Chameleon256 Series Routing Switcher

Operation and Technical Manual

Chameleon256 Series Routing Switcher

Operation and Technical Manual

December, 2003

Warnings, Cautions and Others

Mises en garde, precautions et indications diverses

⚡ | **CAUTION**
RISK OF ELECTRIC SHOCK
DO NOT OPEN | ⚠

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK)
NO USER SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

⚡ The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

⚠ 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.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION
To reduce the risk of electrical shocks, fire, etc.:
1. Do not remove screws, covers or cabinet.
2. Do not expose this appliance to rain or moisture.

ATTENTION
Afin d'éviter tout risque d'électrocution, d'incendie, etc.:
1. Ne pas enlever es vis ni es panneaux et ne pas ouvrir le coff ret de l'appareil.
2. Ne pas exposer l'appareil a la pluie ni a l'humidité.

Caution — STANDBY/ON switch!
  Disconnect the mains plug to shut the power off completely. The STANDBY/ON switch in any position does not disconnect the mains line. The power cannot be remote controlled.

Attention — Commutateur STANDBY/ON!
  Déconnecter la fiche de secteur pour couper complètement le courant. Le commutateur STANDBY/ON ne coupe jamais complètement la ligne de secteur, quelle que soit sa position. Le courant ne peut être télécommandé.

NOTES

Limited Warranty

Unless otherwise stated in the product specific documentation received with this product, Knox Video Technologies provides a five-year limited warranty for this product. The above warranty period shall begin on the date of shipment by Knox to purchaser or, if purchaser is an authorized reseller of such Knox products, from the date of shipment by the reseller to the reseller's original customer.

The warranty set forth above shall not apply to failure or deficiency which has been caused by misuse, abnormal or unusually heavy use, neglect, alteration, improper installation, unauthorized repair or modification, improper testing, accidental or causes external to the product such as but not limited to excessive heat or humidity, power failure, or improper installation.

IF SERVICE IS REQUIRED:

If the product does not perform as warranted, call Knox Video Technologies at 301-840-5805 for available service options.

If it is necessary to return an item to Knox, the defective product should be securely packaged in original boxes and insured for shipment. Owner agrees to insure and accept all liability for loss of or damage to this product.

YOU MUST CALL TECHNICAL SUPPORT AT 301-840-5805 FOR A RETURN AUTHORIZATION NUMBER (RA) AND "SHIP-TO" ADDRESS BEFORE SHIPPING ANY PRODUCT TO KNOX.

This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

Knox Video Technologies
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KNOX VIDEO
Chameleon256 Routing Switcher

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Jumper position 2 is used to identify a board as being a BALANCED AUDIO board. This is necessary for Balanced Audio boards because the maximum number of inputs on balanced audio main board is 64; inputs from 64 to 128 require an AUX board.

Jumper positions 3 through 7 are used to modify the card's apparent position in the chassis to allow simultaneous switching of multiple cards, as with stereo audio or component video. With these jumper positions OFF each board has an address from 0 to 15; adding the jumpers modifies the card address as follows:

Position 3:	ON=subtract 2 from the real address
Position 4:	ON=subtract 4 from the real address
Position 5:	ON=subtract 8 from the real address

For example, to have a card in the 9th slot (outputs 65-96) switch as though it is in the first slot (outputs 1-32), add jumper 5. To have a card in the 15th slot switch as though it is in the 9th slot, add jumpers 3 and 4.

SECTION 1. GENERAL INFORMATION

1.1 INTRODUCTION

The Knox Chameleon256 Routing Switchers are high-bandwidth or medium-bandwidth modular audio/video routing switchers with a capacity of up to 256 inputs and 256 outputs.

1.2 TECHNICAL DESCRIPTION

The Chameleon256 Switchers are housed in a 12U rackframe. They have an optional **front panel** keypad controller **[on the front panel]**, and three DB9 female connectors on the rear panel, two for RS232 inputs from **external** Knox controllers or other RS232 terminal devices and one for daisy-chaining to other Knox Chameleon chassis.

1.3 DETAIL SPECIFICATIONS

Video

Frequency response-**HB**:	DC to 200MHz,
	300mV: <-3dB@150MHz
	1.0V: <-3dB@115MHz
Frequency response-**MB**:	DC to 30MHz,
	1.0V: +/- 0.5dB to 20MHz
	1.0V: <-3dB@30MHz
Input impedance:	75 ohm
Output impedance:	75 ohm
Crosstalk:	all hostile:
	typ <-60dB@5MHz
	typ <-50dB@20MHz
	typ <-25dB@100MHz
	one hostile:
	<-40dB@200MHz
Connectors:	BNC

Audio Channels, Balanced

Frequency Response:	DC to 50kHz, +/- 0.25dB up to 25dBu level
THD+N:	less than 0.05 %, 20Hz to 20kHz, 0 to +25dBu level
IMD (SMPTE):	less than 0.03 %, 20Hz to 20kHz, 0 to +25dBu
Noise:	less than -85dB, 20Hz to 20kHz
CMRR:	greater than 60dB at 60Hz, 50dB to 20kHz
Crosstalk:	less than -80dB, 20Hz to 20kHz, 2 adjacent channels driven
Input to Output Gain:	Unity +/- 0.25dB, into high Z, -1.3dB into 600 Ohms
Input Impedance:	20 kOhms, balanced
Output Impedance:	100 Ohms, balanced
Connectors:	Phoenix screwtype, removable

Audio Channels, Unbalanced

Frequency response:	20Hz to 30KHz
Level:	up to 2V, peak to peak
Input Impedance:	100K
Output impedance:	1K
Crosstalk:	<-85dB @1KHz
Connectors:	RCA

Controls

Controller:	(optional) 20-key front panel keypad
RS232 connectors:	3)DB9P (female) from terminal devices

Power 100-120 or 200-240 VAC, 47 to 63 Hz, 300 Watts maximum

Power connector: grounded AC power cord

Dimensions 12U rackmount housing, 19" wide x 10" deep x 21" high

Shipping weight 60 pounds

SECTION 4. MAINTENANCE

CAUTION! Disconnect from power before removing top cover. Do not operate unit with top cover removed.

4.1 INTRODUCTION

The Chameleon256 uses a combination of passive air flow (convection) and a low-velocity fan to keep its dual front panel-mounted power supplies within a comfortable operating temperature range. It is important to check for and correct against an accumulation of dust at least annually, or more often in a dusty environment.

The CPU card and the optional front panel controller both have battery backed-up memory for their crosspoint pattern storage and other non-volatile functions. It is important to check the batteries annually and replace them when necessary. For each board, the battery is a DL1220 type (one-half inch in diameter, 1/10 inch thick) with a 3.2 volt rating. To avoid memory loss, replace the battery when the measured voltage falls below 2.8 volts. Be sure the replacement battery is installed with the + side visible.

No other routine maintenance is required in the Chameleon256.

4.2 SWITCH/JUMPER OPTIONS

Each crosspoint card has 8 jumper positions labeled J2-J3 for configuring the cards.

Jumper positions 1 (far left) and 8 (far right) are used to identify whether a card is a video or audio card:

Position 1:	ON=VIDEO	OFF=AUDIO
Position 8:	ON=AUDIO	OFF=VIDEO

SECTION 2. INSTALLATION

> *WARNING!* ⚠
>
> **Static Sensitive Connectors!** During the installation process and whenever changing cables to the Chameleon256 inputs and outputs, use extreme caution to avoid conducting static electricity to any inputs or outputs including video, audio, and RS232.
> **DC Offset Warning!** Connect standard video and audio inputs and outputs only. Do not connect input or output signals with a positive or negative dc offset.
> **Chassis Ground is Earth Ground.** Do not connect video or audio cables with induced or direct-connection potential on the shield.

2.1 INTRODUCTION

This section provides the information required for installation of the Chameleon256 Routing Switchers into their operating environment.

2.2 UNPACKING AND INSPECTION

Unpack the Chameleon256 Routing Switcher carefully and verify that the serial number matches the number quoted on the packing list. Before installing it into a system, check the outside of the unit carefully for signs of damage and check that none of the fasteners have come loose.

2.3 INSTALLATION

The Chameleon256 Routing Switcher is designed to be mounted in a standard rack; it is 21 inches, or 12 standard rack units, high. Choose a space in the rack which is convenient for all the cables and mount the unit using standard rack bolts. Connect the power plug to a grounded AC power outlet of the voltage and frequency specified on the identification tag. There is no power switch on the Chameleon256; it is designed to be ON at all times. (If it is desirable to have the Chameleon256 powered down regularly, connect the power plug to a switchable AC power strip.) The AC Power cord is the disconnect device for the Chameleon256.

2.4 VIDEO AND AUDIO CONNECTIONS

The Chameleon256 Routing Switchers can be configured as video routers or audio routers, or as hybrids with both video and audio.

Inputs:

The input connectors are in the center 2/3 of the rear panel.

For <u>standard, non-hybrid routers</u>, all the rear panel connectors will be BNC's for video, and RCA's or Phoenix screwtype for unbalanced or balanced audio, respectively. In these cases the input connectors are numbered consecutively from 1 to 256. Connect audio or video inputs as desired.

For <u>hybrid routers</u> the left rear (looking from the rear) connectors will all be BNCs, numbered from 1 to 128 and the right rear connectors will all be RCAs or Phoenix connectors, numbered from 129 to 256. Connect audio and video inputs to the appropriate side as desired.

Outputs:

The output connectors are on the bottom and the top of the rear panel. For each main switcher card installed there will be 16 outputs labeled 1 to 16 on the bottom and 17 to 32 on the top.

For <u>standard, non-hybrid routers</u>, all the rear panel output connectors will be BNCs for video, and RCAs or Phoenix screwtype for unbalanced or balanced audio, respectively. Connect video or audio outputs as required.

For <u>hybrid routers</u> the left rear (looking from the rear) output connectors will all be BNCs and the right rear connectors will all be RCAs or Phoenix connectors. Connect audio and video outputs as required.

* * *

For balanced audio units, the Phoenix connectors may be removed while making the screw connections.

When installing balanced audio connections, use the center pin for the common or ground wire. The top or bottom pin may be used for either + or -, however, the connections <u>must</u> be consistent throughout.
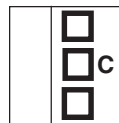
Phoenix connector
for Balanced
Audio

3.5 OPERATING FROM AN UPSTREAM DEVICE VIA THE CONTROLLER

Generally, commands from an upstream controller or terminal device can be passed through the Front Panel Keypad Controller or the Remote Keypad Controller to the router, and generally, all responses from the routing switcher to the controller will be echoed upstream to the terminal device.

However, all commands to the controller which are preceded by a $ are blocked. The store (S-key) functions listed below can be activated from a terminal by adding the $ in front of the command. The command arguments must be a part of the string from the terminal (e.g., $S8012 stores the current pattern into local pattern 12).

Command	Function	Argument
$S80	Store local pattern	01-20
$S81	Recall local pattern	01-20
$S82	Output number for single station mode	01-64
$S83	Set Mode	1=Full Function
		2=Single Station
		3=Strings
		4=Recall
$S90	Timed mode on	
$S91	Timed mode off	
$S92	Timed mode time	1-999
$S93	Select router	5=ChameleonHB/MB or 256
$S94	Clear patterns	No=0 Yes=1
$S95	Salvo Mode on/off	
$S96	Display current pattern	Enter to continue
$S97	Interrogates for cards	Chameleons only
$S98	Lock/unlock output	1-256
$S99	Queue mode on/off	

The typical terminal readout is:

KNOX ChameleonII COMMANDS, FOLLOWED BY <CR>:

Bxy/Bxxyy/Bxxxyyy	Both, xx=output yy=input
Vxy/Vxxyy/Vxxxyyy	Video, xx=output yy=input
Axy/Axxyy/Axxxyyy	Audio, xx=output yy=input
Exy/Exxyy/Exxxyyy	Both, delayed xx=output yy=input yy=audio in
Fxy/Fxxyy/Fxxxyyyzzz	Video, delayed xx=output yy=input
Gxy/Gxxyy/Gxxxyyy	Audio, delayed xx=output yy=input
Jxy/Jxxyy/Jxxxyyy	Both, conference xx=output yy=input
Kxy/Kxxyy/Kxxxyyy	Video, conference xx=output yy=input
Lxy/Lxxyy/Lxxxyyy	Audio, conference xx=output yy=input
Xxyz/Xxxyyzz/Xxxxyyyzzz	Both, salvo xx=1st output yy=last output zz=input
Yxyz/Yxxyyzz/Yxxxyyyzzz	Video, salvo xx=1st output yy=last output zz=input
Zxyz/Zxxyyzz/Zxxxyyyzzz	Audio, salvo xx=1st output yy=last output zz=input
Dxy/Dxxyy/Dxxxyyy	Dump configuration output xx to yy
Qxyz/Qxxyyzz/Qxxxyyyzzz*	Both, xx=output yy=video in zz=audio in
M	Dump all configuration
W	List card in chassis
Sn/Snn/Snnn	Store existing config into map nn (1 - 10)
Rn/Rnn/Rnnn	Restore map nn into existing config
Ts/Tss/Tsss	Timed sequence, from map 1 every ss sec
N	Stop timed sequence
I	Send signon message
C	Clears arrays
Ups	Set port (p=1-4) speed (1=1.2 2=2.4 3=9.6 4=19.2)
H	Help

*models without Conference Mode use J for mixed inputs

2.5 RS232 CONNECTIONS

The Chameleon256 Routing Switcher can be controlled by its optional front panel keypad controller, by Knox remote controllers, or by external RS232 devices via the three 9-pin connectors on the rear panel. To use an external driver connect a source of RS232 serial data to one or more of the three DB9 connectors marked P1, P2, and P3. The Chameleon256 Routing Switchers are wired as data terminals; that is, data out of the Chameleon256 is on pin 2, data in is on pin 3, and pin 5 is ground (common).

A direct connection (pin-to-pin) from a PC-compatible serial port normally works well; select 9600 baud, 8 bits, no parity, one or two stop bits, and no flow control, for best compatibility.

When a second chassis (usually audio) is to be linked to the first (usually video) it is customary to connect the controller to one of the top two RS232 input connectors (P1 or P2) on the first chassis, wired normally. Then connect a cable from the bottom input connector (P3) on the first chassis to one of the top two input connectors on the second chassis wired as follows: first chassis pin 2 to second chassis pin 3, pin 5 on the first to pin 5 on the second. A third chassis should be connected to the bottom connector (P3) of the second chassis.

2.6 INITIALIZING THE FRONT PANEL CONTROLLER

On power-up, the front-panel LCD display will indicate which Knox routing switcher the Keypad Controller has been set up to operate. The Chameleon256 uses the Cham256 setting. If the controller is not set for the Chameleon256, push the STORE key, then 93. The display will prompt you for the type of routing switcher you are controlling. Enter 5 for the Chameleon256, then push ENTER (use 1 for the RS4x4, 2 for the RS8x8, 3 for the RS16x16, or 4 for the Chameleon64).

If the front panel controller is being used for the first time, or in the event of a complete memory loss, there will be nonsense characters in the current crosspoint pattern map. To reinitialize these patterns, push the STORE key, then 94. Enter 1 then push the ENTER key to reinitialize, or push 0 and ENTER to quit.

> **CAUTION -- reinitializing erases all of your stored patterns!**

2.7 INITIALIZING THE CPU MEMORY

If the battery in the CPU has been changed there will be nonsense characters in the twenty stored patterns and in certain other memory areas. To clear the memory, send the command C, followed by ENTER to one of the serial ports.

2.8 SETTING A DIFFERENT BAUD RATE

All the communication ports on the Chameleon256 are set at the factory for 9600 baud, no parity, 1 or 2 stop bits. To change a baud rate, send the command U followed by a two-digit number followed by an ENTER. The first digit in the string is the port, 1 to 4, and the second is the speed:

1	1200 baud
2	2400 baud
3	9600 baud
4	19.2Kbaud

CAUTION! -- Setting a different baud rate for one of the ports can cause a communications failure in the event another operator is unaware of the change. Use this command with caution.

3.4.11 HOW TO USE THE TIMED PATTERN RECALL MODE

The controller can be programmed to recall the twenty crosspoint patterns stored in the router one at a time, at timed intervals. To turn the timed mode on, send a T followed by a one-, two-, or three-digit number corresponding to the number of seconds between patterns, followed by an ENTER.

To stop the timed mode, send an N followed by an ENTER.

Examples: T2[ENTER], T20[ENTER], T999[ENTER]

3.4.12 ANSWERBACK

A correctly formed and executed command will elicit the answerback, DONE. An incorrectly formed or un-executable command will elicit the answerback, ER-ROR.

3.4.13 INTERROGATING

To initiate the signon message (which contains information about the revision level of the software), send an I followed by an ENTER.

I[ENTER]

To interrogate the Chameleon as to the active cards, send the command W followed by an ENTER. Each audio and video card present will respond in turn.

3.4.14 HELP COMMAND

The Chameleon256 CPU responds to the command:

H[ENTER]

by listing the strings available in the command protocol. See Typical Terminal Readout on following page . . .

NOTE: For conference mode to work correctly, the cameras, monitors, microphones, and speakers for a given station must be wired to the same input/output number on the routing switcher. For example, a given station would have its camera on Video Input 6, its microphone on Audio Input 6, its Monitor on Video Output 6, and its speaker on Audio Output 6.

3.4.8 HOW TO STORE A CROSSPOINT PATTERN

To store the current pattern into the router's pattern memory, send an S, then a two-digit number from 01 to 20, then an ENTER. The current pattern will then be stored in the memory position you specified. Note: the pattern previously stored at that location will be overwritten.

Examples: S01[ENTER], S20[ENTER]

3.4.9 HOW TO RECALL A STORED PATTERN

To recall one of the stored patterns from the router's memory, send an R, then a two-digit number from 01 to 20, then an ENTER. The entire pattern will be updated all at once.

Examples: R01 [ENTER], R20 [ENTER]

3.4.10 HOW TO INTERROGATE A CROSSPOINT CONDITION

To determine the condition of a particular crosspoint or crosspoints, send a D, then a two-, four-, or six-digit number indicating the first and last crosspoint to be displayed, then push ENTER.

Sending just an M followed by an ENTER will display the entire crosspoint map.

Sending D0 will display the entire crosspoint map in a condensed mode.

Examples: D48[ENTER], D0820[ENTER], D001128[ENTER], M[ENTER]

SECTION 3. OPERATION

3.1 INTRODUCTION

This section explains in detail the operation of the Chameleon256 using either the front panel pushbutton switches or the RS232 port.

3.2 CONNECTIONS AND SETUP

Connect the video, audio, and data to the Chameleon256 Routing Switchers as described in Section 2, Installation. There is no requirement that all inputs be used or terminated.

If outputs are left over, they may be used like a distribution amplifier to buffer and distribute an input signal. To use extra outputs in this way, simply route the input you wish to distribute to as many available outputs as desired.

Outputs should not be looped back to the inputs driving them. If an output is then routed to its input, an illegal condition will exist and the output will oscillate at frequencies which could spill over onto other crosspoints.

3.3   OPERATING FROM THE FRONT PANEL CONTROLLER

3.3.1 SELECTING THE MODE

The Keypad Controllers can operate in one of four modes: (1)Full Matrix, (2)Single Output, (3)Strings, and (4)Recall. To select the mode push the Mode switch (in the Keypad16, push the S key, then 83, then ENter) then a number from 1 to 4. The current mode will be indicated in the scrolling display.

Mode 1: Full Matrix -- in this mode all the functions of the router switcher may be controlled by the remote; any input may be routed to any output, and the pattern storage, recall, and timed operation can be invoked.

Mode 2: Single Output -- in this mode the controller has been assigned to control a single output; pattern storage, recall, and timed operation cannot be invoked in this mode.

Mode 3: Strings -- in this mode the controller sends one of up to 64 preprogrammed strings of ASCII characters to the router. Normally these would be a series of commands to put some of the router outputs in a predetermined position. Strings can be entered from the keypad or from an upstream terminal.

Mode 4: Recall -- in this mode the controller can only be used to recall the stored patterns.

3.3.2 FULL MATRIX MODE

How to Route Audio and Video in One Command:

To route audio and video from the same input, push the BOTH key on the front panel controller, then a one-, two-, or three-digit number for the output you wish to route to, then a one-, two-, or three-digit number for the input you wish to route both audio and video from, then push the ENTER key. (The number of digits *must be the same* for inputs and outputs.)

To route nothing to an output, just enter a 0, 00, or 000 for the input number (the number of zeros must correspond to the number of output digits).

After the first BOTH command has been executed, it is not necessary to push BOTH before the output and input numbers on subsequent commands.

Examples: BOTH18[ENTER], BOTH0164[ENTER], BOTH127016[ENTER]

How to Route Video Alone:

To route video alone, push the VIDEO key, then a one-, two-, or three-digit number for the output you wish to route to, then a one-, two-, or three-digit number for the input you wish to route from, then push ENTER.

After the first VIDEO command has been executed, it is not necessary to push VIDEO before the output and input numbers on subsequent commands.

Examples: VIDEO18[ENTER], VIDEO0164[ENTER], VIDEO127216[ENTER]

3.4.5 HOW TO SEND A SALVO COMMAND

Sometimes you want to send the same input to a range of consecutive outputs; this is called a salvo. To send a salvo command, send an X, Y, or Z (X for BOTH, Y for VIDEO, or Z for AUDIO), and one to three digits for the first output in the range, then one to three digits for the last output in the range, then one to three digits for the input number to route from (the number of digits in each output and input must match), and ENTER. All the outputs in the range will then be connected to the input named.

Examples: X161[ENTER],
            Y183202[ENTER],
            Z005127001[ENTER]

3.4.6 HOW TO USE THE QUEUE COMMAND

Sometimes it is important to have a number of switches made all at the same instant. It is possible to queue a number of pattern changes ahead of time, then to have them all executed at once. Send the crosspoints as usual, but substitute an E, F, or G in place of the B, V, or A, respectively. The new crosspoints will be stored and ready to be executed. To execute the commands all at once, send a final command in the regular form using B, V, or A, or just send the command,

EE[ENTER]

All the commands will be executed at once.

Examples: E11[ENTER]E0216[ENTER]EE[ENTER]
            F18[ENTER]G32[ENTER]B22[ENTER]
            E005127[ENTER]E61[ENTER]E007128[ENTER]EE[ENTER

3.4.7 HOW TO SEND A CONFERENCE MODE COMMAND

Under certain circumstances, as in videoconferencing, you always want to cross-connect an input and an output such that person at station A sees and hears the person at station B and vice-versa. To cross-connect an input and an output in a single command send a J, K, or L (for BOTH, VIDEO, or AUDIO), then a one-, two-, or three-digit number for the first party, then a one-, two-, or three-digit number for the second party, then ENTER.

Examples: J01214[ENTER], K23[ENTER], L001128[ENTER]

3.4.3 ROUTING VIDEO AND AUDIO TOGETHER

To route both audio and video from the same input, send a four, six, or eight-byte command in the form:

Bxy[ENTER],
Bxxyy[ENTER],
Bxxxyyy[ENTER]

where xxx is an output number (01 to 64) and yyy is an input number (01-64). The number of digits in the input number must match the number of digits in the output number.

Examples: B16[ENTER], B1802[ENTER], B005127[ENTER]

To route both audio and video from different inputs, send a five, eight, or eleven-byte command in the form:

Qxyz[ENTER],
Qxxyyzz[ENTER],
Qxxxyyyzzz[ENTER]

where xxx is an output number (1 to 128), yyy is a video input number (1-256), and zzz is an audio input number (1 to 256). The number of digits in the input number must match the number of digits in the output number.

Examples: Q161[ENTER], Q183202[ENTER], Q005127001[ENTER]

3.4.4 TURNING AN OUTPUT OFF

Sometimes it is helpful to be able to disconnect a crosspoint altogether; that is, have nothing connected to an output. To turn an output off, send a letter (B for both, A for audio, or V for video), then the output number, then 0, 00, or 000 (to match the number of digits in the output number) then ENTER. To turn the output back on, route any input to it.

Examples: B10[ENTER], V1800[ENTER], A127000[ENTER]

How to Route Audio Alone:

To route audio alone, push the AUDIO key, then a one-, two-, or three-digit number for the output you wish to route to, then a one-, two-, or three-digit number for the input you wish to route from, then push ENTER.

After the first AUDIO command has been executed, it is not necessary to push the AUDIO before the output and input numbers on subsequent commands.

Examples: AUDIO18[ENTER], AUDIO0164[ENTER], AUDIO127216[ENTER]

How to Store a Crosspoint Pattern:

The Chameleon256's CPU card has the ability to store up to 64 complete crosspoint patterns in memory. As crosspoints are being made on the front panel controller, or from an external RS232 device, they are stored in the current crosspoint map. That map can be stored at any time in one of the twenty available locations. Push the STORE key, then a two-digit number from 01 to 64, then the ENTER key. Note: the pattern previously stored at that location will be overwritten.

Examples: STORE01[ENTER], STORE64[ENTER]

The Front Panel Controller can also store up to twenty patterns in its local memory. To store the current pattern in the controller's memory, push STORE, then 80, then a two-digit number from 01-20, then the ENTER key.To recall patterns from the controller's memory, push STORE, then 81, then a two-digit number from 01-20, then ENTER. Each controller has a battery-backed memory of its own patterns.

Examples: STORE80, 01, [ENTER]; STORE80, 20, [ENTER]

How to Recall a Stored Pattern:

To recall one of the 64 stored patterns from the Chameleon256's CPU memory, push the RECALL key, then a two-digit number from 01 to 64 for the pattern to be recalled, then the ENTER key.

Examples: RECALL01 [ENTER], RECALL64 [ENTER]

The Front Panel Controller can also store up to twenty patterns in its local memory. To recall patterns from the controller's memory push STORE, then 81, then a two-digit number from 01-20, then ENTER. Each controller has a battery-backed memory of its own patterns.

Examples: STORE81, 01, [ENTER]; STORE81, 20, [ENTER]

How to Turn a Crosspoint Off:

Sometimes it is helpful to be able to disconnect a crosspoint altogether; that is, have nothing connected to an output. To turn an output off, type a letter (BOTH, AUDIO, or VIDEO), then the output number, then 0, 00, or 000, then ENTER (the number of zeros must correspond to the number of output digits). To turn the output back on, route any input to it.

How to Send a Salvo Command:

Sometimes you want to send the same input to a range of consecutive outputs; this is called a salvo. To send a salvo command, push the SALVO mode button, then select BOTH, VIDEO, or AUDIO, and enter one to three digits for the first output in the range, then one to three digits for the last output in the range, then enter one to three digits for the input number to route from, and push ENTER (all inputs and outputs must have the same number of digits). All the outputs in the range will then be connected to the input named. (Note that the display will show an X for a BOTH, a Y for a VIDEO, and a Z for an AUDIO -- this denotes that the controller is in the Salvo mode.)

Examples: X181[ENTER],
              Y326406[ENTER],
              Z001128064[ENTER]

3.4.1 ROUTING VIDEO

To route video, send a four, six, or eight-byte command in the form:

Vxy[ENTER],
Vxxyy[ENTER],
Vxxxyyy[ENTER],

where xxx is an output number (001 to 128) and yyy is an input number (001-256).

Note: the number of digits in the input number must match the number of digits in the output number.

Examples: V16[ENTER], V1802[ENTER], V005127[ENTER]

3.4.2 ROUTING AUDIO

To route audio, send a four, six, or eight-byte command in the form:

Axy[ENTER],
Axxyy[ENTER],
Axxxyyy[ENTER],

where xxx is an output number (01 to 64) and yyy is an input number (01-64).

Note: the number of digits in the input number must match the number of digits in the output number.

Examples: A16[ENTER], A1802[ENTER], A005127[ENTER]

(table continued from previous page)

Command	Function	Argument
STORE95	Salvo Mode on/off	
STORE96	Display current pattern	Enter to continue
STORE97	Interrogates for cards	Chameleons only
STORE98	Lock/unlock output	1-256
STORE99	Queue mode on/off	
Mode	1=Full Function	
Mode	2=Single Station	
Mode	3=Strings	
Mode	4=Recall Patterns	

3.4 OPERATING FROM THE RS232 INPUT

A simple protocol allows all crosspoints to be set through the RS232 ports. There are three independent RS232 inputs connectors (P1, P2, and P3) on the rear of the Chameleon256 unit; each may be connected to an upstream terminal, computer, or other software-driven RS232 device. If multiple Chameleon256 chassis are to be interconnected, the RS232 input should go to P1 or P2; P3 will be used to daisy-chain the RS232 signal to P1 or P2 on the next chassis.

CAUTION! While each port is independent of the other, there is an aggregate maximum data transfer rate that can be accommodated by the Chameleon256's CPU. Use caution in driving more than one port with heavy traffic at the same time.

A fourth RS232 port is available on the CPU card inside the Chameleon256. It is reserved for use by the front panel controller, or for diagnostic use by service personnel.

Note: You may use upper or lower case letters in any command.

How to Use the Queue Command:

Sometimes it is important to have a number of switches made all at the same instant. It is possible using the keypad controller to queue a number of pattern changes ahead of time, then to have them all executed at once. Push the QUEUE button, then enter crosspoint changes as usual, selecting BOTH, VIDEO, or AUDIO, and entering the output and input numbers followed by the ENTER key. (Note that the display will show an E for a BOTH, an F for a VIDEO, and a G for an AUDIO -- this denotes that the controller is in the Queue mode.) Each change will be recorded at the routing switcher, but the changes will not take place until the QUEUE button is pushed a second time, or if a change is made at the router's front panel controls.

> Examples: E18[ENTER],
> F3208[ENTER],
> G128064[ENTER]

How to Interrogate a Crosspoint Condition:

To determine the condition of a particular crosspoint, enter the Display Mode by pushing the DISPLAY key. Then enter a one-, two-, or three-digit output number, and push ENTER. The LCD display will show all the crosspoints two at a time, beginning at that output number. Push the ENTER key to see more outputs; the display will return to READY after a few seconds if no more ENTERs are pushed. To repeat the last output queried, push the DISPLAY button followed by the ENTER button.

To display the entire map just push the DISPLAY key and push ENTER. Push key to advance through the crosspoints.

How to Use the Timed Pattern Recall Mode:

The controller can be programmed to recall the crosspoint patterns stored in the router at timed intervals. To turn the timed mode on, push the STORE key, then enter 90, then push ENTER. The display will read TIMED MODE ON. To turn timed mode off, push STORE, then 91, then ENTER. The display will read TIMED MODE OFF, then return to the READY prompt after a few seconds.

To set the time between patterns, push the STORE key, then enter 92. The display will prompt you for a time interval from 1 to 999; enter a one-, two-, or three-digit number and push ENTER. Each increment of time interval is about 1 second.

3.3.3 SINGLE OUTPUT MODE

Setting the Output Station:

In single-output mode, the output being controlled is listed on the scrolling display. To change the output push the STORE key, then 82, then enter a one- to three-digit output number, and push ENTER.

How to Route to the Selected Output:

Push the BOTH, VIDEO, or AUDIO key to choose Both, Video only, or Audio only, then enter a one-, two-, or three-digit number representing the input you wish to connect to. It is not necessary to push ENTER after a three-digit number. After BOTH, VIDEO, or AUDIO has been pushed, it is not necessary to push it again before subsequent commands.

To move between various inputs it is possible to use the SALVO and QUEUE buttons to move up or down through the inputs. Push the SALVO button to move to the next higher input (or QUEUE to move to the next lower) and push ENTER to execute the command.

3.3.4 STRINGS MODE

In strings mode only the pre-programmed strings can be sent from the controller; thus only the numeric buttons and the STORE button are used (the SALVO, QUEUE, BOTH, VIDEO, AUDIO, and RECALL buttons are not used). To send a string, enter the two-digit number from 01 to 64 for the string to be sent.

Simple strings may be entered from the keypad; more complex strings must be entered from an upstream terminal. From the keypad, in STRINGS mode, push the S key and a two-digit number between 01 and 64. Then enter the command exactly as you wish it to be sent (e.g., S01, then V1608), then push ENter. The carriage return after the command will be appended automatically.

In storing ASCII strings from an upstream terminal, the command $Sxx, where xx is a two-digit number from 01 to 64, must precede the actual string to be stored. Strings may contain any ASCII or HEX characters, but the HEX characters must be represented in brackets; e.g., <0D> for 0Dh (the carriage return function). No carriage return is appended, so each string must end with <0D> if a carriage return is desired. For example, if the terminal sends this sequence of characters:

$S01B0101<0D>B2208<0D>B0401<0D>

string 01 will contain a command to connect output 1 to input 1, output 22 to input 8, and output 4 to input 1 for both video and audio.

To replace a string simply store a new string over the old one.

3.3.5 RECALL MODE

In recall mode only patterns stored in the router's memory can be recalled (the SALVO, QUEUE, BOTH, VIDEO, AUDIO, STORE, and RECALL buttons are not used). To recall a pattern, enter the two-digit number of the pattern. It is not necessary to push ENTER.

3.3.6 SUMMARY OF STORE-KEY FUNCTIONS

Command	Function	Argument
STORE80	Store local pattern	01-20
STORE81	Recall local pattern	01-20
STORE82	Output number for single station mode	01-64
STORE83	Set Mode	1=Full Function
		2=Single Station
		3=Strings
		4=Recall
STORE84	--	
STORE85	--	
STORE86	--	
STORE87	--	
STORE88	--	
STORE89	--	
STORE90	Timed mode on	
STORE91	Timed mode off	
STORE92	Timed mode time	1-999
STORE93	Select router	5=ChameleonHB/ MB or 256
STORE94	Clear patterns	No=0 Yes=1

(table continues on next page)