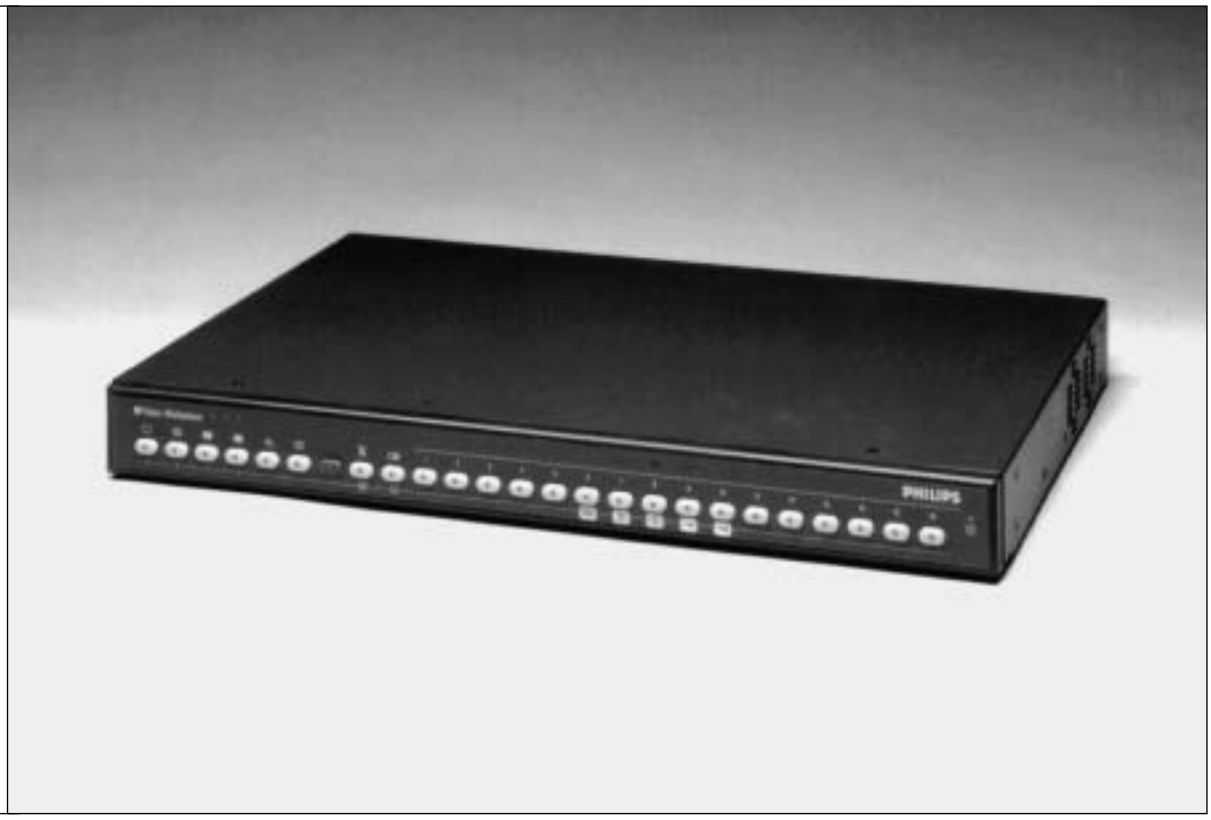
System4
Video Controllers
Command Console Language

User Manual



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Section 1: INTRODUCTION TO THE LTC 2600 SERIES COMMAND CONSOLE LANGUAGE 3
1.1 What is Command Console Language (CCL)? 3
1.2 CCL Communication Protocol 4
1.3 CCL Command Formats 5
1.4 CCL Command Function 6
Section 2: MULTIPLEXER SET (MS) COMMANDS 7
2.1 Summary of MS Commands 7
2.2 Detailed Descriptions of MS Commands 8
SECTION 3: MULTIPLAYER READ (MR) COMMANDS 26
3.1 Summary of MR Commands 26
3.2 Detailed Descriptions of MR Commands 27
SECTION 4: GENERAL COMMANDS 39
4.1 Summary of General Commands 39
4.2 Detailed Descriptions of General Commands 40
Appendix A: CCL TECHNICAL REFERENCE MATERIALS 45
Appendix B: DETAILED COMMAND REFERENCE MATERIALS 50

SECTION 1: INTRODUCTION TO THE LTC2600 SERIES COMMAND CONSOLE LANGUAGE

1.1 What is Command Console Language (CCL)?

The Command Console Language is used to control functions of the System4 multiplexer system through the use of its integral RS-232C port. A personal computer (dumb terminal) may be used to communicate with the System4 video controller. Various system functions may be controlled including: video switching, mode display, actions, alarms, and receiver/driver functions.

Once on-line, the CCL command prompt should appear from the connected system. If the prompt is not present, pressing ENTER (or sending carriage return character 0D hex) should bring the prompt up. The prompt will look as follows:

LTC26XX>

All commands should be entered only when this prompt is present unless otherwise specified. Typically, a single command per line is entered, but multiple commands may be entered if desired. Multiple commands on the same line must be separated using a semicolon (;) and can not exceed a maximum of 126 characters (including spaces). All command lines must be followed by a carriage return character (0D hex).

Command syntax is very important. CCL commands are very SPACE sensitive and should be entered exactly as indicated. All text commands contain a space between the text and the associated data values (unless indicated otherwise). A space is also inserted between multiple data values within a command (e.g. a list of camera numbers).

NOTE: This manual is intended for use by qualified programmers who are familiar with the use and terminology of the LTC2600 Series System4Video Multiplexers. This manual is organized so that information on individual commands can be located quickly and easily. Commands are organized by type in sections (see the Table of Contents), with each section providing a summary table and an alphabetical listing of commands. Definitions, syntax, and examples are provided for each command. ***Please refer to the Operator's Manual provided with the LTC2600 Series Multiplexer for complete details on the system functions relating to the CCL commands described in this manual.***

1.2 CCL COMMUNICATION PROTOCOL

Port Configuration

As the System4 multiplexer is shipped from the factory, the CONSOLE port communica-tion protocols are set according to the following figures. These settings can be changed by using the appropriate general command as listed in this manual (SET RS-232).

Baud Rate = 9600
Stop Bits = 1
Data Bits = 8
Parity = none

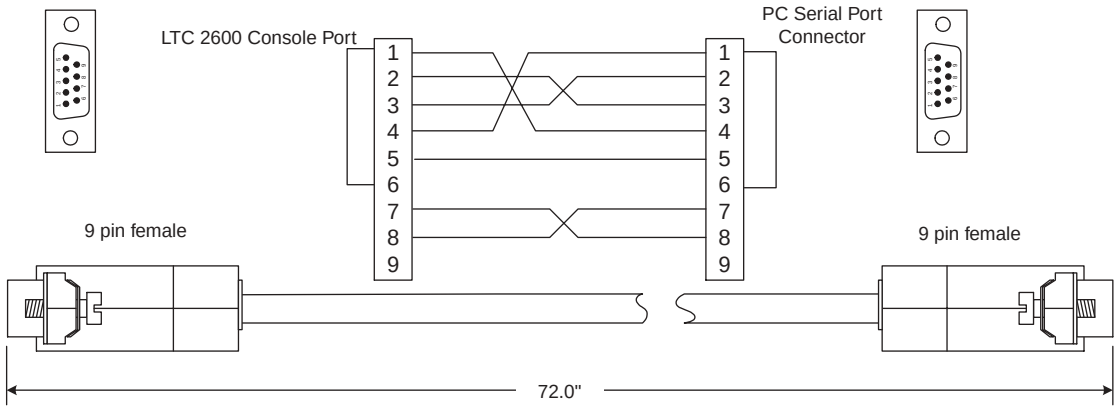
The 9-pin CONSOLE port is located on the rear panel of the multiplexer and has pinouts as indicated below. If the handshake feature is enabled but not desired, the signals can be defeated by placing a jumper across pins 4 and 5 of the CONSOLE port mating connector. If a jumper is added, remove any other cable connections on these two pins.

CONSOLE Port Pinouts

Pin #	Function
1	Chassis Ground
2	Receive
3	Transmit
4	CTS
5	RTS
6	No Connection
7	Data Ground
8	No Connection
9	No Connection

A CONSOLE port to standard 9-pin PC serial port cable is available by ordering Philips Part Number S1385.

CONSOLE Cable Pinouts



Conditions for Proper Command Execution

The LTC2600 multiplexer will accept and execute CCL commands only when the multiplexer is not involved in a system reset and the front panel keypad is not in use. Commands sent under these conditions will be ignored and will produce one of the following error messages:

ERROR: Console Command ignored; Multiplexer is resetting.

ERROR: Console Command ignored; Multiplexer local front panel keypad is in use, or timing out.

When the programming menu is being used by a system operator, the multiplexer will remain under the operator's control until the menu is exited.

CAUTION: There are two important exceptions to the rules of protocol as stated in this section: the RESET-SYSTEM and DEFAULT commands will be executed whenever received. Using the DEFAULT command will cause the loss of all previously entered user settings.

When a CCL command is received that contains an error in its format or parameter values, a descriptive message (as to the nature of the error) will be sent to the console. The execution of the CCL command will be aborted at the point of the error or illegal parameter value. Following are some sample error messages:

Illegal Command Message: **MS-ALARM-CAPTURE 1** (illegal capture time value)

Error Message: E**RROR: CAPTURE TIME** (must be 0 (off), or 3 to 60 seconds.)

1.3 CCL COMMAND FORMATS

The LTC2600 Series Command Console Language contains commands which control the operation of the multiplexer specifically (e.g. starting and stopping encoding, etc.), as well as commands that generally apply to the whole system's operation (e.g. setting system time and date information, etc.) Commands that apply only to the multiplexer operation use an M prefix, usually in combination with other prefixes which further specify the command function (see the following descriptions). Commands that are general in nature do not use a prefix.

Prefix	Description
M (Multiplexer)	Indicates the command is a multiplexer-specific command.
S (Select)	Indicates the command selects or sets a multiplexer system parameter.
R (Read)	Indicates the command is requesting that the multiplexer respond with the value of its setting. Note that dashes (-), if shown, must be used in the command line.

Prefix combinations used in the LTC2600 Series CCL include MS and MR (examples provided here for reference).

MS Command Examples

Multiplexer Set commands are used to set (or select) a specific multiplexer operating function.

MS-ACTION-CAPTURE (time)

This command sets the action capture time by allowing you to specify that parameter (from 3 to 60 seconds) where **(time)** is shown in the command syntax.

NOTE: Some MS commands require that a 16-position (bit) table be entered as the value of the parameter that is being set--e.g. **MS-ALARM-ENABLE (Table 16).** An example of how to complete this syntax is provided below.

MS-ALARM-ENABLE 65535 (If decimal entry mode is being used)

OR

MS-ALARM-ENABLE FFFF (If hexadecimal entry mode is being used)

Either of these commands enables Alarms 1 through 16 by specifying a value that represents a 16 position (bit) table having all bits set to 1 (1 Enables an Alarm, 0 Disables an Alarm). An illustration of how the table values are specified (binary equivalent), and additional examples, are shown in **Table 16.**

Alarm No.:	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Position (Bit) #:	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
All Alarms Enabled, Table Value 65535: (FFFF hex)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
All Alarms Disabled, Table Value 0: (0 hex)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alarms 1-4 Enabled, Table Value 15: (000F hex)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1

Table 16

MR Command Examples

Multiplexer Read commands are used to acquire the current settings of a multiplexer which has been set up through its local front panel keypad or by CCL commands. When an MR command is sent, the multiplexer responds in the following format with the requested data:

• The data is preceded by a space, colon, and a space on the same line as the command.

• Multiple items of data are separated by spaces.

• Text data is surrounded by double quotes.

• Numeric data is always returned as a decimal number, even if the HEX command has selected hexadecimal entry of numeric values.

• An ENTER (return) ends the data.

Note how the responses are shown in the following examples:

MR-ACTION-CAPTURE : 10
Returned time of 10 seconds.

MR-VCR-ENCODE-LIST : 1 2 10 11 12 16 5
Returned camera numbers in the VCR encode list.

MR-CAM-TITLE 1 : "LOBBY CAMERA"
Returned text of the title for camera 1.

General Command Examples

General commands are used to set or read parameters relating to general system functions. These commands do not use any prefixes in their syntax.

SET-RS-232 (baud) (data bits) (parity) (stop bits) (handshake)

With specific numeric values assigned for the parameters in parentheses, this command sets the RS-232 communication protocol.

DATE

Displays system date information.

1.4 CCL COMMAND FUNCTION

CCL commands correspond by function to the multiplexer menu selections used during keypad entry of the same settings. Some multiplexer menu selections do not have a corresponding CCL command, since the same capability is provided by another CCL command (e.g. there are no "Disable All Alarms" or "Enable All Alarms" CCL commands because the single **MS-ALARM-ENABLE** CCL command allows the operator to enable none, all, or any specific alarms.)

Similarly, when a front panel keypad entry of "Disable All Alarms" or "Enable All Alarms" is read back using an MR command, it will be reflected in the value of the returned **Table 16** value (e.g. "Disable All Alarms" is read back as a 0, "Enable All Alarms" is read back as 65535). Alarm Enable, Action Enable, and Video Color Enable all have front panel keypad entry "Disable All/Enable All" options, and will function likewise.

Numeric values in the command descriptions in the following sections in this manual assume the DECIMAL entry mode has been selected. Where hexadecimal values are also given, they are designated "(hex)".

Camera numbers referenced in the commands always refer to the numbers marked on the rear panel of the multiplexer. Camera numbers displayed on the monitor(s) can be offset from the rear panel numbers by using the **MS-CAM-NUMBER** command.

SECTION 2: MULTIPLEXER SET (MS) COMMANDS

2.1 SUMMARY OF MS COMMANDS

Command <parameters>
MS-ACTION-ALARM-RELAY <responds to> <polarity>
MS-ACTION-BEEPER <boolean>
MS-ACTION-CAPTURE <time>
MS-ACTION-CLEAR <camera map>
MS-ACTION-ENABLE <table 16>
MS-ACTION-HISTORY <camera map>
MS-ACTION-SENSITIVITY <camera#> <level>
MS-ACTION-SETUP <boolean> <boolean>
MS-ACTION-ZONEDRAW <zone draw setting>
MS-ACTION-ZONEGROUP <camera#> <table 8>
MS-ACTION-ZONES <camera#> <map row#> <zone map row>
MS-ACTIVE-CAMEO <monitor> <cameo#>
MS-ADDRESS <unit address>
MS-ALARM-BEEPER <boolean>
MS-ALARM-CAPTURE <time>
MS-ALARM-CLEAR <camera map>
MS-ALARM-ENABLE <table 16>
MS-ALARM-HISTORY <camera map>
MS-ALARM-POLARITY <table 16>
MS-ALARM-SETUP <boolean> <boolean>
MS-AUTOPRINT <boolean>
MS-AUTOSET <boolean> <boolean> <boolean> <boolean> <boolean>
MS-CAM-AUTOCOLOR <auto-detect>
MS-CAM-COLOR <table 16>
MS-CAM-FULL <monitor> <camera#>
MS-CAM-NUMBER <starting-number>
MS-CAM-TITLE <camera#> <"text">
MS-CAM-VIDEOLOSS-MESS <table 16>
MS-DISPLAY-MODE <monitor> <display-mode>
MS-FREEZE <monitor> <cameo#> <boolean>
MS-HELP
MS-KEY-LOCKOUT <boolean>
MS-LANGUAGE <language>
MS-LOG-SETUP <boolean> <boolean> <boolean> <boolean> <boolean>
MS-MON-A-DISPLAY <mode> <camera list>
MS-MON-BORDERS <brightness>
MS-MON-LARGE-TEXT <text-bright> <background-bright>
MS-MON-SMALL-TEXT <text-bright> <background-bright>
MS-MON-TEXT <brightness> <brightness>
MS-MON-TEXT-ENABLE <monitor> <boolean>
MS-MON-TIME-DATE-FORMAT <time-format> <date-format>
MS-MON-TIME-ENABLE <monitor> <boolean>
MS-MON-TIME-POSITION <location>
MS-OPERATION <operation>
MS-OPERATION-SIMPLEX <mode>
MS-OPERATION-DUPLEX <mode-D1> <mode-D2>
MS-PASSWORD <password> <password> <password>
MS-SEQ-DWELL <monitor> <mon-mode> <time>
MS-SEQ-DWELL-TIME <seq-device> <dwell-time>
MS-SEQ-ENABLE <monitor> <boolean>
MS-SEQ-LIST <monitor> <display-mode> <camera list>
MS-SEQ-MON-A <seq-mode> <camera list>
MS-SEQ-MON-B <camera list>
MS-SETUP-TITLE <setup#> <text>
MS-STATUS <camera map> <camera map> <camera map>
MS-SUMMER-TIME <date>
MS-SYSTEM-SETTINGS <action>
MS-TIME-EVENT <item> <begin-date> <begin-time> <end-date> <end-time> <function> <log> <interval> <SMTWTFS> <status>
MS-TIME-EVENT-COMMAND <command#> <"CCL command">
MS-TIME-EVENT-CONTROL <action>
MS-TIME-EVENT-STATUS <start-item> <end-item> <status>

MS-VCR-ACTION-RECORD <vcr> <record mode>
MS-VCR-ALARM-RECORD <vcr> <record mode>
MS-VCR-CUSTOM <custom-vcr-model#> <vcr-mode> <hour-rate> <field-rate-MSB>
<field-rate-LSB> <play-times>

MS-VCR-MODEL <vcr> <vcr-model#>
MS-VCR-PLAYBACK-ALGORITHM <algorithm>
MS-VCR-RECORD-ALGORITHM <algorithm>
MS-VCR-RECORD-LIST <vcr> <camera list>
MS-VCR-RELAY <vcr> <responds to> <polarity>
MS-VCR-TEST <boolean>
MS-VCR-TIME-LAPSE <vcr> <timelapse-mode> <vcr-mode>
MS-VCR-TITLE <custom-vcr-model#> <text>
MS-VCR-VEXT <vcr> <boolean>
MS-VIDEOLOSS-OUT <polarity>
MS-VIDEOLOSS-OUT-ENABLE <boolean>
MS-WINTER-TIME <date>
MS-ZOOM <monitor> <cameo#> <boolean>
MS-ZOOM-SCROLL <monitor> <direction>

2.2 DETAILED DESCRIPTIONS OF MS COMMANDS

MS-ACTION-ALARM-RELAY <responds to> <polarity>

NOTE: This command controls *Relay 1 only*.

This command allows you to set the action/alarm contacts to close on any action or alarm and change the multiplexer encoding speed to the action/alarm recording speed set by the **MS-VCR-TIME-LAPSE** command.

Parameter values for **<responds to>** and **<polarity>** are as follows:

<responds to>	0	Neither (never activates>
	1	Relay activates on action
	2	Relay activates on alarm
	3	Relay activates on action or alarm
<polarity>	0	Normally open (N/O)
	1	Normally closed (N/C)

CAUTION: Before making connections to the action/alarm relay contacts, refer to the LTC2600 Series Video Multiplexer Instruction Manual for relay contact ratings.

MS-ACTION-BEEPER <boolean>

This command enables or disables the beeper when an action condition is present.

Parameter values are:	0	Disabled
	1	Enabled

MS-ACTION-CAPTURE <time>

This command allows you to set a specified duration (from 3 to 60 seconds) for system indications of an action condition.

Parameter values for **<time>** are any value from <3> to <60> seconds.

NOTE: If a value less than <3> is entered (i.e. <0>…<2>), the value will automatically be set to 3 seconds.

MS-ACTION-CLEAR <camera map>

This command clears the action status of the multiplexer. For each bit which is 1 <camera map>, the action status will be cleared.

NOTE: The **<camera map>** consists of a 16-bit map with a bit for each camera in the multiplexer. The least significant bit corresponds to camera 1; the most significant bit corresponds to camera 16. A set bit corresponds to an enabled or active camera, depending on the contact.

MS-ACTION-ENABLE <table 16>

This command enables multiplexer action detectors corresponding to the values specified in a 16-position (bit) table. The value in each position of the table corresponds to the state of a specific action detector (a value of 1 enables the action detector; a value of 0 disables the action detector).

Parameter values for **<table 16>** range from **<0>** to **<65535> (decimal)** OR **<0>** to **<FFFF>** hex.

EXAMPLE: To enable ONLY Action Detectors 1-4, a value of 15 decimal (000F hex) is used for <table 16>.

Action Detect. No.:	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Position (Bit) #:	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1-4 Enabled, Table Value 15: (000F hex)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1

MS-ACTION-HISTORY <camera map>

This command clears the action status history for cameras in the camera map.

NOTE: The **<camera map>** consists of a 16-bit map with a bit for each camera in the multiplexer. The least significant bit corresponds to camera 1; the most significant bit corresponds to camera 16. A set bit corresponds to an enabled or active camera, depending on the contact.

MS-ACTION-SENSITIVITY <camera#> <level>

This command sets the action detector sensitivity for each specified camera to a certain level.

Parameter values for **<camera# >** and **<level >** are as follows:

<camera# >	1 to 16
<level>	1 to 4 (with 4 being the highest sensitivity)

MS-ACTION-SETUP <boolean> <boolean>

This command sets the action manual reset and camera history settings, respectively.

Parameter values are:	0	Disabled
	1	Enabled

MS-ACTION-ZONEDRAW <zone draw setting>

NOTE: This command is only supported for binary protocol.

This command enables or disables real-time zone drawing on monitor A.

Parameter values for **<zone draw setting>** are:

0	Disabled
camera#	Enabled; the specified camera is selected for monitor A in full-screen mode, and real-time drawing is enabled for that camera-overriding any other use of monitor A.

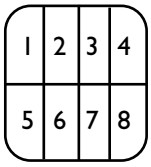
MS-ACTION-ZONEGROUP <camera#> <table 8>

This command enables more detailed, specialized setup of groups of action detector zones. (Individual action zone selection is normally accomplished using monitor A and the front panel keypad.)

Parameter values for **<camera# >** range from **<1>** to **<16>**. Parameter values for **<table 8>** range from **<0>** to **<255> (decimal)** OR **<0>** to **<FF> (hex).** Table 8 is an 8-position (bit) table where the value in each position corresponds to the state of a specific action detection zone group (i.e. <1> enables the zone group; <0> disables the zone group.)

EXAMPLE: To enable camera number 1, action detection zone groups 4, 7, and 8; a value of <1> is used for **<camera#>,** and a value of **<200>** decimal **(C8 hex)** is used for **<table 8>.**

Monitor Zone Groups



Zone Group No.:	8	7	6	5	4	3	2	1
Position (Bit) #	7	6	5	4	3	2	1	0
Zones 4, 7, and 8 Enabled, Table Value 200: (C8 hex)	1	1	0	0	1	0	0	0

Table 8

MS-ACTION-ZONES <camera#> <map row#> <zone map row>

This command sets the specified map row in the action zone map for the specified camera.

Parameter values for **<camera#>, <map row#>,** and **<zone map row>** are defined as follows:

<camera# > 1 to 16

<map row#> 1 to 16

<zone map row> A 16-bit word, corresponding to the map row points where the zone map bit 0 is the most right point, and the zone map bit 15 is the most left point.

MS-ACTIVE-CAMEO <monitor> <cameo#>

This command sets the specified cameo as the active cameo for the specified monitor. Any non-valid <cameo#> will be ignored.

Parameter values for <monitor> and <cameo#> are as follows:

<monitor> 1 Monitor A
2 Monitor B

<cameo#> 1 to 16

MS-ADDRESS <unit address>

This command sets the unit address for the multiplexer. The unit address is used by the external keyboard to select a particular multiplexer. Each multiplexer in the system must have a unique address, although this cannot be verified automatically by the multiplexer.

Parameter values for **<unit address>** range from <1> to <30>.

MS-ALARM-BEEPER <boolean>

This command enables or disables the beeper when an alarm condition is present.

Parameter values are: 0 Disabled
1 Enabled

MS-ALARM-CAPTURE <time>

This command allows you to set a specified duration (from 3 to 60 seconds) for system indications of an alarm condition.

Parameter values for **<time>** are any value from <3> to <60> seconds.

NOTE: A value of <0> for <time> sets latch mode. If a value of <1> or <2> is entered, the value will automatically be set to 3 seconds.

MS-ALARM-CLEAR <camera map>

This command clears the alarm status of the multiplexer. For each bit which is 1 <camera map>, the alarm status will be cleared.

NOTE: The **<camera map>** consists of a 16-bit map with a bit for each camera in the multiplexer. The least significant bit corresponds to camera 1; the most significant bit corresponds to camera 16. A set bit corresponds to an enabled or active camera, depending on the contact.

MS-ALARM-ENABLE <table 16>

This command enables multiplexer alarms corresponding to the values specified in a 16-position (bit) table. The value in each position of the table corresponds to the state of a specific alarm (a value of 1 enables the alarm; a value of 0 disables the alarm).

Parameter values for **<table 16>** range from **<0>** to **<65535> (decimal)** OR **<0>** to **<FFFF> hex.**

EXAMPLE: To enable ONLY alarms 1-4, a value of <15> decimal (000F hex) is used for <table 16>.

Alarm No.:	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Position (Bit) #:	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1-4 Enabled, Table Value 15: (000F hex)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1

MS-ALARM-HISTORY <camera map>

This command clears the alarm status history for cameras in the camera map.

NOTE: The **<camera map>** consists of a 16-bit map with a bit for each camera in the multiplexer. The least significant bit corresponds to camera 1; the most significant bit corresponds to camera 16. A set bit corresponds to an enabled or active camera, depending on the contact.

MS-ALARM-POLARITY <table 16>

This command allows you to select normally open and normally closed switches for alarms.

The <table 16> parameter ranges in value from <0> to <65535> (decimal) OR <0> to <FFFF> (hex). Table 16 is a 16-position (bit) table where the value in each position corresponds to the type of a specific alarm switch (0 selects normally open alarm switches; 1 selects normally closed alarm switches.

EXAMPLE: To select Normally Open (N/O) alarm switches for alarms 1-8 and Normally Closed (N/C) alarm switches for alarms 9-16, a value of <65280> decimal (FF00 hex) is used for <table 16>.

Alarm No.:	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Position (Bit) #:	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1-8 N/0, 9-16 N/C, Table Value 65280: (FF00 hex)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0

MS-ALARM-SETUP <boolean> <boolean>

This command sets the alarm manual reset and camera history settings, respectively.

Parameter values are:
0 Disabled
1 Enabled

MS-AUTOPRINT <boolean>

This command enables or disables automatic printing of the log. If enabled, the command will take effect when the serial port function is set to PRINT.

Parameter values are:
0 Disabled
1 Enabled

MS-AUTOSET <boolean> <boolean> <boolean> <boolean> <boolean

This command carries out the autoset function for the current setup for each of the following: record , video loss , sequence, alarm , and action list respectively.

Parameter values are: 0 Disabled

1 Enabled

MS-CAM-AUTOCOLOR <auto-detect>

This command enables or disables the multiplexer autocolor operation. When autocolor is enabled, the system automatically enables color operation for any color camera connected to the system (or added later). When autocolor is disabled, the multiplexer will use the results of the last autocolor detection to enable the color operation of the cameras (unless an MS-CAM-COLOR command is sent).

Parameter values for **<auto-detect>** are:

0 Disables Autocolor

1 Enables Autocolor

MS-CAM-COLOR <table 16>

This command allows the color operation of the cameras connected to the system to be manually selected.

NOTE: AUTOCOLOR is automatically disabled whenever and MS-CAM-COLOR command is sent.

The **<table 16>** parameter ranges in value from **<0>** to **<65535> (decimal)** OR **<0>** to **<FFFF> (hex).** Table 16 is a 16-position (bit) table where the value in each position corresponds to the color operation of a specific camera (i.e. a value of 1 enables color; a value of 0 disables color).

EXAMPLE: To enable color on **only** cameras 1-4, a value of <15> decimal (000F hex) is used in **<table 16>.**

Camera No.:	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Position (Bit) #:	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1-4 Enabled, Table Value 15: (000F hex)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1

MS-CAM-FULL <monitor> <camera#>

This command assigns the specified camera to the specified monitor if the monitor is in full screen mode.

NOTE: *If the monitor is not is full screen mode, the command has no effect.*

Parameter values for **<monitor>** and **<camera#>** are:

<monitor> 1 Monitor A
2 Monitor B

<camera#> 1 to 16

MS-CAM-NUMBER <starting-number>

This command sets the starting camera number to be displayed on the monitor when the camera connected to rear panel camera input #1 is selected.

Parameter values for **<starting-number>** range from <1> to <983>.

EXAMPLE: If you wanted to set 101 as the number to be displayed on the monitor(s) when the camera connected to rear panel camera input #1 is selected, you would enter <101> as the value for <starting-number>. The camera connected to rear panel camera input #2 would then automatically be displayed as camera 102, and so on.

MS-CAM-TITLE <camera#> <"text">

This command specifies a camera title to be displayed on the monitor screen.

Parameter values for **<camera#>** and **<"text">** are as follows:

<camera#> 1 to 16

<"text"> Valid characters are: A to Z (uppercase only), 0 to 9, space, * + , - . / : [ ] , 16 characters maximum (not including double quotes which must be used on either side of the text)

NOTE: Each camera's title is set individually. The camera title entered must begin and end with double quotation marks, as shown in the command syntax (these marks will not be shown on the screen). If lowercase characters are used, they will automatically be converted to uppercase. Any illegal characters will be replaced with a ":?".

MS-CAM-VIDEOLOSS-MESS <table 16>

This command enables or disables video loss messages.

The **<table 16>** parameter ranges in value from **<0>** to **<65535> (decimal)** OR **<0>** to **<FFFF> (hex).** Table 16 is a 16-position (bit) table where the value in each position corresponds to the video loss messages status of a specific camera (i.e. a value of 1 enables video loss messages; a value of 0 disables the video loss messages).

NOTE: Video loss messages can be disabled for connected or disconnected cameras. When a camera with videoloss message disabled is connected to the system, the videoloss message is not automatically enabled (i.e. the command must be given to enact a change in this function).

EXAMPLE: To disable video loss messages related to camera 1, a value of <65534> decimal (FFFE hex) is used for <table 16>.

Camera No.:	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Position (Bit) #:	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1-4 Enabled, Table Value 15: (000F hex)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1

MS-DISPLAY-MODE <monitor> <display-mode>

This command sets the display mode for the specified monitor.

Parameter values for **<monitor>** and **<display-mode>** are:

<monitor>	1	Monitor A
	2	Monitor B
<display-mode>	0	Full Screen
	1	Single Quad
	2	3 x 3 Multi
	3	4 + 3 Multi
	4	12 + 1 Multi
	5	4 x 4 Multi
	6	8 + 2 Multi

NOTE: Selecting Quad mode will loop between available quad modes. For non-duplex, System4 units, only Full Screen mode will be accepted for monitor B.

MS-FREEZE <monitor> <cameo#> <boolean>

This command enables or disables the freeze function for the specified cameo on the specified monitor.

NOTE: If the specified monitor is in full screen mode, the cameo specification is redundant (i.e. unnecessary).

Parameter values for **<monitor>, <cameo#>** and **<boolean>** are:

<monitor>	1	Monitor A
	2	Monitor B
<cameo#>	1	to 16
<boolean>	0	Disable
	1	Enable

MS-HELP

This command displays a screen of help instructions regarding MS command entry.

MS-KEY-LOCKOUT <boolean>

This command sets or clears the lockout flag for the front panel and external keypad. When set, all front panel and external keystrokes are ignored. PTZ commands continue to be accepted from the external keypad.

Parameter values are:	0	Disabled
	1	Enabled

MS-LANGUAGE <language>

This command specifies the language for the multiplexer.

Parameter values for **<language>** are:

1	English
2	German
3	French
4	Spanish
5	Italian
6	Dutch

MS-LOG-SETUP <boolean> <boolean> <boolean> <boolean> <boolean>

This command enables of disables logging of the following: action, alarms, videoloss, events, and errors (respectively).

Parameter values are:	0	Disabled
	1	Enabled

MS-MON-A-DISPLAY <mode> <camera list>

This command allows you to select the display mode for monitor A, as well as the cameras to be displayed in the specified mode.

Parameter values for **<mode>** and **<camera list>** are:

<mode>	0	Full Screen
	1	Single Quad
	2	3 x 3 Multi
	3	4 + 3 Multi
	4	12 + 1 Multi
	5	4 x 4 Multi
	6	8 + 2 Multi

NOTE: Selecting Quad mode will loop between available quad modes. For non-duplex, System4 units, only Full Screen mode will be accepted for monitor B.

<camera list> A list of camera numbers (values 1 to 16), up to 16 numbers (one for every cameo in the screen mode selected). The order depends on the screen mode selected (i.e. how cameos are arranged in the screen).

EXAMPLE:

3 x 3 Mode Display

5	6	7
1	2 3	
12	13	14

To view the above screen layout on monitor A, enter a value of <2> for the mode and a value of <5 6 7 1 2 3 12 13 14> for the camera list. The position of a camera in the camera list determines in which cameo the camera will be displayed. The number of items in the required camera list varies based on the display mode selected.

SCREEN MODES AND SCREEN SEGMENT NUMBERING:

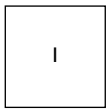
The numbers shown inside the cameos indicate the position of that cameo in the camera list

ADDITIONAL NOTES ABOUT THE MS-MON-A-DISPLAY COMMAND:

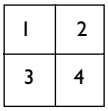
- The source of the video being viewed and the display mode available will be determined by the current operating mode (e.g. encode, decode, live) of the multiplexer.
- Whenever a camera is specified for a cameo, the zoom, freeze, and sequencing modes in that cameo are turned off.

- If no camera list is sent, the current camera list for the specified display mode will be used. This allows display mode selection while retaining the current camera selections and zoom/sequence settings (as applicable).
- If a camera list length is less than the number required to completely specify all the cameos, the current camera list for that display mode will be used for the unspecified cameras. This allows display mode selection and partial camera selection changes, while retaining some of the camera selections and sequence settings (as applicable).
- If a camera list length is more than the number required to completely specify all the cameos, the extra cameras settings are ignored, without an error message. This allows a previously selected prioritized camera list to be to the extent of the display mode selected.
- When the **MS-MON-A-DISPLAY** command is sent, the front panel keyboard will be allocated to MON A, and the MON B LED will go off (if the keyboard was previously allocated to MON B). Camera 1 will be selected as the active camera.
- Delay slightly when sending multiple **MS-MON-A-DISPLAY, MS-OPERATION-SIMPLEX, MS-OPERATION-DUPLEX** commands (about .1 sec) to avoid getting an error message stating that the multiplexer keyboard is busy (it may be busy processing one of the above commands previously sent).

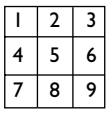
mode = 0
Full Screen Mode



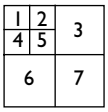
mode = 1
2 x 2 Mode



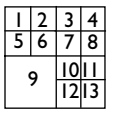
mode = 2
3 x 3 Mode



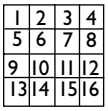
mode = 3
4 + 3 Mode



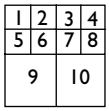
mode = 4
12 + 1 Mode



mode = 5
4 x 4 Mode



mode = 6
6 + 2 Mode



MS-MON-BORDERS <brightness>

This command specifies the border brightness for cameos shown on monitor A during multi-screen displays.

Parameter values for **<brightness>** are:

0	Transparent
1	Black
2-6	Grey*
7	White

*Note that all grey values (2-6) will set an identical grey value which will be returned as 2.

MS-MON-LARGE-TEXT <text-bright> <background-bright>

MS-MON-SMALL-TEXT <text-bright> <background-bright>

This command specifies the text brightness and background outline brightness (whether large or small) for

Parameter values for **<text-bright>** and **<background-bright>** are:

Transparent:	1
Black:	1
Grey:	2
White:	8

MS-MON-TEXT <brightness> <brightness>

This command sets the foreground and background brightness (respectively) for all text on all monitors.

Parameter values for **<brightness>** are:

0	Transparent
1	Black
1	Grey
2 7	White

MS-MON-TEXT-ENABLE <monitor> <boolean>

This command enables or disables text display for the specified monitor.

Parameter values for **<monitor>** and **<boolean>** are:

<monitor>	1	Monitor A
	2	Monitor B
<boolean>	0	Disables
	1	Enables

MS-MON-TIME-DATE-FORMAT <time-format> <date-format>

This command sets the formats for the time and date displayed on the monitor.

NOTE: The time and date formats can also be set using the DATE/TIME General commands.

Parameter values for **<time-format>** and **<date-format>** are:

<time-format>	12	12 hr. mode
	24	24 hr. mode
<date-format>	1	MM DD YY
	2	DD MM YY
	3	YY MM DD

MS-MON-TIME-ENABLE <monitor> <boolean>

This command enables or disables time/date display for the specified monitor.

Parameter values for **<monitor>** and **<boolean>** are:

<monitor>	1	Monitor A
	2	Monitor B
<boolean>	0	Disables
	1	Enables

MS-MON-TIME-POSITION <location>

This command sets the time/date display row position for any enabled monitors and for both small and large text. The specified row value is converted into one corresponding to bottom, middle, or top of the screen.

Parameter values for **<location>** are:

0	Time/date display OFF
1	Time/date display ON
2-31	(NTSC) Display row position
5-33	(PAL) Display row position

MS-OPERATION <operation>

This command sets the current system operation mode to the specified mode. The system will reject any value that is not compatible with the current configuration (i.e. simplex/ duplex, standard/System4).

Parameter values for **<operation>** are:

3	live
4	record
5	playback
6	playback-record (duplex and duplex/System4 only)
7	record-record (duplex/System4 only)
8	playback-playback (duplex/System4 only)

MS-OPERATION-SIMPLEX <mode>

This command sets the operating mode for simplex multiplexer models.

Parameter values for **<mode>** are:

1	Monitor A - live digital, record OFF
2	Monitor A - decoding, record OFF
3	Monitor A - live analog, record ON

NOTE: Delay slightly when sending multiple **MS-OPERATION-SIMPLEX** commands (about .1 sec.) to avoid getting an error message stating that the keyboard is busy (it may be busy processing an earlier command).

MS-OPERATION-DUPLEX <mode-D1> <mode-D2>

This command sets the operating mode for duplex multiplexer models.

Parameter values for **<mode-D1>** and **<mode-D2>** are:

<mode-D1>	1	Monitor A - live digital
	2	Monitor A - playback
	4	Record ON - System4 models only
<mode-D2>	0	Record OFF
	1	Record ON

NOTE: Delay slightly when sending multiple **MS-OPERATION-DUPLEX** commands (about .1 sec.) to avoid getting an error message stating that the keyboard is busy (it may be busy processing an earlier command).

For new applications, use the MS-OPERATION command instead of this one.

MS-PASSWORD <password> <password> <password>

This command changes the password in the multiplexer. The first parameter is the old password. The second and third parameters are the new password value (repeated). The command is rejected if the first parameter is not the same as the unit's current password, or if the second parameter is not the same as the third parameter.

Parameter values for **<password>** are **<digit><digit><digit><digit>** where **<digit>** equals any number between 0 and 9.

MS-SEQ-DWELL <monitor> <mon-mode> <dwell-time>

This command sets the sequence dwell time for the specified monitor in the specified display mode.

Parameter values for **<monitor>, <mon-mode>,** and **<dwell-time>** are:

<monitor>	1	Monitor A
	2	Monitor B
<mon-mode>	1	Full screen mode
	2	Quad mode
<dwell-time>	0	Sequence disabled
	1-60	Dwell time in seconds

MS-SEQ-DWELL-TIME <seq-device> <dwell-time>

This command sets the sequence dwell time for the specified monitor in the specified display mode (<seq-device>).

Parameter values for **<seq-device>** and **<dwell-time>** are:

<seq-device>	1	Monitor A - Full screen
	2	Monitor A - Quad
	3	Monitor B - Full screen
	4	Monitor B - Quad
<dwell-time>	0	Sequence disabled
	1-61	Dwell time in seconds

For new applications, use the MS-SEQ-DWELL command instead of this one.

MS-SEQ-ENABLE <monitor> <boolean>

This command enables or disables sequencing for the specified monitor if its display mode is Full or Quad.

Parameter values for **<monitor>** and **<boolean>** are:

<monitor>	1	Monitor A
	2	Monitor B
<boolean>	0	Disable sequencing
	1	Enable sequencing

MS-SEQ-LIST <monitor> <display-mode> <camera list>

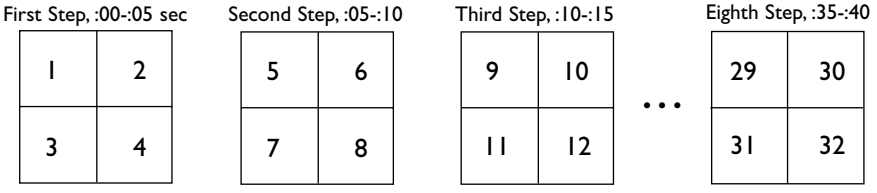
This command defines the sequence (i.e. camera-to-cameo assignment) for the specified display mode on the specified monitor.

Parameter values for **<monitor>, <display-mode>,** and **<camera list>** are:

<monitor>	1	Monitor A
	2	Monitor B
<display-mode>	0	Full screen
	1	Single quad
	2	3x3 multi
	3	4+3 multi
	4	12+1 multi
	5	4x4 multi
	6	8+2 multi
<camera list>		A list of camera numbers (1-32) given in the order desired for the sequence/display. (See the following example).

EXAMPLE: The diagram and sample command syntax illustrates the functioning of sequence lists for the quad mode.

LTC2600> MS-SEQ-LIST 1 1 1 2 3 4 5 6 7 8 9 10 11 12 … 29 30 31 32



MS-SEQ-MON-A <seq-mode> <camera list>

This command defines the sequencing mode (i.e. camera-to-cameo assignment) for monitor A.

Parameter values for **<seq-mode>** and **<camera list>** are:

<seq-mode>	1-4	These values do not correspond to the 4 cameos in quad mode; any value 1-4 will be interpeted as single quad mode.
	5	Full screen
		NOTE: Selecting quad mode will loop between available quad modes.
<camera list>		A list of camera numbers (1-16) given in the order desired for the sequence/display. Up to 32 camera numbers can be listed.

MS-SEQ-MON-B <camera list>

This command defines the camera sequence for monitor B.

NOTE: To work with quad mode, the commands **MS-SEQ-LIST** and **MS-DISPLAY-MODE** must be used.

Parameter values for **<camera list>** are camera numbers (1-16) given in the order desired for the sequence/display. The sequence list can have up to 32 camera.

MS-SETUP-TITLE <setup#> <text>

This command defines the title for a specified setup.

Parameter values for **<setup#>** and **<text>** are:

<setup#>	1-6	(Value corresponds to the desired setup.)
<text>		(Use acceptable alpha/numeric characters-see Appendix A; only the first 12 characters of <text> will be used.)

MS-STATUS <camera map> <camera map> <camera map>

This command is used to clear the videoloss, alarm, and action status conditions of the multiplexer (in that order, respectively).

The **<camera map>** parameter is a 16-bit map with a bit for each camera in the multiplexer. The least significant bit corresponds to camera 1; the most significant bit corresponds to camera 16. A set bit corresponds to an enabled or active camera, depending on the context.

Parameter 1 is a map of cameras which will have videoloss status cleared.
Parameter 2 is a map of cameras which will have alarm status cleared.
Parameter 3 is a map of cameras which will have action status cleared.

For each bit which is set in parameter 1, 2, or 3, the videoloss, alarm, and action status (respectively) will be cleared.

MS-SUMMER-TIME <date>

This command sets the date when the time-of-day clock will be put forward by one hour (Daylight Saving Time). At 2:00 a.m. / 02:00 on the date set, the hour is advanced to 3:00 a.m. / 03:00.

MS-SYSTEM-SETTINGS <action>

This command saves or restores system settings. There are six memory locations available to save to and restore from. Each memory location will save a complete system configuration. Note that system settings do not include time-event related settings.

CAUTION: When "Save settings to…" is selected as the <action> parameter, the previously saved settings will be lost and replaced by the new system settings. When "Restore settings to…" is selected as the <action> parameter, all current system settings will be lost and replaced by the last set of settings that were in the memory specified by the "Restore settings…" command.

If the settings were never saved or if the **DEFAULT** command is used, the "Save" memory locations will contain the default system settings.

(continued)

Parameter values for <action> are as follows:

10	Save settings to Save Memory 1
11	Save settings to Save Memory 2
12	Save settings to Save Memory 3
13	Save settings to Save Memory 4
14	Save settings to Save Memory 5
15	Save settings to Save Memory 6
20	Restore settings from Save Memory 1
21	Restore settings from Save Memory 2
22	Restore settings from Save Memory 3
23	Restore settings from Save Memory 4
24	Restore settings from Save Memory 5
25	Restore settings from Save Memory 6`

EXAMPLE: To save the current system configuration (results of CCL commands and front panel keypad menu entries), a value of 10 is used for <action> (saves the settings into memory #1).

MS-TIME-EVENT <item> <begin-date> <begin-time> <end-date> <end-time> <function> <log> <interval> <SMTWTFS> <status>

This command sets up the necessary parameters for a time-event.

Time-events are used to program the multiplexer to perform specified functions automatically at certain times of the day/month/year. Up to 64 different time-events may be programmed. The time-event functions use either a Saved Memory (see MS-SYSTEM-SETTINGS command) OR a CCL command string (see the MS-TIME-EVENT-COMMAND command).

NOTE: For additional information on the time-event parameters, please refer to Appendix B at the back of the manual.

Parameter values are defined as follows:

<item> 1 to 64 (time-event reference #)
NOTE: Event numbers from 59 to 64 are reserved for the menu time-events. For these events:
· Only the <begin-time>, <function>, <interval>,<SMTWTFS>, and the <status> information can be modified>
· The <interval> parameter can be set only as once (0) or daily (3).
· The <function> parameter can be set to only two values: 30 = record OFF, 31 = record ON.

<begin-date> MM DD YY (spaces between)

<begin-time> HH MM (24 hr format, 5 minute intervals)

<end-date> MM DD YY (spaces between) ;
00 00 00 (event has no end date)

<end-time> HH MM (24 hr format, 5 minute intervals) ;
00 00 (event has no end time)

<function> 20 to 25 (Restore settings from Save Memories 1 - 6) ;
101 to 116 (Execute the CCL command(s) specified by MS-TIME-EVENT-COMMANDS 101 through 116)

<log> 0 = No monitor message on time-event
1 = Display monitor message on time-event

<interval> 0 = Occurs only once
1 = Occurs every five minutes
2 = Occurs once an hour
3 = Occurs once a day
4 = Occurs once a month
5 = Occurs once a year

<SMTSTFS> 1 to 127 per table 8 format below:

Days:	Sa	Fr	Th	We	Tu	Mo	Su
Position (Bit#)	6	5	4	3	2	1	0
Mon to Fri Enabled:							
Table Value 62: (3E hex)	0	1	1	1	1	1	0

<status> 0 = Disabled
3 = Active (enabled)

MS-TIME-EVENT-COMMAND <command#> <"CCL command">

This command sets up a time-event by using a CCL command string in place of a complete memory restore. The CCL command will be acted upon instantly when received and will not require a system reset. The multiplexer can store up to 16 CCL command strings.

Parameter values for **<command#>** and **<"CCL command">** are as follows:

<command#>	101 to 116
<"CCL command">	Any legal CCL command(s) up to 127 characters in length (including the MS-TIME-EVENT-COMMAND command#, not including the quotation marks or separate multiple CCL commands using a semicolon.

EXAMPLE: : To enter the CCL command "MS-ALARM-ENABLE 65535" (to be used when Time-Event function 101 is specified as the action during a Time-Event), a value of 101 is used for <command #> and <"MS-ALARM-ENABLE 65535"> (surrounded by double quotation marks) is used for <"CCL command">.

Macro commands can also be created by combining more than one CCL command in the "CCL command" string (separated by semi-colons). In the following "Macro" command, all alarms and action detectors are enabled, and the VCR encode list is changed.

"MS-ALARM-ENABLE 65535; MS-ACTION-ENABLE 65535; MS-VCR-ENCODE-LIST 1 2 3 4 5 6 "

If a CCL command contains internal quotes, they must be typed twice (see the camera title below).

MS-TIME-EVENT-COMMAND 101 "MS-CAM-TITLE 1 ""LOBBY CAM"" "

NOTE: Commands are not checked for errors until execution by a time-event. A time-event can be set up to test them, or use the General Command EXECUTE-TEVENT (item) to cause a Time-Event to immediately occur (for test purposes only).

MS-TIME-EVENT-COMMAND 101 "MS-ALARM-ENABLE 65535"

MS-TIME-EVENT-CONTROL <action>

This command enables or disables time-event operation (providing more flexibility with keypad usage).

NOTE: If the local keypad is being used when a time-event is scheduled to occur, the time-event will be delayed until the keypad operation times out or is completed. Likewise, if a time-event is activating, the local keypad will be momentarily put on hold.

Parameter values for **<action>** are:

0	Disable all time-event operation (regardless of the individual status bits)
1	Enables time-event operation (per the time-events and the time-event status bits)

Note that the <status> value of each time-event command determines if an individual time-event is enabled or disabled.

MS-TIME-EVENT-STATUS <start-item> <end-item> <status>

This command allows you to enable or disable individual time-events. A range of time-events can also be enabled/disabled by specifying different start and end item parameters.

Parameter values for <start-item> , <end-item> , and <status> are:

<start-item>	1 to 64 (time-event reference#)	
<end-item>	1 to 64 (time-event reference#)	
<status>	0	Disable
	3	Active (Enable)

MS-VCR-ACTION-RECORD <vcr> <record mode>

This command sets the VCR response to an action.

Parameter values for **<vcr>** and **<record mode>** are as follows:

<vcr>	1	VCR output
	2	VCR/Monitor B output
<record mode>	0	OFF
	1	Exclusive (records only the action cameras)
	2	Interleave (records the action cameras in addition to the cameras specified by the MS-VCR-RECORD-LIST.

MS-VCR-ALARM-RECORD <vcr> <record mode>

This command sets the VCR response to an alarm.

Parameter values for <vcr> and <record mode> are as follows:

<vcr>	1	VCR output
	3	VCR/Monitor B output
<record mode>	0	OFF
	3	Exclusive (records only the alarm cameras)
	4	Interleave (records the alarm cameras in addition to the cameras specified by the MS-VCR-RECORD-LIST.

MS-VCR-CUSTOM <custom-vcr-model#> <vcr-mode> <hour-rate> <field-rate-MSB> <field-rate-LSB> <play-times>

This command sets the parameters for custom VCR definition.

Parameter values are as follows:

<custom-vcr-model#>	1 to 6 (corresponding to custom VCR setting 1 to 6)	
<vcr-mode>	1 to 20	
<hour-rate>		
<field-rate-MSB>		
<field-rate-LSB>		
<play-times>	0	SP
	1	LP

MS-VCR-MODEL <vcr> <vcr-model#>

This command defines the VCR attached to the <vcr> parameter to be the type corresponding to the <vcr-model#> parameter.

Parameter values are as follows:

<vcr>	1	VCR output
	2	VCR/Monitor B output

<vcr-model#> Defined as **<standard-vcr-model#>** OR **<custom-vcr-model#>** where:

<standard-vcr-model#> is:

7	PHILIPS_KV_7024
8	PHILIPS_TC3990A_SP_T120
9	PHILIPS_TC3990A_SLP_T120
10	PHILIPS_TC3991
11	MITSUBISHI_HS5440U
12	SANYO_SRT500
13	JVC_SR_L901U
14	PANASONIC_AG_RT600
15	SP_T120_FIELD
16	SP_T160_FIELD
17	SLP_T120_FIELD
18	SLP_T160_FIELD
19	SP_T120_FRAME
20	SP_T160_FRAME
21	SLP_T120_FRAME
22	SLP_T160_FRAME

<custom-vcr-model#> is:
1 to 6 (corresponding to custom VCR setting 1 to 6)

MS-VCR-PLAYBACK-ALGORITHM <algorithm>

This command sets the teletext algorithm for playback for all VCRs. If the unit is already in playback mode, the <algorithm> will not be effective until playback is switched off.

Parameter values for **<algorithm>** are as follows:

1	LTC2600	Burle 40-byte format
2	TC8989B	Burle 46-byte format
3	DMSX8	Dedicated Micros format
4	LTC8256	Robot format

NOTE: Please see the User Interface for the latest list of supported formats.

MS-VCR-RECORD-ALGORITHM <algorithm>

This command sets the teletext algorithm for record for all VCRs.

Parameter values for **<algorithm>** are as follows:

1	LTC2600	Burle 40-byte format
2	TC8989B	Burle 46-byte format
3	DMSX8	Dedicated Micros format
4	LTC8256	Robot format

NOTE: Please see the User Interface for the latest list of supported formats.

MS-VCR-RECORD-LIST <vcr> <camera list>

This command sets the record list for the VCR attached to the specified monitor.

Parameter values for **<vcr >** and **<camera list>** are as follows:

<vcr>	1	VCR output
	2	VCR/Monitor B output

<camera list> A list of camera numbers (1-16), up to 32 in the list, given in the order desired for the record list.

MS-VCR-RELAY <vcr> <responds to> <polarity>

This command sets the response and polarity for the relay connected to the VCR attached to the specified monitor.

Parameter values for **<vcr >, <responds to>**, and **<polarity>** are as follows:

<vcr>	1	VCR output
	2	VCR/Monitor B output
<responds to>	0	Neither
	1	Action
	2	Alarm
	3	Both
<polarity>	0	Normally open
	1	Normally closed

MS-VCR-TEST <boolean>

This command turns ON/OFF the VCR test mode. If ON, monitor A goes to full screen, and the data being received from the VCR is displayed on monitor A.

Parameter values are <0> for OFF, <1> for ON.

MS-VCR-TIMELAPSE <vcr> <timelapse-mode> <vcr-mode>

This command sets the timelapse mode for the VCR attached to the <vcr>…

NOTE to NHU-this description in the new CCL document is very confusing -- can we rewrite it?

Parameter values for **<vcr >, <timelapse-mode>**, and **<vcr-mode>** are as follows:

<vcr>	1	VCR output
	2	VCR/Monitor B output
<timelapse-mode>	1	Normal
	2	Action/Alarm
<vcr-mode>	1 to 20	

MS-VCR-TITLE <custom-vcr-model#> <text >

This command assigns a title to the custom VCR definition designated by <custom-vcr-model#>.

Parameter values are as follows:

<custom-vcr-model#> 1 to 6 (corresponding to custom VCR setting 1 to 6)

<text> (Use acceptable alpha/numeric characters-see Appendix A; only the first 12 characters of <text> will be used.)

MS-VCR-VEXT <vcr>

This command enables or disables VEXT input for the VCR.

Parameter values for **<vcr >** and **<boolean>** are as follows:

<vcr>	1	VCR output
	2	VCR/Monitor B output
<boolean>	0	Disables VEXT
	1	Enables VEXT

MS-VIDEOLOSS-OUT <polarity>

This command sets the output polarity for the VCR's videoloss relay.

Parameter values for **<polarity>** are:

0	Normally open
1	Normally closed

MS-VIDEOLOSS-OUT-ENABLE <boolean>

This command enables or disables the videoloss relay output.

Parameter values for <boolean> are:

0	Disables videoloss relay output
1	Enables videoloss relay output

MS-WINTER-TIME <date>

This command sets the date when the time-of-day clock will be put back by one hour (from Daylight Saving Time back to Standard Time). At 2:00 a.m. / 02:00 on the date set, the hour is put back to 1:00 a.m. / 01:00.

MS-ZOOM <monitor> <cameo#> <boolean>

This command enables or disables the zoom function for the specified cameo on the specified monitor.

NOTE: If the specified monitor is in full screen mode, the cameo specification is redundant (i.e. unnecessary). If the boolean parameter is 0, zoom is turned off, and the cameo specification is also redundant.

Parameter values for **<monitor>, <cameo#>** and **<boolean>** are:

<monitor>	1	Monitor A
	8	Monitor B
<cameo#>	1 to 16	
<boolean>	0	Disable
	1	Enable

MS-ZOOM-SCROLL <monitor> <direction>

This command scrolls the specified monitor display in the specified direction when in zoom mode.

Parameter values for **<monitor>** and **<direction>** are:

<monitor>	1	Monitor A
	2	Monitor B
<direction>	1	Up
	2	Right
	3	Down
	4	Left

SECTION 3: MULTIPLEXER READ (MR) COMMANDS

3.1 SUMMARY OF MR COMMANDS

Command	Returns Parameter(s)
MR-ACTION-ALARM-RELAY	<responds to> <polarity>
MR-ACTION-BEEPER	<boolean>
MR-ACTION-CAPTURE	<time>
MR-ACTION-ENABLE	<table 16>
MR-ACTION-HISTORY	<camera map>
MR-ACTION-SENSITIVITY <camera#>	<level>
MR-ACTION-SETUP	<boolean> <boolean>
MR-ACTION-ZONEDRAW	<zone draw setting>
MR-ACTION-ZONES <camera#> <map row#>	<zone map row>
MR-ACTIVE-CAMEO <monitor>	<cameo#>
MR-ADDRESS	<unit address>
MR-ALARM-BEEPER	<boolean>
MR-ALARM-CAPTURE	<time>
MR-ALARM-ENABLE	<table 16>
MR-ALARM-HISTORY	<camera map>
MR-ALARM-POLARITY	<table 16>
MR-ALARM-SETUP	<boolean> <boolean>
MR-AUTOPRINT	<boolean>
MR-CAM-AUTOCOLOR	<auto-detect>
MR-CAM-COLOR	<table 16>
MR-CAM-FULL <monitor>	<camera#>
MR-CAM-NUMBER	<starting-number>
MR-CAM-TITLE <camera#>	<"text">
MR-CAM-VIDEOLOSS-MESS	<table 16>
MR-DISPLAY-MODE <monitor>	<display-mode>
MR-FREEZE <monitor> <cameo#>	<boolean>
MR-HELP	N/A
MR-KEY-LOCKOUT	<boolean>
MR-LANGUAGE	<language>
MR-LOG-SETUP	<boolean> <boolean> <boolean> <boolean> <boolean>
MR-MODEL-NUMBER	<model#>
MR-MON-A-DISPLAY <mode>	<camera list>
MR-MON-BORDERS	<brightness>
MR-MON-LARGE-TEXT	<text-bright> <background-bright>
MR-MON-SMALL-TEXT	<text-bright> <background-bright>
MR-MON-TEXT	<brightness> <brightness>
MR-MON-TEXT-ENABLE <monitor>	<boolean>
MR-MON-TIME-DATE-FORMAT	<time-format> <date-format>
MR-MON-TIME-ENABLE <monitor>	<boolean>
MR-MON-TIME-POSITION	<location>
MR-OPERATION	<operation>
MR-OPERATION-SIMPLEX	<mode>
MR-OPERATION-DUPLEX	<mode-D1> <mode-D2>
MR-PASSWORD	<password>
MR-SEQ-DWELL <monitor> <mon-mode>	<time>
MR-SEQ-DWELL-TIME <seq-device>	<dwell-time>
MR-SEQ-ENABLE <monitor>	<boolean>
MR-SEQ-LIST <monitor> <display-mode>	<camera list>
MR-SEQ-MON-A <seq-mode>	<camera list>
MR-SEQ-MON-B	<camera list>
MR-SETUP-TITLE <setup#>	<text>
MR-STATUS	<camera map> <camera map> <camera map> <camera map> <camera map> <camera map> <setup#>
MR-SUMMER-TIME	<date>
MR-SYSTEM-SETTINGS	<setup#>
MR-TIME-EVENT <start-item> <end-item>	<item> <begin-date> <begin-time> <end-date> <end-time> <function> <log> <interval> <SMTWTFS> <status>
MR-TIME-EVENT-COMMAND <start-command#>	<end-command#> <command#> <"CCL command">
MR-TIME-EVENT-CONTROL	<action>
MR-TIME-EVENT-STATUS <start-item> <end-item>	<item> <status>
MR-VCR-ACTION-RECORD <vcr>	<record mode>
MR-VCR-ALARM-RECORD <vcr>	<record mode>

MR-VCR-CUSTOM <vcr-model#> <vcr-mode>	<custom-vcr-model#> <vcr-mode> <hour-rate> <field-rate-MSB> <field-rate-LSB> <play-times>
MR-VCR-MODEL <vcr>	<vcr-model#>
MR-VCR-PLAYBACK-ALGORITHM	<algorithm>
MR-VCR-RECORD-ALGORITHM	<algorithm>
MR-VCR-RECORD-LIST <vcr>	<camera list>
MR-VCR-RELAY <vcr>	<responds to> <polarity>
MR-VCR-TEST	<boolean>
MR-VCR-TIME-LAPSE <vcr> <timelapse-mode>	<vcr-mode>
MR-VCR-TITLE <vcr-model#>	<text>
MR-VCR-VEXT <vcr>	<boolean>
MR-VIDEOLOSS-OUT	<polarity>
MR-VIDEOLOSS-OUT-ENABLE	<boolean>
MR-WINTER-TIME	<date>
MR-ZOOM <monitor>	<cameo#> <boolean>

3.2 DETAILED DESCRIPTIONS OF MR COMMANDS

MR-ACTION-ALARM-RELAY

NOTE: This command returns the settings for Relay 1 only.

Parameter values returned are **<responds to>** and **<polarity>:**

<responds to>	0	Neither (never activates>
	4	Relay activates on action
	5	Relay activates on alarm
	6	Relay activates on action or alarm
<polarity>	0	Normally open (N/O)
	1	Normally closed (N/C)

MR-ACTION-BEEPER

This command reports the action beeper setting as follows:

0	Disabled
1	Enabled

MR-ACTION-CAPTURE

This command returns the action capture time setting.

Parameter values for **<time>** are any value from <3> to <60> seconds.

MR-ACTION-ENABLE

This command returns the values of enabled multiplexer action detectors corresponding to the values specified in a 16-position (bit) table. The value in each position of the table corresponds to the state of a specific action detector (a value of 1 represents an enabled action detector; a value of 0 is a disabled action detector).

Parameter values for **<table 16>** (returned value) range from **<0>** to **<65535> (decimal)** OR **<0>** to **<FFFF> (hex).**

MR-ACTION-HISTORY

This command returns the action status history for cameras in the <camera map>.

NOTE: The **<camera map>** consists of a 16-bit map with a bit for each camera in the multiplexer. The least significant bit corresponds to camera 1; the most significant bit corresponds to camera 16. A set bit corresponds to an enabled or active camera, depending on the contact.

MR-ACTION-SENSITIVITY <camera#>

This command returns the action detector sensitivity **<level>** for the specified camera.

Parameter values for **<camera# >** and **<level >** are as follows:

<camera# >	1 to 16
<level>	1 to 4 (with 4 being the highest sensitivity)

MR-ACTION-SETUP

This command returns the action manual reset and camera history settings, respectively.

Parameter values are:	0	Disabled
	1	Enabled

MR-ACTION-ZONEDRAW

NOTE: This command is only supported for binary protocol.

This command returns the setting for real-time zone drawing on monitor A.

Parameter values for **<zone draw setting>** are:

0	Disabled
camera#	Enabled; the specified camera is selected for monitor A in full-screen mode, and real-time drawing is enabled for that camera-overriding any other use of monitor A.

MR-ACTION-ZONES <camera#> <map row#>

This command returns the action zone map for the specified map row and camera number.

Parameter values for **<camera#>, <map row#>,** and **<zone map row>** are defined as follows:

<camera# >	1 to 16
<map row#>	1 to 16

<zone map row> A 16-bit word, corresponding to the map row points where the zone map bit 0 is the most right point, and the zone map bit 15 is the most left point.

MR-ACTIVE-CAMEO <monitor>

This command returns the active cameo for the specified monitor.

Parameter values for **<monitor>** and **<cameo#>** (returned value) are as follows:

<monitor>	1	Monitor A
	2	Monitor B
<cameo#>	1 to 16	

MR-ADDRESS

This command returns the unit address for the multiplexer

Parameter values for **<unit address>** (returned value) range from <1> to <30>.

MR-ALARM-BEEPER

This command returns the alarm beeper setting.

Parameter values are:	0	Disabled
	1	Enabled

MR-ALARM-CAPTURE

This command returns the specified duration for system indications of an alarm condition.

Parameter values for **<time>** (returned value) are any value from <3> to <60> seconds.

MR-ALARM-ENABLE

This command returns the values of enabled multiplexer alarms corresponding to the values specified in a 16-position (bit) table. The value in each position of the table corresponds to the state of a specific alarm (a value of 1 represents an enabled alarm; a value of 0 is a disabled alarm).

Parameter values for **<table 16>** (returned value) range from **<0>** to **<65535> (decimal)** OR **<0>** to **<FFFF> (hex).**

MR-ALARM-HISTORY

This command returns the alarm status history for cameras in the camera map.

NOTE: The **<camera map>** consists of a 16-bit map with a bit for each camera in the multiplexer. The least significant bit corresponds to camera 1; the most significant bit corresponds to camera 16. A set bit corresponds to an enabled or active camera, depending on the contact.

MR-ALARM-POLARITY

This command returns a 16-bit table value indicating the normally open and normally closed switches for alarms.

The **<table 16>** parameter ranges in value from **<0>** to **<65535> (decimal)** OR **<0>** to **<FFFF> (hex)** where the value in each table position corresponds to the type of a specific alarm switch (0 indicates normally open alarm switches; 1 indicates normally closed alarm switches.

MR-ALARM-SETUP

This command returns the alarm manual reset and camera history settings, respectively.

Parameter values are: 0 Disabled
1 Enabled

MR-AUTOPRINT

This command returns the setting for automatic printing of the log. If enabled, the command will take effect when the serial port function is set to PRINT.

Parameter values are: 0 Disabled
1 Enabled

MR-CAM-AUTOCOLOR

This command returns the setting for the multiplexer autocolor operation

Parameter values for <auto-detect> are:

0 Disables Autocolor
1 Enables Autocolor

MR-CAM-COLOR

This command returns a 16-bit table value indicating the settings for color operation of the cameras connected to the system.

The **<table 16>** parameter ranges in value from **<0> to <65535> (decimal)** OR **<0> to <FFFF> (hex)** where the value in each table position corresponds to the color operation of a specific camera (i.e. a value of 1 indicates enabled color; a value of 0 is disabled color operation).

MR-CAM-FULL <monitor>

This command returns the camera number (displayed in full screen) assigned to the specified monitor.

NOTE: If the monitor is not in full screen mode, the command has no effect.

Parameter values for **<monitor>** and **<camera#>** are:

<monitor> 1 Monitor A
2 Monitor B

<camera#> 1 to 16

MR-CAM-NUMBER

This command returns the starting camera number to be displayed on the monitor when the camera connected to rear panel camera input #1 is selected.

Parameter values for **<starting-number>** range from <1> to <983>.

MR-CAM-TITLE <camera#>

This command returns the camera title for the specified camera number.

Parameter values for **<camera#>:**

<camera#>	1 to 16

MR-CAM-VIDEOLOSS-MESS <table 16>

This command returns a 16-bit table value for the videoloss message status of individual cameras.

The **<table 16>** parameter ranges in value from **<0> to <65535> (decimal)** OR **<0> to <FFFF> (hex)** where the value in each table position corresponds to the video loss message status of a specific camera (i.e. a value of 1 indicates enabled video loss messages; a value of 0 is disabled video loss messages).

MR-DISPLAY-MODE <monitor>

This command returns the display mode for the specified monitor.

Parameter values for **<monitor>** and **<display-mode>** are:

<monitor>	1	Monitor A
	2	Monitor B
<display-mode>	0	Full Screen
	1	Single Quad
	7	3 x 3 Multi
	8	4 + 3 Multi
	9	12 + 1 Multi
	10	4 x 4 Multi
	11	8 + 2 Multi

NOTE: This command also returns a <screen-number> value which for quad modes represents the quad mode number.

MR-FREEZE <monitor> <cameo#>

This command returns the freeze function setting for the specified cameo on the specified monitor.

NOTE: If the specified monitor is in full screen mode, the cameo specification is redundant (i.e. unnecessary).

Parameter values for **<monitor>, <cameo#>** and **<boolean>** are:

<monitor>	1	Monitor A
	9	Monitor B
<cameo#>	1 to 16	
<boolean>	0	Disable
	1	Enable

MR-HELP

This command displays a screen of help instructions regarding MR command entry.

MR-KEY-LOCKOUT

This command returns the setting for the lockout flag for the front panel and external keypad.

Parameter values are:	0	Disabled
	1	Enabled

MR-LANGUAGE

This command returns the language setting for the multiplexer.

Parameter values for **<language>** are:

1	English
2	German
3	French
4	Spanish
5	Italian
6	Dutch

MR-LOG-SETUP

This command returns the settings for logging of the following system conditions: action, alarms, videoloss, events, and errors (respectively).

Parameter values (for each of the conditions above) are:

0	Disabled
1	Enabled

MR-MODEL-NUMBER

This command returns the multiplexer model number.

Parameter values which may be returned are:

LTC2681/50	16-channel extended color simplex, PAL
LTC 2681/60	16-channel extended color simples, NTSC
LTC2682/50	16-channel extended color duplex, PAL
LTC2682/60	16-channel extended color duplex, NTSC

MR-MON-A-DISPLAY <mode>

This command returns the camera list being displayed in the specified mode on

Monitor A.

Parameter values are:

<mode>	0	Full Screen
	1	Single Quad
	2	3 x 3 Multi
	3	4 + 3 Multi
	4	12 + 1 Multi
	5	4 x 4 Multi
	6	8 + 2 Multi

<camera list> (returned value) A list of camera numbers (values 1 to 16), up to 16 numbers (one for every cameo in the screen mode selected). The order depends on the screen mode selected (i.e. how cameos are arranged in the screen).

MR-MON-BORDERS

This command returns the setting for the border brightness for cameos shown on monitor A during multi-screen displays.

Parameter values for **<brightness>** are:

0	Transparent
1	Black
2-6	Grey*
7	White

*Note that all grey values (2-6) will be returned as 2.

MR-MON-LARGE-TEXT

MR-MON-SMALL-TEXT

These commands return the settings for text brightness and background outline brightness.

Returned parameter values for **<text-bright>** and **<background-bright>** are:

*Note that all grey values (1-7) will be returned as 1.

MR-MON-TEXT

This command returns the foreground and background brightness (respectively) for all text on all monitors.

Returned parameter values for **<brightness>** are:

0	Transparent
1	Black
2-6	Grey*
7	White

*Note that all grey values (2-6) will be returned as 2.

MR-MON-TEXT-ENABLE <monitor>

This command returns the setting for text display on the specified monitor.

Parameter values are:

<monitor>	1	Monitor A
	2	Monitor B
<boolean>	0	Disabled
(returned value)	1	Enabled

MR-MON-TIME-DATE-FORMAT

This command returns the formats for the time and date displayed on the monitor.

Returned parameter values are:

<time-format>	12	12 hr. mode
	24	24 hr. mode
<date-format>	1	MM DD YY
	2	DD MM YY
	3	YY MM DD

MR-MON-TIME-ENABLE <monitor>

This command returns the setting (enabled/disabled) for the time/date display for the specified monitor.

Parameter values are:

<monitor>	1	Monitor A
	2	Monitor B
<boolean>	0	Disabled
(returned value)	1	Enables

MR-MON-TIME-POSITION

This command returns the time/date display row position for any enabled monitors and for both small and large text. The row value corresponds to bottom, middle, or top of the screen.

Returned parameter values for **<location>** are:

0	Time/date display OFF
1	Time/date display ON
2-31	(NTSC) Display row position
5-33	(PAL) Display row position

MR-OPERATION

This command returns the current system operation mode.

Returned parameter values for **<operation>** are:

	1	live
	2	record
	3	playback
	4	playback-record (duplex and duplex/System4 only)
	5	record-record (duplex/System4 only)
	6	playback-playback (duplex/System4 only)

MR-OPERATION-SIMPLEX

This command returns the operating mode for simplex multiplexer models.

Returned parameter values for **<mode>** are:

	1	Monitor A - live digital, record OFF
	2	Monitor A - decoding, record OFF
	3	Monitor A - live analog, record ON

MR-OPERATION-DUPLEX

This command returns the operating modes for duplex multiplexer models.

Returned parameter values are:

<mode-D1>	1	Monitor A - live digital
	2	Monitor A - playback
	3	Record ON - System4 models only
<mode-D2>	0	Record OFF
	1	Record ON

MR-PASSWORD

This command returns the multiplexer password.

Returned parameter values for **<password>** are **<digit><digit><digit><digit>** where **<digit>** equals any number between 0 and 9.

MR-SEQ-DWELL <monitor> <mon-mode>

This command returns the sequence dwell time for the specified monitor in the specified display mode.

Parameter values are:

<monitor>	1	Monitor A
	2	Monitor B
<mon-mode>	1	Full screen mode
	2	Quad mode
<dwell-time>	0	Sequence disabled
(returned value)	1-60	Dwell time in seconds

MR-SEQ-DWELL-TIME <seq-device>

This command returns the sequence dwell time for the specified monitor in the specified display mode (<seq-device>).

Parameter values are:

<seq-device>	1	Monitor A - Full screen
	2	Monitor A - Quad
	3	Monitor B - Full screen
	4	Monitor B - Quad
<dwell-time>	0	Sequence disabled
(returned value)	1-60	Dwell time in seconds

MR-SEQ-ENABLE <monitor>

This command returns the setting (enabled/disabled sequencing) for the specified monitor if its display mode is Full or Quad.

Parameter values are:

<monitor>	1	Monitor A
	2	Monitor B
<boolean>	0	Disabled sequencing
(returned value)	1	Enabled sequencing

MR-SEQ-LIST <monitor> <display-mode>

This command returns the camera list being sequenced in the specified mode on the specified monitor.

Parameter values are:

<monitor>	1	Monitor A
	2	Monitor B
<display-mode>	0	Full screen
	1	Single quad
	2	3x3 multi
	3	4+3 multi
	4	12+1 multi
	5	4x4 multi
	6	8+2 multi

<camera list> A list of camera numbers (1-32) given in the order desired (returned value) for the sequence/display

MR-SEQ-MON-A <seq-mode>

This command returns the camera list being sequenced in the specified mode on monitor A.

Parameter values for are:

<seq-mode>	1-4	These values do not correspond to the 4 cameos in quad mode; any value 1-4 will be interpreted as single quad mode.
	5	Full screen
		NOTE: Selecting quad mode will loop between available quad modes.
<camera list> (returned value)	A list of camera numbers (1-16) given in the order desired for the sequence/display. Up to 32 camera numbers can be listed.	

MR-SEQ-MON-B

This command returns the camera sequence list for monitor B.

Returned parameter values for <camera list> are camera numbers (1-16) returned in the order set for the sequence/display. The sequence list can have up to 32 cameras.

MR-SETUP-TITLE <setup#>

This command returns the title (<text>) for the specified setup.

Parameter values are:

<setup#>	1-6	(Value corresponds to the desired setup.)

MR-STATUS <camera map> <camera map> <camera map> <camera map> <camera map> <camera map> <setup#>

This command is used to determine the videoloss, action, and alarm status of the multiplexer. Note that the camera map includes only cameras with videoloss, action, or alarm status message enabled.

Parameter 1 is a map of cameras with videoloss at the time the command was issued.

Parameter 2 is a map of cameras which had videoloss since the command was previously issued, including current status.

Parameter 3 is a map of cameras in alarm status at the time the command was issued.

Parameter 4 is a map of cameras which went into alarm since the command was previously issued, including current status.

Parameter 5 is a map of cameras with action at the time the command was issued.

Parameter 6 is a map of cameras which had action since the command was previously issued, including current status.

Parameter 7 (<setup#>) is the current setup number which may have been changed by a timed event.

MR-SUMMER-TIME <date>

This command returns the date when the time-of-day clock will be put forward by one hour (Daylight Saving Time). At 2:00 a.m. / 02:00 on the date set, the hour is advanced to 3:00 a.m. / 03:00.

MR-SYSTEM-SETTINGS

This command is used to determine the current active setup (<setup#>) of the multiplexer.

NOTE: Identical information is also available from the **MR-STATUS** command.

MR-TIME-EVENT <start-item> <end-item>

This command returns the time-event parameters for a selected single time-event (if <start-item> and <end-item> are the same value), or for a range of time-events.

Returned parameter values are defined as follows:

<item> 1 to 64 (time-event reference #)

<begin-date> MM DD YY (spaces between)

<begin-time> HH MM (24 hr format, 5 minute intervals)

<end-date> MM DD YY (spaces between) ;
00 00 00 (event has no end date)

<end-time> HH MM (24 hr format, 5 minute intervals) ;
00 00 (event has no end time)

<function> 20 to 25 (Restore settings from Save Memories 1 - 6) ;
101 to 116 (Execute the CCL command(s) specified by MR-TIME-EVENT-COMMANDS 101 through 116)

<log> 0 = No monitor message on time-event
1 = Display monitor message on time-event

<interval> 0 = Occurs only once
1 = Occurs every five minutes
2 = Occurs once an hour
3 = Occurs once a day
4 = Occurs once a month
5 = Occurs once a year

<SMTSTFS> 1 to 127 per table 8 format

<status> 0 = Disabled
3 = Active (enabled)

MR-TIME-EVENT-COMMAND <start-command#> <end-command#>

This command returns the command number and CCL command for a selected single command (if start and end command number parameters are the same), or for a range of command numbers. In binary mode, the second parameter (<end-command#>) is ignored.

Parameter values for **<start-/end-command#>** are: 101 to 116.

NOTE: If a range of command numbers is specified, each set of returned parameters (for each command number) will appear on a separate line.

MR-TIME-EVENT-CONTROL

This command returns the status (enabled/disabled) for time-event operation.

Parameter values are:

0	Disabled time-event operation (regardless of the individual status bits)
1	Enabled time-event operation (per the time-events and the time-event status bits)

Note that the <status> value of each time-event command determines if an individual time-event is enabled or disabled.

MR-TIME-EVENT-STATUS <start-item> <end-item>

This command returns the time-event status (<status>) per the parameters specified (may be a single time-event or a range of items). In binary mode, the second parameter (<end-item>) is ignored.

Parameter values are:

<start-item>	1 to 64 (time-event reference#)	
<end-item>	1 to 64 (time-event reference#)	
<status> (returned value)	0	Disabled
	1	None (no function assigned)
	2	Pending
	3	Active
	4	Finished

NOTE: If a range of item numbers is specified, each set of returned parameters (for each item number) will appear on a separate line.

MR-VCR-ACTION-RECORD <vcr>

This command returns the action record mode for the specified VCR.

Parameter values are:

<vcr>	1	VCR output
	2	VCR/Monitor B output
<record mode> (returned value)	0	OFF
	1	Exclusive (records only the action cameras)
	2	Interleave (records the action cameras in addition to the cameras specified by the MS-VCR-RECORD-LIST.)

MR-VCR-ALARM-RECORD <vcr>

This command returns the alarm record mode for the specified VCR.

Parameter values are:

<vcr>	1	VCR output
	2	VCR/Monitor B output
<record mode> (returned value)	0	OFF
	1	Exclusive (records only the alarm cameras)
	2	Interleave (records the alarm cameras in addition to the cameras specified by the MS-VCR-RECORD-LIST.)

MR-VCR-CUSTOM <custom-vcr-model#> <vcr-mode>

This command returns the parameters for the custom VCR definition specified by <custom-vcr-model#> and <vcr-mode>.

Parameter values are as follows:

<custom-vcr-model#> 1 to 6 (corresponding to custom VCR setting 1 to 6)

<vcr-mode> 1 to 20

<hour-rate> (returned)

<field-rate-MSB> (returned)

<field-rate-LSB> (returned)

<play-times> (returned)

0 SP
1 LP

MR-VCR-MODEL <vcr>

This command returns the VCR model number corresponding to the VCR attached to the output as defined by <vcr>.

Parameter values are as follows:

<vcr>
1 VCR output
2 VCR/Monitor B output

<vcr-model#> Defined as <standard-vcr-model#> (manufacturer/model#) OR <custom-vcr-model#> (corresponding to custom VCR setting 1 to 6)

MR-VCR-PLAYBACK-ALGORITHM

This command returns the teletext playback algorithm.

MR-VCR-RECORD-ALGORITHM

This command returns the teletext record algorithm.

MR-VCR-RECORD-LIST <vcr>

This command returns the record camera list for the VCR attached to the specified output.

Parameter values are:

<vcr>
1 VCR output
2 VCR/Monitor B output

<camera list> A list of camera numbers (1-16), up to 32 in the list,

(returned value) given in the order specified in the record list.

MR-VCR-RELAY <vcr>

This command returns the response and polarity for the relay connected to the specified VCR output.

Parameter values are:

<vcr>
1 VCR output
2 VCR/Monitor B output

<responds to>
0 Neither
1 Action
2 Alarm
3 Both

<polarity>
0 Normally open
1 Normally closed

MR-VCR-TEST

This command returns the status of the VCR test mode.

Parameter values are <0> for OFF, <1> for ON.

MR-VCR-TIMELAPSE <vcr> <timelapse-mode>

This command returns the timelapse, in hours, for the VCR attached to the specified output (<vcr>) in the specified mode.

Parameter values are:

<vcr>	1	VCR output
	2	VCR/Monitor B output
<timelapse-mode>	1	Normal
	2	Action/Alarm
<vcr-mode>	1 to 20	

MR-VCR-TITLE <vcr-model#>

This command returns the title of the VCR definition as specified by <vcr-model#>. (This includes the standard VCRs supported by the LTC2600, as well as titles assigned to the custom VCRs.)

Parameter values are as follows:

<vcr-model#> Defined as <standard-vcr-model#> (manufacturer/model#-values starting at 7) OR

<custom-vcr-model#> (corresponding to custom VCR setting 1 to 6)

NOTE: If a model is not defined for the specified number, the title returned is a blank, zero-length string. This feature can be used by the GUI or any external program to build menus of supported VCRs.

MR-VCR-VEXT <vcr>

This command returns the VEXT setting for the specified VCR output (<vcr>).

Parameter values are:

<vcr>	1	VCR output
	2	VCR/Monitor B output
<boolean>	0	Disables VEXT
(returned value)	1	Enables VEXT

MR-VIDEOLOSS-OUT

This command returns status of the output polarity for the VCR's videoloss relay.

Parameter values are:

0	Normally open
1	Normally closed

MR-VIDEOLOSS-OUT-ENABLE

This command returns the status (enabled/disabled) of the videoloss relay output.

Parameter values are:

0	Disabled videoloss relay output
1	Enabled videoloss relay output

MR-WINTER-TIME <date>

This command returns the date when the time-of-day clock will be put back by one hour (from Daylight Saving Time back to Standard Time). At 2:00 a.m. / 02:00 on the date set, the hour is put back to 1:00 a.m. / 01:00.

MR-ZOOM <monitor>

This command returns the zoom setting (cameo# being displayed and enable/disable status) for the specified monitor.

Parameter values are:

<monitor>	1	Monitor A
	2	Monitor B
<cameo#> (returned value)	1 to 16	
<boolean> (returned value)	0	Disable
	1	Enable

SECTION 4: GENERAL COMMANDS

4.1 SUMMARY OF GENERAL COMMANDS

Command	Function Description
ABBR <command> <text>	Defines an abbreviation to be used instead of the command string in the ASCII protocol.
AUX-OFF <camera#> <auxiliary#>	Deactivates the specified receiver/driver camera from its specified auxiliary function/position
AUX-ON <camera#> <auxiliary#>	Sends the specified receiver/driver camera to the specified auxiliary function/position
AUX-TGL <camera#> <auxiliary#>	Toggles the specified auxiliary function/position on the specified receiver/driver camera
CANCEL-AUX-LATCH <logical cam#>	Stops operation of a LATCH-AUX-ON or LATCH-AUX-OFF command on the specified receiver/driver camera
DATE	Displays the system date
!DATE	Sets the system date
DECIMAL	Selects decimal entry of numeric values
DEFAULT	Resets all system values to the Factory Default settings
GET-RS-232	Reads the RS-232 communication parameters
HEX	Selects hexadecimal entry of numeric values
LATCH-AUX-OFF <logical cam#> <auxiliary#>	"Unlatches" the specified auxiliary function/position on the specified receiver/driver camera
LATCH-AUX-ON <logical cam#> <auxiliary#>	"Latches" the specified auxiliary function/position on the specified receiver/driver camera
PREPOS <logical cam#> <pre-position#>	Sends the specified camera to the specified pre-position
PREPOS-SET <camera#> <pre-position#>	For the specified camera number in its current position, sets that position as the specified pre-position number
R/C <logical cam#> <OpCode#> <data>	Sets receiver/driver functions according to the parameters entered
REMOTE-TGL <camera#> <data1> <data2>	Sets the pan/tilt/zoom functions
RESET-SYSTEM	Resets system (simulates a power off/on cycle)
REVISION	Displays the current software revision number

SET-RS-232	Selects RS232 communication parameters
TEVENT-TBL	Displays all time-event settings in an easy-to-read table
TIME	Displays the system time
!TIME	Sets the system time
VARSPEED_PTZ <logical cam#> <pan speed> <tilt speed> <zoom speed> <function code>	Selects the variable speed functions of the AutoDome Series of dome cameras.

4.2 DETAILED DESCRIPTIONS OF GENERAL COMMANDS

ABBR <command> <text>

This command defines an abbreviation to be used instead of the command string in the ASCII protocol. A maximum of eight (8) abbreviations can be defined. Any additional definition will overwrite the oldest definition. Abbreviations are lost when the unit is powered OFF.

Parameter values are:

<command>

<text>

AUX-OFF <camera#> <auxiliary#>

This command deactivates the specified receiver/driver (<camera#>) from its specified auxiliary function/position.

Parameter values are:

<camera#> **1 to 16**
<auxiliary#> **1 to 7**

EXAMPLE: If auxiliary number 4 is to be activated on receiver/driver number 9, enter the following command:

LTC2600> **AUX-OFF 9 4**

AUX-ON <camera#> <auxiliary#>

This command sends the specified receiver/driver (<camera#>) to the specified auxiliary function/position.

Parameter values are:

<camera#> 1 to 16

<auxiliary#> 1 to 7

EXAMPLE: If auxiliary number 5 is to be activated on receiver/driver number 8, enter the following command:

LTC2600> **AUX-ON 8 5**

AUX-TGL <camera#> <auxiliary#>

This command toggles the specified auxiliary function/position on the specified receiver/driver (<camera#>).

Parameter values are:

<camera#> 1 to 16

<auxiliary#> 1 to 7

EXAMPLE: If auxiliary number 2 is to be toggled on receiver/driver number 6, enter the following command:

LTC2600> **AUX-TGL 6 2**

CANCEL-AUX-LATCH <logical cam#>

This command stops the operation of a **LATCH-AUX-ON** or **LATCH-AUX-OFF** command on the specified receiver/driver (<logical cam#>).

Parameter values are:

<logical cam#> 1 to 999 (maximum number of cameras)

EXAMPLE: To stop operation of a LATCH-AUX-ON command on receiver/driver number 8, enter the following command:

LTC2600> **CANCEL-AUX-LATCH 8**

(This command will cancel a continuously operating level adjustment started by **LATCH-AUX-ON** on an AutoDome camera.)

DATE

This command displays the system date if date is set in MM/DD/YY (otherwise order of year/month/day will be modified).

!DATE

This command sets the system date if format specified is MM/DD/YY (otherwise order of year/month/day will be modified). The year must be entered as a 2-digit number (e.g. <97> to <99> for 1997 to 1999; <00> to <96> are interpreted as 2000 to 209).

DECIMAL

This command selects decimal entry of numeric values.

DEFAULT

This command selects decimal entry of numeric values.

GET-RS-232

This command returns the RS-232 communication parameters: baud rate, data bits, parity, stop bits, and handshake (in that order). Parameter values are detailed in the

SET RS-232 command explanation.

HEX

This command selects hexadecimal entry of numeric values. In ASCII mode, this only affects input; output is always in decimal, compatible with TC82XXC. In binary mode, the radix applies to input and output.

LATCH-AUX-OFF <logical cam#> <auxiliary#>

This command "unlatches" the specified auxiliary function/position on the specified receiver/driver (<logical cam#>).

Parameter values are:

<logical cam#> 1 to 999 (maximum number of cameras)

<auxiliary#> 1 to 7

EXAMPLE: If auxiliary number 5 is to be "unlatched" on receiver/driver number 8, enter the following command:

LTC2600> LATCH-AUX-OFF 8 5

NOTE: This command is useful for making level type adjustments on the AutoDome Series cameras. Note that no action will result if the remote device being controlled does not support the auxiliary# value sent.

LATCH-AUX-ON <logical cam#> <auxiliary#>

This command "latches" the specified auxiliary function/position on the specified receiver/driver (<logical cam#>).

Parameter values are:

<logical cam#> 1 to 999 (maximum number of cameras)

<auxiliary#> 1 to 7

EXAMPLE: If auxiliary number 5 is to be "latched" on receiver/driver number 8, enter the following command:

LTC2600> **LATCH-AUX-ON 8 5**

NOTE: This command is useful for making level type adjustments on the AutoDome Series cameras. Note that no action will result if the remote device being controlled does not support the auxiliary# value sent.

PREPOS <logical cam#> <pre-position#>

This command sends the specified camera to the specified pre-position.

Parameter values are:

<logical cam#> 1 to 999 (maximum number of cameras)

<pre-position#> 1 to 99

EXAMPLE: If camera number 50 is to be sent to pre-position number 8, then enter the following command:

LTC2600> **PREPOS 50 8**

NOTE: Note that the range of valid pre-position numbers is from 1 to 16 for camera sites equipped with TC8561 Series receiver/drivers and from 1 to 99 for camera sites containing the newer TC8561A Series receiver/drivers. The AutoDome series of dome cameras will respond to either 66 or 99 pre-positions depending on the age of the model. Higher pre-position numbers (above 100) are also used to activate certain programming functions in the AutoDome series, but currently these are not supported in the TC8500 Series.

PREPOS-SET <camera#> <pre-position#>

This command sets the specified camera number's current position as the specified pre-position number.

Parameter values are:

<camera#> 1 to 16

<pre-position#> 1 to 99

EXAMPLE: If camera number10 is to be programmed for pre-position number 25, move the camera into the desired pan/tilt/zoom position, then enter the following command:

LTC2600> **PREPOS-SET 10 25**

NOTE: Note that the range of valid pre-position numbers is from 1 to 16 for camera sites equipped with TC8561 Series receiver/drivers and from 1 to 99 for camera sites containing the newer TC8561A Series receiver/drivers. The AutoDome series of dome cameras will respond to either 66 or 99 pre-positions depending on the age of the model. Higher pre-position numbers (above 100) are also used to activate certain programming functions in the AutoDome series, but currently these are not supported in the TC8500 Series.

R/C <logical cam#> <OpCode#> <data>

This command sets the receiver/driver functions according to the parameters entered (refer to the following chart for a detailed explanation of parameter values and associated functions).

Select the **<OpCode#>** (the OpCode# is used to identify the function group) and **<data>** information for the desired action according to the table below using the values corresponding to the existing numeric mode (Decimal or Hex):

OpCode# (hex)	OpCode# (decimal)	Data (hex)	Data (decimal)	Function
1	1	1	1	Turn Aux 1 ON
1	1	2	2	Turn Aux 1 OFF
1	1	3	3	Toggle Aux 1
1	1	5	5	Turn Aux 2 ON
1	1	6	6	Turn Aux 2 OFF
1	1	7	7	Toggle Aux 2
1	1	9	9	Turn Aux 3 ON
1	1	A	10	Turn Aux 3 OFF
1	1	B	11	Toggle Aux 3
1	1	D	13	Turn Aux 4 ON
1	1	E	14	Turn Aux 4 OFF
1	1	F	15	Toggle Aux 4
2	2	n=0 to F	n=0 to 15	Go to Prepos# (n+1)
3	3	t=0 to 7	t=0 to 7	Zoom IN for (t+1)/2 sec.
3	3	t=8 to F	t=8 to 15	Zoom OUT for (t-7)/2 sec.
4	4	t=0 to F	t=0 to 15	RIGHT for (t+1)/2 sec.
5	5	t=0 to F	t=0 to 15	LEFT for (t+1)/2 sec.
6	6	t=0 to F	t=0 to 15	DOWN for (t+1)/2 sec.
7	7	t=0 to 7	t=0 to 7	UP for (t+1)/2 sec.
A	10	t=0 to 7	t=0 to 7	Focus FAR for (t+1)/2 sec.
A	10	t=8 to F	t=8 to 15	Focus NEAR for (t-7)/2 sec.
B	11	1	1	Aux 5 ON
B	11	2	2	Aux 5 OFF
B	11	3	3	Toggle Aux 5
B	11	5	5	Aux 6 ON
B	11	6	6	Aux 6 OFF
B	11	7	7	Toggle Aux 6
B	11	9	9	Aux 7 ON
B	11	A	10	Aux 7 OFF
B	11	B	11	Toggle Aux 7
C	12	n=0 to F	n=0 to 15	Set Prepos# (n+1)

EXAMPLE: To activate pre-position # 16 on camera # 1, enter the following command:

LTC2600>**R/C 1 2 15**

Note that since the decimal mode is being assumed, the numeric value for the data was selected from the decimal column in the table. Also note that the actual number of seconds a time-dependent command will be activated may only approximate the value entered.

RESET-SYSTEM

This command resets the system (simulates a power off/on cycle).

REVISION

This command returns the current software revision.

EXAMPLE: For Engineering release E13 1.01, the value returned is:

LTC2600> E13 1 1

For full release 1.02, the value returned is:

LTC2600> 1 2

SET-RS-232 <baud> <data bits> <parity> <stop bits> <handshake>

This command sets the RS-232 communication parameters: baud rate, data bits, parity, stop bits, and handshake (in that order).

Parameter values are:

<baud>	0 / 1 / 2 (600 / 1200 / 2400)
	3 / 4 / 5 (4800 / 9600 / 19200)
<data bits>	7 or 8 (data bits)
<parity>	0 / 1 / 2 (none / even / odd)
<stop bits>	1 or 2 (stop bits)
<handshake>	0 or 1 (OFF / ON)

EXAMPLE: To select a baud rate of 9600, 8 data bits, no parity, 1 stop bit, and hardware handshaking off: <4> is used for "baud", <8> is used for "data bits", <0> is used for "parity", <1> is used for "stop bits", <0> is used for "handshake".

LTC2600> **SET-RS-232 4 8 0 1 0**

TIME

This command displays the system time.

!TIME

To set the time in the system, enter the time in the 24 hour format in the form below:

LTC !TIME 13 00 00

VARSPEED_PTZ <logical cam#> <pan speed> <tilt speed> <zoom speed> <function code>

This command selects the variable speed functions of the AutoDome Series of dome cameras. Once a variable speed command is received by the AutoDome, it will continue to operate until the "All Off" or another control command is received.

Parameter values are:

<logical cam#>	1 to 999 (maximum number of cameras)
<pan speed>	0 to F (hex)--where 0 = slowest, F = fastest
<tilt speed>	0 to F (hex)-where 0 = slowest, F = fastest
<zoom speed>	0 to 7-where 0 = slowest, 7 = fastest
<function code>	See following table

Function	Hex	Decimal
all off	000	0
pan right	001	1
pan left	002	2
tilt down	004	4
tilt up	008	8
zoom out	010	16
zoom in	020	32
focus near	040	64
focus far	080	128
iris close	100	256
iris open	200	512

Function codes may be added together to operate multiple functions with a single command line. Note that the current AutoDome series lens only provides two lens speeds. Speed values 0 to 4 will activate the slower speed and speed values 5 to 7 will activate the faster speed. Also note that this command is not supported on current TC8561 and TC8561A Series receiver/drivers.

EXAMPLE: If camera number 5 is to be panned left at maximum speed, enter the following command (hexadecimal mode shown):

LTC2600> VARSPEED_PTZ 5 F 0 0 2

APPENDIX A: CCL TECHNICAL REFERENCE MATERIALS

CCL Grammar and Parameter Definitions
Basic elements

digit:
0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

letter:
A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z

text:
letter
digit
space
*
+
-
,
.
/
:
|
i.e. A to Z (uppercase only), 0 to 9, space, * + , - . / : [ ]

boolean:
0 = FALSE, NO, OFF, DISABLED
1 = TRUE, YES, ON, ENABLED

year:
1997..2096

month:
1..12

day:
1..31

hour:
0..23

minute:
0..59

second:
0..59

numeric parameter:
[sign] [0 <radix prefix>] <digit> [digit..]

radix prefix:
hex prefix
decimal prefix
octal prefix
binary prefix

hex prefix:
x
X
decimal prefix:
d
D
octal prefix:
o
O
binary prefix:
b
B

string parameter:
" text "
text

Extended elements

auxiliary#:
1..7

algorithm:
1..4 (Provisionally, see User Interface for latest list of supported formats)

1 = LTC2600	Burle 40 byte format
2 = TC8989B	Burle 46 byte format
3 = DMSX8	Dedicated Micros format
4 = LTC8256	Robot format

brightness:
0„7
0 = Transparent
1 = Black
2-6 = Grey
7 = White

cameo#:
1..16

camera#:
1..16

<camera_list> = [<camera#]..
camera#
camera# camera_list

camera map:
16-bit map

A camera map consist of a 16-bit map with a bit for each camera in the multiplexer. The least significant bit corresponds to camera 1; the most significant bit corresponds to camera 16. A set bit corresponds to an enabled or active camera, depending on the context.

custom-vcr-model#:
1..6 corresponding to custom VCR setting 1..6.

date:
year month day if date format is YYYY/MM/DD
month day year if date format is MM/DD/YYYY
day month year if date format is DD/MM/YYYY

<direction> = 1..4
1 = up
2 = right
3 = down
4 = left

<display mode> =
0 = Full Screen
1 = Single Quad
2 = 3 x 3 Multi
3 = 4 + 3 Multi
4 = 12 + 1 Multi
5 = 4 x 4 Multi
6 = 8 + 2 Multi
10 = Dual Quad (Converted to SingleQuad)
11 = Triple Quad (Converted to SingleQuad)
12 = Quad Quad (Converted to SingleQuad)

<dwell time> = 0..60
0 = sequence disabled
1..60 = dwell time in seconds

<high-density> = <boolean>

<i2c device> =
1 decoder 1
2 decoder 2
3 encoder

<language> =
1 = English
2 = German
3 = French
4 = Spanish
5 = Italian
6 = Dutch

<location>
0 = Time\Date display OFF
1 = Time\Date display ON
2 .. 31 (NTSC), 5 .. 33 (PAL) = display row (Turns display ON if previously OFF)

<logical camera#> = 1..999

<map row#> = 1..16

<model number> = <family prefix> <feature digit> <digitiser count> / <pal/ntsc suffix>
<family prefix> = LTC26
<feature digit> = 4 | 6 | 8
4 = 9 channel standard colour
6 = 16 channel standard colour
8 = 16 channel extended colour
<digitiser count> = 1 | 2
1 = simplex model
2 = duplex model
<pal/ntsc suffix> = 50 | 60
50 = PAL model
60 = NTSC model

<monitor> = 1 | 2
1 = Monitor A
2 = Monitor B

<mon-mode> = 1 | 2
1 = Full mode
2 = Quad mode

<operation> = 1..6
1 = live
2 = record
3 = playback
4 = playback-record (duplex and duplex-extended only)
5 = record-record (duplex-extended only)
6 = playback-playback (duplex-extended only)

<pan speed> = 0..15

<password> = <digit> <digit> <digit> <digit>

<play-times> = 0 | 1
0 = SP
1 = LP

<polarity> = 0 | 1
0 = Normally open
1 = Normally closed

<pre-position#> = 1..99

<ptz code> = any combination of
0x000 All off
0x001 Pan right
0x002 Pan left
0x004 Tilt down
0x008 Tilt up
0x010 Zoom out
0x020 Zoom in
0x040 Focus near
0x080 Focus far
0x100 Iris close
0x200 Iris open

<r/c opcode> = 1 | 2 | 3 | 4 | 5 | 6 | 7 | 10 | 11 | 12

<r/c data> 0..15

<record mode> = 0 | 1 | 2
0 = Off
1 = Exclusive
2 = Interleave

<record speed> = 1..20

<responds to> = 0 | 1 | 2 | 3
0 = Neither
1 = Action
2 = Alarm
3 = Both

<revision> = <major revision> SPACE <minor revision> [SPACE E <engineering revision>]
<major revision> = <0..99>
<major revision> = <0..99>
<engineering revision> = <0..99>

<seq device> = 0 | 1 | 2
0 = MonA Full
1 = MonA Quad
2 = MonB Full

<seq mode> = 1..5
1..4= QuadA..QuadD
5 = Full

<setup#> = 1 | 2 | 3 | 4 | 5 | 6

<standard-vcr-model#> = from 7 on
Provisionally (see User Interface for latest list)
7 = PHILIPS_KV_7024
8 = PHILIPS_TC3990A_SP_T120,
9 = PHILIPS_TC3990A_SLP_T120,
10 = PHILIPS_TC3991,
11 = MITSUBISHI_HS5440U,
12 = SANYO_SRT500,
13 = JVC_SR_L901U,
14 = PANASONIC_AG_RT600,
15 = SP_T120_FIELD,
16 = SP_T160_FIELD,
17 = SLP_T120_FIELD,
18 = SLP_T160_FIELD,
19 = SP_T120_FRAME,
20 = SP_T160_FRAME,
21 = SLP_T120_FRAME,
22 = SLP_T160_FRAME

<tilt speed> = 0..15

<timelapse mode> = 1 | 2
1 = Normal
2 = Action/Alarm

<unit address> = 1..30

<vcr> = 1 | 2
1 = Vcr output
2 = Vcr/MonB output

<vcr-mode> = 1..20

<vcr-model#> = <standard-vcr-model#> | <custom-vcr-model#>

<zone draw setting> = 0 | <camera#>
0 = disabled

<zone map> = <16-bit map> x 16
An active zone map consists of a list of 16 unsigned short integers. Each 16 bit integer corresponds to the zone map for a single row on screen. Each bit on the integer corresponds to a single zone point. The most significant bit (b15) corresponds to the leftmost zone point in the row. The first integer in the list corresponds to the topmost row on the screen. A set bit corresponds to an active zone point.

<zoom speed> = 0..7

APPENDIX B: DETAILED COMMAND REFERENCE MATERIALS

Time-Event Parameter Definitions

ITEM
The Item number is a reference number to identify the Time-Event. When the system processes Time Events, it does so in order, from 1 to 64. If two different events are scheduled to occur at the same time, the first one in the table will execute just before the second one.

BEGINNING DATE AND TIME (START TIME)
This designates the starting time for an event. A Time Event will only occur between its start time and its end time. An event that is scheduled to take place only once (see of the interval value description) will happen at its exact begin time. Events can also be scheduled to repeat at certain intervals; the event will be active from its start time to its end time. The processes the Time Event Table once every five minutes, requiring the minutes portion of the time be a multiple of five. Do not use slashes or colons in Date or Time values.

ENDING DATE AND TIME (STOP TIME)
The end time specifies when a repeating Time Event should stop. It is entered the same as begin time. To ensure proper execution of an event, its end time should not be set to an earlier date than its begin time. To indicate that an event should never stop repeating, enter 0 for the month (in this case, 0's, or any date/time, may be entered for the rest of the Ending Date and Time values).

FUNCTION
The function value specifies what action is to take place for each event. The operations available to Time Event functions in the are listed in the MS-TIME-EVENT command description. The selected function will be automatically executed by the Time Event at the appropriate time(s). Some of the functions rely on the MS-TIME-EVENT-COMMAND strings to specify one or more CCL commands which will be executed when the Time-Event occurs.

IMPORTANT NOTES (PERTAINING TO THE USE OF CCL COMMANDS IN AND DURING TIME-EVENTS):

1. CCL commands that affect the operating modes of the multiplexer (such as the MS-MON-A-DISPLAY, MS-OPERATION-SIMPLEX, and the MS-OPERATION-DUPLEX commands) can be specified to activate during Time-Events; however, they will not have an effect on the Multiplexer® until after all other Time-Events specified to activate at a give time, have been activated. In addition, if the same command is used multiple times, during different Time-Events that activate at the same time, only the one in the last Time-Event executed will have any effect on the Multiplexer® operaion.
2. Do NOT send any CCL commands to the Multiplexer® while Time-Events are executing, since they may be overridden or may override the commands executed by the Time-Events themselves.

LOGGING (L)
Logging indicates whether the Time Event execution will cause a message to be sent to the console and displayed on the Multiplexer® Monitor A.

INTERVAL (INT)
This column determines how often an event will automatically repeat. Available intervals include: once, every five minutes, every hour, daily, monthly, and once a year. A value of "once" means that the event will only happen at its exact begin time. Other intervals (when they are shorter than the duration between the begin and end times) specify that the event will occur repeatedly from its begin time to its end time. An interval of five minutes means that the event will occur every five minutes. Other intervals are calculated relative to the begin time: if a daily event starts at 01/01/92 08:15, it will execute every day thereafter at exactly 8:15 AM.

SMTWTFS (SUNDAY THROUGH SATURDAY)
This value selects which days of the week on which a time event will execute.

STATUS (S)

This value shows a Time-Event's status. A time event will execute if and only if: 1) the current system time is between the events begin and end times, 2) the programmed interval has elapsed, 3) the event is allowed on that day of the week, and 4) the event is not disabled.
The status can be set using the MS-TIME-EVENT or MS-TIME-EVENT-STATUS command. A value of disabled or active (the event will execute if possible) are available.
When the MR-TIME-EVENT or MR-TIME-EVENT-STATUS command is used to read back a Time-Event or Time-Event Status, the Status data will reflect the internal Time Event status condition. Available values are disabled, none, pending, active, and finished.

Disabled: The user has disabled the event (either with the MS-TIME-EVENT or MS-TIME-EVENT-STATUS command, (or through the Multiplexer TIME-EVENTS Menu selection) so that it can not execute.

None: No function has been assigned to the event. Note, this does NOT indicate that a valid function exists, it merely indicates that a function number (20-26 or 101-116) has been assigned.

Pending: Indicates that the events begin time and date has not yet arrived (the event has not started execution).

Active: The current begin time and date have passed and the event is ready to be executed at the appropriate intervals.

Finished: The event end time has past (the event is no longer active).

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