also returns to the limited command set on a power cycle.

PSW	<code>""password""</code>	<code><cr></code>
------------	---------------------------	-------------------------

Syntax: PSW `<""password""><cr>`

Where:

PSW PSW password request header

password The preconfigured FSR password which allows access to reserved features. The password must be enclosed within single or double quotes.

Example:

To prepare the matrix for access to a special command set the user would send the following message:

`PSW "password"<cr>`

The matrix will respond with an Ok message.

25 RGB Delay Request

The RGB Delay request sets the amount of time to delay when switching RGB outputs.

RGB	time “?”	<cr>
------------	----------	------

Syntax: RGB <time|“?”><cr>

Where:

RGB RGB Delay request header
time Amount of time in tenths of seconds from 0 to 100 in ASCII.
“?” Inquiry of the currently specified RGB delay.

Example:

To set the RGB delay time to 7.5 seconds, the user would send the following message:
RGB 75<cr>

The matrix will respond with an OK message.

To get the RGB delay time the user would send the following request:

RGB ?<cr>

The matrix will respond with the following for a RGB time of 7.5 seconds:

RGB 75

26 Response Request

The user will be able to suppress all responses from the Pathfinder Matrix if they like. The user should ensure that all subsequent requests to the Pathfinder Matrix are properly formatted as it would be difficult to ascertain their correctness without a response. The format for the Response request is as follows:

RSP	“Y” “N”	<cr>
------------	---------	------

Syntax: RSP <“Y”|“N”><cr>

Where:

RSP Response Request header.
“Y”|“N” Y = response enabled, N = response disabled

Example:

RSP Y<cr> – Response requested.

RSP N<cr> – Response suppressed.

27 Return to Factory Defaults Request

The user can return the unit to factory defaults by issuing this command. The unit settings affected include cable lengths, RGB delay, Sync equalization, video and audio connections, audio output and trim levels, mute status, and IP address. After having issued this command, the user may query the unit settings via the Status Request command. *This command should be exercised with care.* The format for the Return-to-Factory-Defaults request is as follows:

RFD	"Y" "N"	<CR>
------------	----------------	-------------------

Syntax: RFD <"Y"|"N"><cr>

Where:

RFD Return-to-Factory-Defaults Request header.
"Y"|"N" Y = return to factory defaults, N = do not return to factory defaults

Example:

RFD Y<CR> – Return to factory defaults requested.

28 Status Request

The user will be able to request status of individual inputs and outputs, all inputs or all outputs.

STA	"I" "O"	number "A"	<cr>
------------	---------	------------	------

Syntax: STA <"I"|"O"> <number | "A"><cr>

Where:

STA	Status request header
"I" "O"	I input, O output
number	Input or output number.
"A"	A to designate all respective input or output.

Response for Input Status request:

STA <MatrixType> {<InputNumber> ("<CableLength>","<AudioType>","<TrimValue>","<SplitStatus>","[CardSpecifier":"CardType] "(")*

Where:

<i>MatrixType</i>	1 = RGB, 2 = S-Video, 3 = Composite, 4 = Component
<i>InputNumber</i>	The requested input or the enumerated input if "A" specified.
<i>CableLength</i>	Cable length in 10' lengths from 00 to 150
<i>AudioType</i>	P for Professional or C for Consumer
<i>TrimValue</i>	The trim value in range -10dB to +10dB for the specified <i>InputNumber</i> .
<i>SplitStatus</i>	Y if split, N otherwise
<i>CardSpecifier</i>	If split : A, B, or C specifying split signal type.
<i>CardType</i>	If split: 2 designating S-Video or 3 designating Composite. (Note that these are the only valid designations into which a signal may be split.)

Note that the { }* syntax in the response describes one or more occurrences of the data enclosed within the curly brackets. This captures multiple inputs in the response if an "A" for All was specified in the request. Each successive input will appear on a separate line.

Response for Output Status request:

STA <MatrixType> {<OutputNumber> ("<DelayStatus>","<MuteStatus>","<CableLength>","<SyncEqu>","<AudioLevel>","<AudioInputConn>","<SplitStatus> [<","VideoInputConn> | [<","CardSpecifier":"CardType","VideoInputConn>]*] }*

Where:

<i>MatrixType</i>	1 = RGB, 2 = S-Video, 3 = Composite, 4 = Component
<i>OutputNumber</i>	The requested output or the enumerated output if "A" specified.
<i>DelayStatus</i>	RGB delay, E=enabled, D=disabled.
<i>MuteStatus</i>	M=Muted, U=Unmuted.
<i>CableLength</i>	Cable length in 10' lengths from 00 to 150
<i>SyncEqu</i>	Output sync equalization setting, 0= off, 1=On, 2= auto.
<i>AudioLevel</i>	The audio output level for the specified output in range -45dB to +5dB.

<i>AudioInputConn</i>	The audio input that the specified output is connected to, "255" if unconnected.
<i>SplitStatus</i>	Y if split, N otherwise
<i>VideoInputConn</i>	The video input the specified output is connected to, "255" if unconnected.
<i>CardSpecifier</i>	If split : A, B, or C specifying split signal type.
<i>CardType</i>	If split: 2 designating S-Video or 3 designating Composite. (Note that these are the only valid designations into which a signal may be split.)

Note that the { }* syntax in the response describes one or more occurrences of the data enclosed within the curly brackets. This captures multiple inputs in the response if an "A" for All was specified in the request. Each successive output will appear on a separate line.

Example:

To get the status of RGB matrix unsplit input 22 the user would send the following request:

```
STA I 22<cr>
```

The matrix would then respond with:

```
STA 1 22(80,C,-5,N)<cr>
```

This means input 22 has a cable length of 80, configured to Consumer audio, an audio trim value of -5 dB and isn't split.

Example Split RGB:

To get the status of a split input 12 on a RGB matrix the user would send the following request:

```
STA I 12<cr>
```

The matrix would then respond with:

```
STA 1 12 (70,C,-5,Y,A:3,B:2)<cr>
```

This response tells the user that the input is split, cable length is 70, configured to Consumer audio, audio trim value of -5 dB, and that red is defined as a composite, and that green & blue are S-Video.

Example Output not split RGB

To get the status of non-split output 22 on a RGB matrix the user would send the following message:

```
STA O 22<cr>
```

The matrix will respond with the following

```
STA 1 22 (D,U, 60,1,-30,2,N,2)<cr>
```

This response means that the matrix type is RGB, output 22 is delay disabled, unmuted, output cable length of 60', sync equalization is On, audio level is -30dB, audio connected to input 2, not split, and video from input 2 is connected.

Example Output Split RGB

To get the status of split output 12 on a RGB matrix the user would request the following:

```
STA O 12<cr>
```

The matrix will then respond with the following:

```
STA 1 12 (E,M,60,2,-10,12,Y,A:3,14, B:2,10)<cr>
```

Output 12 is on a RGB matrix, delay is enabled, audio is muted, output cable length of 60', sync equalization is Auto, audio level is -10 dB, connected audio input 12, Split A is Composite and connected to input 14A, B&C are S-Video and connected to input 10B&C.

29 Set Time and Date Request

The time and date will be required for scheduled tasks on the matrix. The format to set time and date is as follows:

STD	time	date	<cr>
------------	------	------	------

Syntax: STD <<time> <date>>|<"?"> <cr>

Where:

STD Set time and date request header

time Time in format *hh:mm*a|p

Where:

hh=hour(1-12)

":" colon

mm=minute (00-59)

a|p "a" for am, "p" for pm

date Date in *mm/dd/yy* format

"?" Inquires the current time and date and returns the same in format above.

Example:

To set the time and date to noon, June 2, 2006 the user would send the following message:

`STD 12:00p 06/02/06<cr>`

To inquire the current time and data:

`STD ?<cr>`

The unit will respond with:

`STD 12:00p 06/02/06`

30 Output Sync Equ Request

The output sync equ request is only available on RGB units and sets the Sync equ to ON, OFF, or AUTO. The format of the output sync equ request is as follows:

SYN	status	outputSequence	<cr>
------------	--------	----------------	------

Syntax: SYN <status> <outputSequence><cr>

Where:

SYN Output Sync Equ request header
status "0" for OFF, "1" for ON and "2" for AUTO.
outputSequence Output as a *number sequence*.

Example:

`SYN 2 1,3<cr>`

Sets outputs 1 and 3 to AUTO.

31 Version Request

The user may request the firmware version numbers. These version numbers will be for the matrix test/loader, matrix application, front panel test/loader, and front panel application. The format for the request will be as follows:

VER	<cr>
------------	-------------------

Syntax: VER<cr>

Where:

VER Version Request header.

Response: VER Matrix Test/Loader = <XX.xx>, Matrix App = <XX.xx>, FP Test/Loader = <XX.xx>, FP App = <XX.xx>

Where:

XX.xx XX = Major version number, xx = Minor version number.

Example:

VER<cr>

To which the Matrix will respond:

VER Matrix Test/Loader = xx.xx, Matrix App = xx.xx, FP Test/Loader = xx.xx, FP App = xx.xx<cr>

32 Volume Request

The Volume request is used to adjust input trims or output level. It can also be used to inquire about the current value of an input trim or output level. The trims and levels can be set as a value, or adjusted up or down with “+” or “-“. Multiple consecutive “+” or “-“ characters may be entered, with each representing a 1 dB increment or decrement respectively.

VOL	“L” “T”	number	val “?”	<cr>
------------	---------	--------	---------	------

Syntax: VOL <“L”|“T”> < number > <value|“?”><cr>

Where:

VOL	Volume request Header
“L” “T”	output Level or Trim
number	The output number if L specified or the input number if T specified.
value	Volume value -10 to +10 for trims, -45 to +5 for level (in 1 dB increments) or “+” to increment volume in 1 dB increments, or “-“ to decrement volume in 1 dB decrements.
“?”	inquiry for the specified level or trim

Example:

`VOL L 4 -5<cr>`

Instructs the matrix to set output 4 audio level to -5dB.

`VOL L 4 +++<cr>`

Instructs the matrix to increase output 4 audio level +3dB.

33 Verbose Request

The user can, during debugging, turn on verbose mode to expand the standard error message describing the syntax to include a description of the command parameters.

VRB	"Y" "N"	<cr>
------------	----------------	-------------------

Syntax: VRB <"Y"|"N"><cr>

Where:

VRB Verbose request header

"Y"|"N" Y turns verbose on, N turns verbose off.

Example:

If the user tries to connect and invalid input or output, the standard error message would look something like this:

ERR: CON {<input>[card specifier] <"(numberSequence)">}*<cr>

If the user enabled verbose mode then the response would be as follows:

ERR: CON {<input>[card specifier] <"(numberSequence)">}*<cr>

Connect the specified input to specified output.

input Input number in the range 1 – max inputs

card specifier optional indicator of the card type with "A", "B" or "C" (applicable to split mode) designating video, "D" and "E" designating Horizontal and Vertical sync respectively and "F" designating audio.

numberSequence Outputs as number sequence in range 1 - max outputs.

