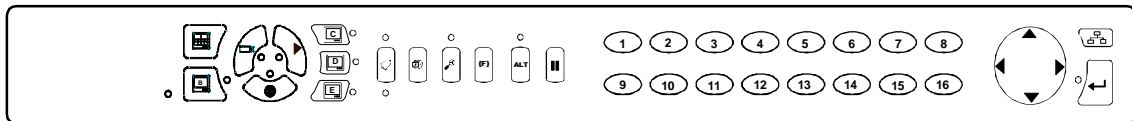




**MMX-165C(X)
SIXTEEN-INPUT, FIVE-OUTPUT
COLOR TRIPLEX MATRIX MULTIPLEXER**



USER MANUAL





WARNING!

To prevent fire and electric shock, do not expose this product to rain or moisture.

	
<p>The lightning flash with the arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the products enclosure that maybe of sufficient magnitude to constitute a risk of electric shock to persons.</p>	<p>The exclamation point, within an equilateral triangle, is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.</p>

	<p><u>CAUTION!</u> To prevent electric shock do not remove cover. No user serviceable components inside. Refer servicing to qualified service personnel.</p>	
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	<p><u>CAUTION!</u> Lithium Battery Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.</p>	<p><u>ATTENTION</u> This product contains a lithium battery. This battery may be recyclable. It may be illegal to dispose of this battery improperly under local, state, or federal laws. Check with your local waste management officials for disposal and recycling options.</p>
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	<p><u>CAUTION!</u> Electrostatic-Sensitive Device! Use proper CMOS and MOSFET handing precautions, including approved grounded wrists straps, etc., to avoid damage to this unit or its internal components, from electric discharge.</p>
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<p><u>WARNING!</u></p> <p>This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions in this manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to subpart J of part 15 of FCC rules which are designed to provide reasonable protection against such interference when operated in a commercial environment. This equipment has also been tested and found to comply with the requirements for a CE Class A device and TUV safety standards.</p> <p>Operation of this equipment in a residential area may cause interference, in which case the user is a required to take all measures that are necessary, at the user's expense, to correct the interference.</p>
--

IMPORTANT INFORMATION

Software and/or firmware is furnished to the purchaser under a license for use on a single system. Software and/or firmware included with this equipment are the sole proprietary property of, confidential to, and copyrighted by Kalatel, Corvallis, Oregon, USA. The software/firmware are not to be copied or disclosed in any manner without the express written consent of Kalatel.

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Contents

1	INSTALLATION AND GENERAL INFORMATION	1-1
1.1	Product Description.....	1-1
1.2	Features.....	1-2
1.3	Unpacking	1-3
1.4	Installation Environment	1-3
1.5	Default Passwords.....	1-3
1.6	The Front Panel.....	1-4
1.7	The Rear Panel.....	1-4
1.8	Connections	1-5
1.9	Power Supply	1-9
1.10	Power-Up and Testing.....	1-10
1.11	Battery Backed-Up Memory for Menu Options.....	1-10
2	OPERATING MODES AND CAPABILITIES	2-1
2.1	Principal Operating Modes	2-1
2.2	Triplex Operation	2-5
2.3	Monitor Displays	2-7
2.4	Salvo Switching	2-12
2.5	AutoList and Sequencing.....	2-14
2.6	Salvo Switching	2-15
2.7	Alarm Operations.....	2-15
2.8	Motion Detection.....	2-18
2.9	Freezing	2-19
2.10	Zooming.....	2-19
2.11	Daylight Savings Time Change.....	2-20
2.12	Macro Functions	2-20
2.13	Submacros	2-21
2.14	Front Panel VCR Controls	2-21
3	THE MENU SYSTEM.....	3-1
3.1	Pull-Down Menus	3-3
3.2	Pop-Up Menus.....	3-3
3.3	The Available Menus	3-3
4	OPERATOR PROGRAMMING.....	4-1
4.1	Operator Menu → Field/Frame Display.....	4-1

4.2	Operator Menu → Sequencing.....	4-1
4.3	Operator Menu → Time/Date Display.....	4-3
4.4	Operator Menu → Title Display.....	4-3
4.5	Operator Menu → Playback Format	4-3
4.6	Operator Menu → Alarm History	4-4
4.7	Operator Menu → Operator Password.....	4-4
4.8	Operator Menu → Normal Record Speed	4-5
5	INSTALLER PROGRAMMING	5-1
5.1	Main Menu → Time/Date.....	5-1
5.2	Main Menu → Sequencing.....	5-3
5.3	Main Menu → Record	5-4
5.4	Main Menu → Alarms.....	5-6
5.5	Main Menu → Macro	5-16
5.6	Main Menu → Macro → Edit Submacro	5-20
5.7	Main Menu → Motion Detection.....	5-23
5.8	Main Menu → Camera Titles	5-33
5.9	Main Menu → Camera Setup.....	5-34
5.10	Main Menu → VCR Setup	5-39
5.11	Main Menu → Communications.....	5-42
5.12	Main Menu → Front Panel Lock.....	5-43
5.13	Main Menu → Factory Settings.....	5-44
5.14	Main Menu → Passwords.....	5-44
6	SERVICE AND RETURNS.....	6-1
7	TECHNICAL SPECIFICATIONS	7-1
8	RS-232 REMOTE PROTOCOL	8-1
9	MACRO FUNCTIONS AND SCHEDULED MACROS.....	9-1
10	STANDARD WARRANTY CONDITIONS	10-1

1 INSTALLATION AND GENERAL INFORMATION

Table 1-1. Products Described in this Manual

Item	Model Number
Sixteen-Input, Five-Output Color Triplex Matrix Multiplexer	MMX-165C
Expansion Unit (increases maximum number of inputs to 32)	MMX-325CE
<p>Notes:</p> <p>Append (X) to the part number if ordering a PAL/CCIR model. (Otherwise, an NTSC/EIA will be shipped.)</p> <p>Example: MMX-165C(X)</p> <p>Key to model numbers:</p> <p style="text-align: center;"><u>MMX</u> - <u>16</u> <u>5</u> <u>C</u> (<u>X</u>)</p> <p style="text-align: center;">① ② ③ ④ ⑤</p> <p>① MMX = Matrix Multiplexer</p> <p>② 16 or 32 = Maximum number of cameras (16 for Multiplexer, 32 for Expander)</p> <p>③ 5 = Number of outputs</p> <p>④ C = Color, CE = Color Expander</p> <p>⑤ (X) = PAL/CCIR (if desired)</p>	

1.1 Product Description

These multiplexers are video recording and playback systems capable of simultaneously recording multiple camera signals on a single video cassette recorder (VCR). These units contain dual digital video processors for continued background recording while viewing multiscreen live or playback images.

The unit is a single, integrated unit in a 19-inch rack-mountable enclosure. It requires 12 V_{DC} power from an external AC power supply. The front panel contains all operator control keys and indicators. Looping auto-terminating video inputs, video outputs, alarm inputs and outputs, and remote control connectors are on the rear panel.

The unit has five monitor outputs, A through E.

- Monitor A:** A composite or Y/C SVHS full-screen or multiscreen digital image display that can be frozen and zoomed.
- Monitors B through E:** Full-screen, live, analog output displays.

WARNING!

The unit's primary purpose is to furnish efficient video multiplexing and multiscreen display. Alarm handling and motion detection are secondary functions.

The unit should not be the only alarm device on-site. Associated equipment must comply with national standards.

1.2 Features

- Quick installation and setup with programmable, easy-to-read on-screen menus
- AutoList™ simplified sequence programming
- Operator-programmable macro function keys
- Scheduling of macros to run automatically at preset times, days, and dates
- An adjustment for daylight savings time changes
- Master/slave timekeeping capabilities
- Remote programming (uploading and downloading) using a PC
- Remote control using optional keyboard or PC
- Menu-driven, adjustable camera automatic gain control (AGC)
- 2x digital zoom and digital pan and tilt in Live and Play modes
- Covert camera settings
- High quality color definition display (CCIR 601 4:2:2 YUV)
- Provision for synchronizing the multiplexer with the VCR speeds
- Multiple alarm inputs and outputs with an alarm history log
- Both activity and intrusion detection (video motion sensing)
- Front panel lockout
- Looping of camera output signals
- Ability to decode tapes recorded on Dedicated Micros (DM) and Robot multiplexers, allowing upgrades to obtain the advanced features of the units.
- Optional enhancements include motorized pan, tilt, and zoom control. Contact your dealer or distributor for more information on obtaining these enhancements.

1.3 Unpacking

Check the package and contents for visible damage. If any components are missing or damaged, contact the supplier immediately. **Do not attempt to use the unit.** If, for any reason, they must be returned, the package and contents must be shipped in the original packing box.

Package Contents

- Multiplexer unit
- Alarm I/O interface PCB
- Power adapter, AC to 12 V_{DC}
- User Manual
- Cable for Monitors C through E
- Cable for Expansion Unit

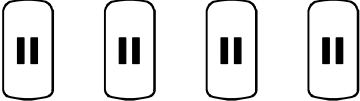



1.4 Installation Environment

- Install the multiplexer unit so that the cooling vents are not obstructed.
- Protect the unit from extreme hot or cold temperatures.
- Use an uninterruptable AC power supply (UPS).
- Do not place any weight that exceeds 35 lb. (16 kg) on top of the multiplexer.

The unit's technical specifications appear in Section 7, starting on page 7-1.

1.5 Default Passwords

Table 1-2. Passwords

Password	Access Level	Function	Changeable by User?	Default Keys
1	Operator	Gives access to Operator Menu and view screens	Yes	
2	Installer	Gives access to all menus	Yes	
3	Installer	Resets multiplexer to the factory defaults	No	
4	Installer	Changes the menu language factory defaults	No	

Three levels of password security are provided:

- Front panel lockout (no access)
- Operator access level
- Installer access level

All passwords changed by the user must be numerical. That is, only the number keys can be used when changing a password.

It is recommended that Password 1 be changed after installation is complete.

NOTE: As a security measure, store passwords in the Administrator's secured files or in a limited-access area.

1.6 The Front Panel

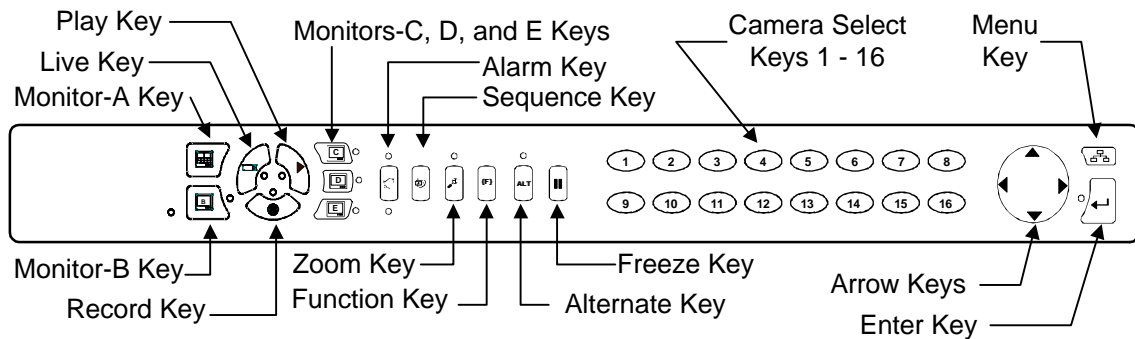


Figure 1-1. The Front Panel

1.7 The Rear Panel

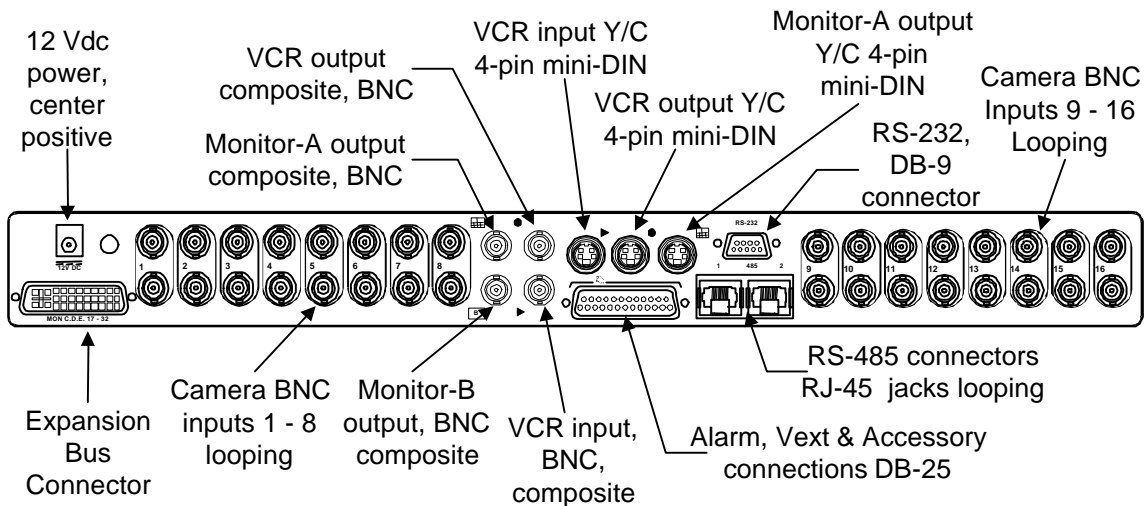


Figure 1-2. The Multiplexer's Rear Panel

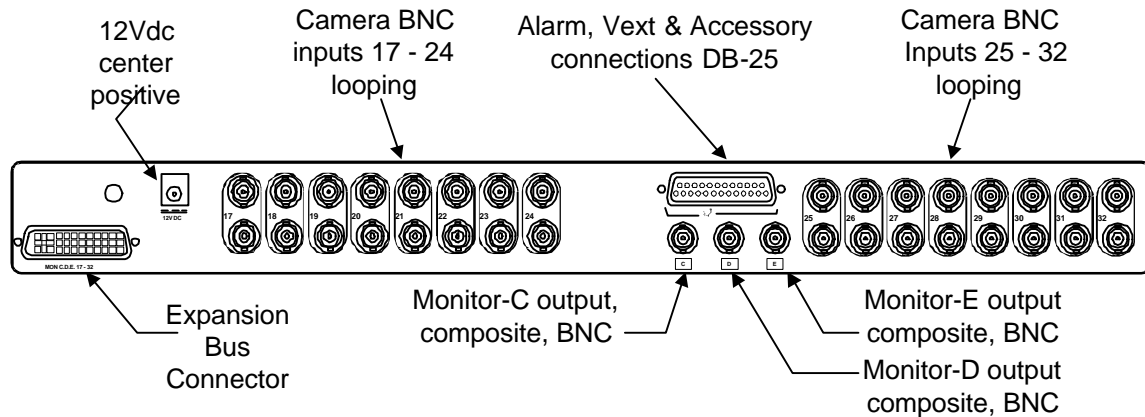


Figure 1-3. The Expansion Unit's Rear Panel

1.8 Connections

Camera Connections

When connecting cameras to the multiplexer, use only 75-ohm video coaxial cables and BNC connectors. For each camera, there are two BNC jacks. Either jack can receive a camera's signal. This signal is **looped** (directly connected) to the other jack, making the camera's signal accessible to other equipment.

When looping, the camera input connectors are auto-terminating. Make sure that there is a 75-ohm termination at the end of the video line.

If there are fewer than sixteen cameras, the unused camera jacks can be disabled through the menu system.

VCR Video Connections

As shown in Figure 1-4, the VCR video connectors are video IN and OUT. For a standard (composite) VCR use 75-ohm coaxial cable and BNC connectors. For a Super VHS (SVHS) VCR, use 4-pin mini-DIN SVHS connectors, and select SVHS in the VCR Setup menu.

NOTE: SVHS and composite connections can not be used at the same time. Select either composite or SVHS connections, depending on the VCR used.

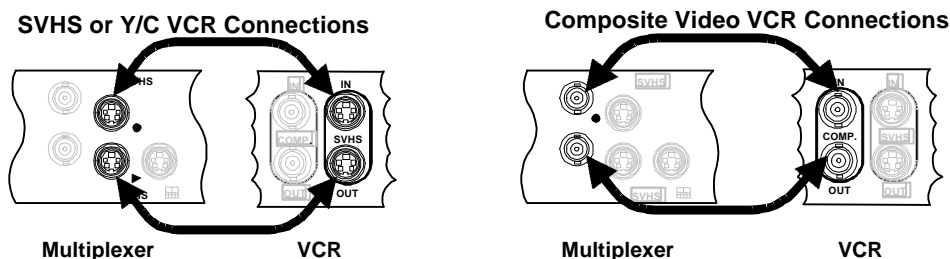


Figure 1-4. Typical Multiplexer-to-VCR Video Connections (SVHS or Composite)

Consult the VCR manufacturer’s instructions to connect:

This multiplexer jack:	Symbol :	To this VCR location:
Record OUT	●	Video IN
Play IN	▶	Video OUT

VCR Synchronization Connection

The use of the VEXT connection is recommended for time-lapse, high-density, and near-real-time VCRs.

NOTE: In this manual, real-time mode is defined as follows:

NTSC/EIA:	2 hours
PAL/CCIR:	3 hours

The VEXT signal simplifies multiplexer operation by synchronizing the multiplexer to the VCR. The VEXT signal is especially useful with VCRs having dual recording speeds (alarm and normal) because it makes the multiplexer automatically follow alarms.

Whenever an image is recorded, the VCR sends a VEXT camera switch pulse to the multiplexer. The multiplexer then transmits the next image to VIDEO IN on the VCR. In this way, the VCR controls the multiplexer’s recording speed.

If using the VEXT input, the Switch Input option must be enabled in the VCR Setup menu. (The factory default enables this option.) The VEXT Pulse Edge in the Record menu can be set to trigger on either the positive-going or negative-going edge.

NOTE: As a rule, the factory settings should not be changed.

Occasionally, Technical Support recommends different settings. For example, a user may experience a problem with VEXT or with a particular model of VCR.

The VEXT input accepts a TTL, field-synchronized, positive or negative pulse.

Consult the VCR manufacturer’s instructions to connect:

This multiplexer jack:	To this VCR location:
VEXT input wire (red) and ground wire (black)	The appropriate VCR terminals

NOTE: Some time-lapse VCRs do not transmit a VEXT signal in real-time mode. To use such VCRs, select recording speeds (in both the Alarm Record Speed and Normal Record Speed menus) that generate images at the rate required by the VCR.

In these cases, be sure to disable VEXT from the menus. Contact Technical Support if additional assistance is necessary.

Monitor Connections

Use 75-ohm coaxial cable to connect the monitors to the unit.

Alarm Connections

(See also **Alarm Operations**, page 2-15.)

Wire all alarm, relay, and VEXT connectors to the Alarm I/O PCB supplied. **Do not** attempt to wire directly to the connector on the multiplexer back panel.

If the Alarm I/O PCB is lost or missing, contact Kalatel Customer Service for a replacement. Alternatively, purchase a female DB-25 connector, and make all connections as shown in Table 1-3.

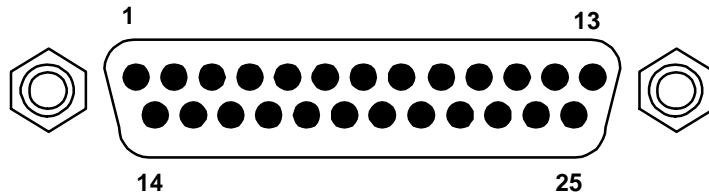


Figure 1-5. The Male DB-25 Connector (Rear Panel)

Table 1-3. DB-25 Pin Assignments

Function	DB-25 Pins
Alarm inputs 1 through 16	1 through 16
Alarm output 1 (Relay #1), selectable N/O or N/C	17
Ground connections: Alarms and VEXT inputs	18 through 20
Alarm output 1: Relay #1 common ground	21
Alarm output 2: Relay #2 (selectable N/O or N/C)	22
External Alarm silence or acknowledge (active-low)	23
VEXT, VCR synchronization pulse	24
Alarm output 2: Relay #2 common ground	25
<p>NOTE: N/O = normally open N/C = normally closed</p>	

Alarm Inputs and Outputs

Alarm inputs can be triggered by a relay contact from such devices as smoke detectors, infrared sensors, pressure pads, and the like. Be sure to connect only **resistive** loads to the alarm output relays. Alarms are disabled while the menu system is active.

The alarm output relays can be programmed in the menu system to respond to macro functions, alarms, and video loss.

NOTE: Do not exceed 30 V (AC or DC), 500 mA (continuous) on an alarm output relay's contacts. Specifically, the contacts must not be used at AC line voltages.

Silencing and Acknowledging Alarms

The silence-and-acknowledge function silences alarms by grounding pin 23 to pins 18 through 20. This operation merely deactivates the alarm LED, alarm output relay, and keyboard buzzer. But, the condition creating the alarm may still exist. Alarms can be programmed in any one of three ways:

- Latched On:** An alarm is active until it is silenced and acknowledged.
- Transparent:** An alarm is active only while the input is active.
- Timed Out:** An alarm is active until a menu-programmed time expires.

See Table 5-1 for more details.

1.9 Power Supply

NOTES: Be sure to read **Power-Up and Testing** below before applying power.

The multiplexer is furnished with a power supply as shown in Table 1-4.

Table 1-4. Multiplexer Power Supply

Input	
Voltage	110 to 240 V _{AC}
Tolerance	± 10%
Frequency	50 to 60 Hz
Output	
Voltage	12 V _{DC}
Power	25 W

NOTES: Do not use any other power supply.

The manufacturer accepts no responsibility for any damage caused by the use of any other power supply.

Read all the operating instructions before operating the unit.

1.10 Power-Up and Testing

Once the installation is complete, turn on the power in the order indicated below. The unit starts by displaying the software version on Monitor A. This is followed by a multiscreen display.

If any settings in the Menu system have been changed, those settings are stored while the power is off and are still in effect.

1. Energize the monitors and all the cameras.
2. After doing so, energize the unit's 12 V_{DC} power supply.
3. In Live mode, select full-screen display for each camera and check the picture quality. If the quality is poor, check:
 - The BNC connections
 - Loop-through terminations
 - Video levels of incoming signals and the possibility of ground loops.

Record/Play Quality

Record for at least three minutes at normal VCR speed (2-hour for NTSC/EIA, 3-hour for PAL/CCIR). Then play back the recording, selecting each camera for full-screen display in turn. Check the playback picture quality. Be sure to check the VCR's tracking adjustment. (For advice on setting up the cameras, consult the camera's installation instructions.)

Adjusting Playback Brightness and Contrast

The unit provides a simple front-panel digital adjustment to set the contrast and brightness of the playback signal from the VCR. (This can also be used to compensate for a VCR whose video output signal level is higher or lower than standard.)

Test the VCR VEXT switch pulse connection to the multiplexer by setting the unit to Record mode to start VCR recording. Observe that **REXT** (Record + **EXT**ernal) appears in the upper right corner while recording. Play back the recording, and observe that **PEXT** (Play + **EXT**ernal) appears in the upper right corner of the monitor.

See **Adjusting Playback Brightness and Contrast**, page 2-4.

1.11 Battery Backed-Up Memory for Menu Options

Menu selections are saved to battery-backed-up memory. In general, the battery has a five-year shelf life, and holds memory even if the unit is off for several months.

CAUTION: All stored information is lost if the battery is removed.
Moreover, when the system is re-energized, it reverts to factory defaults.

2 OPERATING MODES AND CAPABILITIES

2.1 Principal Operating Modes

The units have three principal modes of operation:

Table 2-1. The Three Principal Operating Modes

Mode	Key Number	Description
Live	1	Displays live images in full-screen or multiscreen formats
Play	2	Displays taped images in full-screen or multiscreen format
Record	3	Combines several camera input signals into one video output for the VCR. Because Record mode is always active in Duplex operation, this key works only on Simplex units.

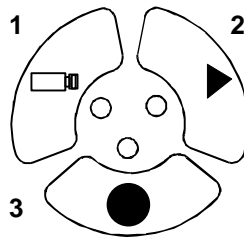


Figure 2-1. Front Panel Operating Keys

Live Mode

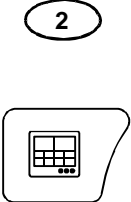
In Live mode, Monitor A displays multiscreen images of several cameras in selectable formats. Images on Monitor A are digital. They can be full-screen, multiscreen, frozen, or zoomed. These options are described later in this section.

Images on Monitors B through E are analog. Regardless of the mode selected, these monitors display only live, full-screen images from one camera.

Options Available on Monitor A Output in Live Mode

- Multiscreen displays from picture-in-picture (PIP) to 4x4 display of sixteen cameras (depending on the model). If a multiscreen does not include all cameras, the system can automatically sequence the remaining cameras into the last (bottom right) cameo.
- A full-screen display of any camera.
- A customizable sequenced display of full-screen cameras.
- 2x electronic zoom with the ability to pan and tilt across the entire image smoothly.
- Full-screen or individual cameo freezing capabilities.

Automatic Multiscreen Format Memory

	<p>The user can switch from a multiscreen to full-screen camera image by pressing the camera number key.</p> <p>Subsequently pressing the MULTISCREEN key (Monitor A Key in Figure 1-1) restores multiscreen display.</p>
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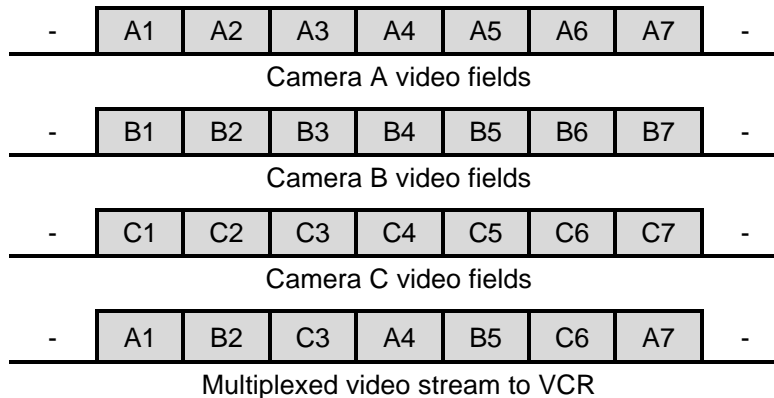
Record Mode

Time division multiplexing (TDM) combines several camera input signals into one video output signal. Single fields are digitally captured from each of the video-input channels, and then stacked consecutively to form a continuous video signal of time-sliced camera fields. (See the example below.)

Captured fields are controlled by the Record List, which the system modifies in case of alarms, motion detection, or video loss. A single VCR can then record the multiplexed video fields.

NOTE: Time base correction is performed during digital capture. As a result, cameras do not require synchronization.

For example, three multiplexed inputs are recorded like this:



On MMX units, Record mode is always active. It is not necessary to press the **RECORD** key.

In Live or Play mode, any Monitor A multiscreen function can be selected while recording. (See **Multiscreen Formats on Monitor A**, page 2-8.) When the unit and VCR are in Play mode, images on Monitor A come from the VCR tape. If the VCR is not in Play mode, the images on Monitor A come from the VCR output of the unit, not recorded images.

Record Speed Symbol on Monitor A

In Record mode, the unit indicates the recording speed on Monitor A. It uses the same time-format generally used by time-lapse VCRs. For example, **R024** appears for a unit recording in 24-hour mode. (If the VCR VEXT input is active, then **REXT** appears.)

Outputs from Monitors B through E

These monitors always display analog live full-screen images of camera output signals, regardless of its operating mode.

Alarm Displays in Record Mode

Alarm displays conform to the Live or Play modes of operation.

Play Mode

Playback of Multiplexed Recordings

Multiplexed recordings are time-stamped video fields received from the VCR. The embedded digital data packets are decoded, and all the associated status information, titles, time and date of recording (as well as the alarm or video loss status of the camera) are re-constructed and displayed with on-screen text during playback.

During playback, the user selects one of several screen formats, the fields to be displayed (or skipped), and the camera positions in multiscreen.

The difference between on-screen displays and VCR text displays recorded as part of video is this: on-screen display has clear, legible status and titles during playback.

In Play mode, the unit selects a multiscreen that displays all possible recorded images on Monitor A. The appearance of the letter **P** on-screen indicates that the unit is in Play mode. The speed at which the data was recorded appears after the **P** (as in **P002** or **P024**). If the recording was made using the camera switch input (VEXT), the mode and speed are displayed as **PEXT**. The time and date appear on-screen during Play mode. This is the time recorded on the tape, not the current system time. If video loss occurred while recording, a **V** appears in the corresponding camera cameo (**VDL** if full-screen display has been selected).

Features of Play Mode

- Play mode cancels any Live mode multiscreen images on Monitor A. (Monitors B through E always display full-screen live displays, and are not affected.)
- The unit can display video from a VCR whether or not the video input was multiplexed. See **Operator Menu** → **Playback Format**, page 4-3.
- The unit can properly interpret tapes encoded on Dedicated Micros or Robot multiplexers with an option in the Operator Menu Playback Format. This is useful in installations that already have other multiplexers.

Play Mode Sequencing During Playback

In the Play mode, multiscreens use the same dwell time as in Live mode, and full screens are sequenced according to the Sequence List and dwell times programmed with AutoList feature. See **AutoList and Sequencing**, page 2-13.

CAUTION: When sequencing a display during playback, set the VCR's playback speed faster than the dwell of cameras being played back. In this way, the tape runs more slowly than does the Sequence List that is actively switching through the Camera List.

EXAMPLE: If the VCR is set in the 48-hour mode, it displays the camera fields at approximately 5-second intervals. While a tape having multiple camera fields is played back, the fields for any one camera might not appear (since the sequence list may be switching between cameras faster than the VCR's Play setting).

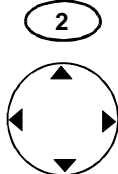
RECOMMENDATION: Set the VCR to its normal speed (2-hour for NTSC/EIA, 3-hour for PAL/CCIR) when sequencing the displays during playback.

NOTE: Tapes played back from different sites or setups may have nothing to do with the current setup of the unit. Consequently, the multiscreen sequencing option works only through those camera fields recorded on the tape. During Play mode, any video loss or disabled camera setups detected in Live or during recording are ignored.

Adjusting Playback Brightness and Contrast

The unit provides a simple front-panel method to digitally adjust the contrast and brightness of the playback signal from the VCR. (This can also be used to compensate for a VCR whose video output signal level is higher or lower than standard.)

VCR Signal

	<p>Using the camera keys, select the Play mode and the camera image to be enhanced full-screen on Monitor A.</p> <p>Adjust brightness with the up/down keys and the contrast with the left/right arrow keys.</p>
---	--

2.2 Triplex Operation


Triplex operation enables the simultaneous viewing of both Live and Playback video images (on Monitor A) while the unit continues to record. The user first selects Play mode in multiscreen format, and then selects the Triplex mode. The Monitor A multiscreen display is divided into areas for Playback and Live viewing.

Differences between Triplex and Duplex


- Duplex:** A Duplex unit can operate in two principal modes simultaneously. It always has the record mode active while the operator may choose either the Live or Play mode while the unit continues to record.
- Triplex:** A Triplex unit can operate in three principal modes simultaneously. Like a duplex unit, a Triplex unit always has the record mode active. But, in addition, a Triplex unit allows the operator to select both Live and Play modes simultaneously on Monitor A while the unit continues to record.

The unit must be in Play multiscreen before Triplex mode can be entered.

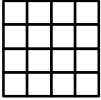
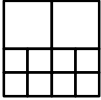
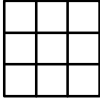
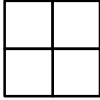
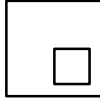
Entering Triplex Mode

	<p>Press the PLAY key while the unit is in Play mode. If in full-screen, the unit switches to a multiscreen. Border color changes from the standard gray to white.</p>
---	---


Exiting Triplex Mode

	<p>Press PLAY while the unit is in Triplex mode. The unit switches back to standard Play mode.</p>
---	---

The order in which the Triplex multiscreens appear each time the **MULTISCREEN** key is pressed and the Play/Live split is shown below:


				
Top 8: Play Bottom 8: Live	Top 2: Play Bottom 8: Live	Top 3: Play Bottom 6: Live	Top 2: Play Bottom 2: Live	Full screen: Play PIP: Live

Sequencing in Triplex Live Cameos

	<p>Pressing the SEQUENCE key while in multiscreen sequences all Live undisplayed cameras in the lower right cameo (at the multiscreen dwell time).</p> <p>No menu setup is required.</p> <p>Note that there is no programmable sequence list for multiscreens.</p>
---	---

NOTES: There is no programmable sequence list for multiscreens.
No playback cameo sequencing is supported in Triplex mode.

Triplex and Full-Screen Displays

<p>1</p> 	<p>Pressing a full-screen key selection shows the selected camera image in Play mode, but not Live mode.</p> <p>Subsequently pressing the MULTISCREEN key returns the unit to Triplex mode.</p>
--	---

Camera Position Selection for Active Cameos

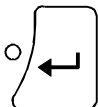
Triplex supports customary position and display selection with active cameos.

2.3 Monitor Displays

Changing Positions and Colors of Titles and Date/Time

Titles can be displayed as black, gray, or white characters. This feature is selectable for each camera during either Live or Play modes.

Change Position and Color

	Select a full-screen view of that camera on Monitor A, and then press ENTER several times to toggle the title position and color. Select from one of seven options for each camera.
---	--

Pressing the **ENTER** key initiates the following cycle:

1. Top, black.
2. Top, gray.
3. Top, white.
4. Bottom, black.
5. Bottom, gray.
6. Bottom, white.
7. Do not display this camera title.
8. (Repeats from top).

The color of the on-screen time and date on Monitor A can be changed to black, gray, or white

To change time and date color on Monitor A:

1. Select a camera for full-screen display.
2. Toggle its position and color as described above.

Each time the cycle is completed for the camera, the color of the time and date changes. The position of the time and date can not be changed.

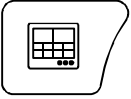
Once the color has been selected, the user can toggle the camera's title position, as well as its display color.

Monitor	Can Color be Changed?		Can Position be Changed?	
	Title	Time and Date	Title	Time and Date
A	Yes	Yes	Yes	No
B through E	No	No	No	No

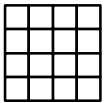
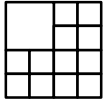
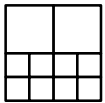
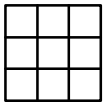
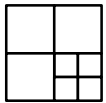
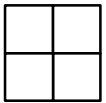
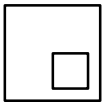
Multiscreen Formats on Monitor A

Monitor A formats are Full-Screen, Multiscreen, or Active Cameo.

Multiscreen Order of Display

	<p>Select different multiscreen displays by pressing the MULTISCREEN key (Monitor A Key in Figure 1-1) on the front panel.</p> <p>During start-up, the unit selects a multiscreen display on Monitor A that allows simultaneous viewing of all cameras recorded.</p>
---	---

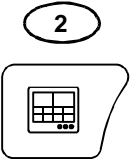
The multiscreen order of display changes and repeats each time the key is pressed:

						
16-WAY 4x4	13-WAY 1x12 ①	10-WAY 2x8	9-WAY 3x3	7-WAY 3x4 ①	QUAD 2x2	PIP 1 in 1
① Not available in Play mode on any units.						

NOTES: The best resolution for multiple camera images is furnished by **quad** display. Quad display is selected with the MULTISCREEN key (16-Way Key in Figure 1-1). Use the Active Cameo mode to select the cameras.

Display formats are operating parameters, not menu selections. They are saved in volatile memory, not in battery backed-up memory.

Automatic Multiscreen Format Memory

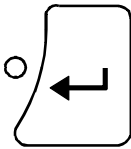
	<p>The user can switch from a multiscreen to full-screen camera image by pressing the camera number key.</p> <p>Subsequently pressing the MULTISCREEN key (Monitor A Key in Figure 1-1) restores the previous multiscreen display.</p>
---	--

Changing Cameras in Multiscreen Displays

Any camera can be displayed in any position in the unit's multiscreen displays. The default multiscreen displays show the cameras in ascending order. In the Live mode, the user can display one camera in more than one position, while in Play mode each camera can be displayed only once on each multiscreen. To select any camera for display in any cameo in a multiscreen, the unit uses **active cameos** (see below).

Active Cameo Mode

To select different cameras in a multiscreen display, the unit uses **active cameos**.

	<p>To select different cameras in a multiscreen display, the unit uses active cameos.</p> <p>Press the ENTER key while displaying any multiscreen. The top left cameo is the initial active cameo. The active cameo is indicated by flashing its camera number and title.</p> <p>The Active Cameo mode persists for about 15 seconds after the last key is pressed, or until the ENTER key is pressed again to exit the mode. Active Cameo mode is canceled if a new multiscreen display is selected, or if there is switching between Live and Play modes.</p>
---	---

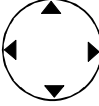
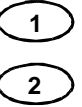

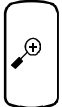
Working with an Active Cameo

In a multiscreen display, the user can freeze or unfreeze a cameo. This is useful when an event must be frozen for further investigation or for review by a supervisor, but the other cameras must be monitored.


Automatic Camera Location Memory

The user can set up camera numbers and locations to be displayed in a particular multiscreen display. Each time that particular multiscreen is selected, the setup appears. The unit saves this information in volatile memory.

Table 2-2. Key Functions During Active Cameo Mode

Key	Description	Function
	Arrow	Moves the active cameo around the multiscreen.
	Camera (1 through 16)	Selects a camera to be displayed in the active cameo. Once the desired camera is selected, the active cameo advances to the next logical cameo on the right.
	FREEZE	Freezes the active cameo.
	ZOOM	<p>Switches to a full-screen display of the active cameo.</p> <p>ZOOM cancels Active Cameo mode.</p> <p>Notice that if the ZOOM key is pressed with no active cameo selected, then the display switches full-screen to the camera displayed in the cameo last selected.</p>


Sequencing in Cameos

	<p>In multiscreen displays, pressing the SEQUENCE key advances all remaining cameras in the lower right cameo. (No menu setup is required. The cameo sequence list can not be edited.)</p> <p>The dwell time is the multiscreen dwell time selected in the menus. The default value is 3 seconds.</p>
---	--

Picture-in-Picture Display


The PIP display on Monitor A can be displayed in one of three sizes, and one of two positions. Select the PIP multiscreen for display on Monitor A.

PIP Size and Position

	<p>Position: Use the up/down arrow keys. The PIP can be placed at the upper left or lower right of the display.</p> <p>Size: The left arrow key makes the image smaller. The right arrow key makes it larger. The sizes can be 1/4, 1/9, or 1/16 of full-screen.</p>
---	---

Full-Screen Displays on Monitor A


Full-Screen Display

	<p>Select a full-screen display of any camera on Monitor A by pressing the camera number key.</p>
---	--



Full-Screen Sequence List and Dwell Time

Independent sequences operate on the monitors. See **AutoList and Sequencing**, page 2-13.

Full-Screen Sequencing on Monitor A

	<p>Select any full-screen display by pressing the camera number key, and then the SEQUENCE key.</p>
---	---

Canceling Full-Screen Sequencing on Monitor A

 	<p>Press either the SEQUENCE key (again), any camera number key, or any multiscreen key.</p>
--	---

Adjusting the Resolution

The resolution of digital full-screen displays can be toggled between frame display or field display. The lower resolution field display can result in less flickering on some high contrast camera scenes. Frame resolution is fully interlaced, and provides higher resolution. See **Operator Menu** → **Field/Frame Display**, page 4-1.

NOTE: This is a global system setting, and all camera displays are changed.

Displays on Monitors B through E

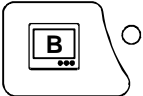
These are full-screen and analog, displaying only Live images (regardless of the mode selected). A sequenced or fixed display of any one camera can be selected on Monitors B through E.

CAUTION: The time, date, alarm, video loss messages, titles, and all on-screen data on Monitors B through E are related to current, live data, and must not be confused with the playback data that might be displayed on Monitor A.


Independent Sequence List and Dwell Times

Independent full-screen sequences may operate on Monitors A through E. See **AutoList and Sequencing**, page 2-13.


Operating on Monitors B through E

	Press the MONITOR key first. The LED lights until the same MONITOR key is pressed again. While the LED remains on, the camera keys and the SEQUENCE key operate on the selected monitor, and not on Monitor A.
--	---

Selecting a Camera Full-Screen on Monitors B through E


	While the monitor's LED is on, press a camera number key.
---	--

Starting Sequencing on Monitors B through E

	While the monitor's LED is on, press the SEQUENCE key.
---	---

Canceling Sequencing on Monitors B through E

To select a fixed display on Monitors B through E:

	While the monitor's LED is on, press either the SEQUENCE key or a camera number key.
---	--

2.4 Salvo Switching

Salvo Switching is a feature that enables Monitors B through E to sequence simultaneously among groups of cameras.

This option is **enabled** through the menu system. Once enabled, it can be **activated** (or deactivated) only by means of a password.

Activation of Salvo Switching

When Salvo Switching is activated, Monitors B through E sequence simultaneously, according to the parameters programmed in the menus. With Salvo Switching enabled, Salvo Switching is activated as follows:

1. Select a **monitor (B through E)** by pressing its button.
2. Press the **SEQUENCE** button.
3. Monitors B through E then begin simultaneous sequencing.

Deactivation of Salvo Switching

When Salvo Switching is deactivated, only the selected monitors can sequence. With Salvo Switching enabled, Salvo Switching is deactivated as follows:

1. Select a **monitor (B through E)** by pressing its button.
2. Press the **SEQUENCE** button.
3. Monitors B through E then stop sequencing.

Table 2-3. On-Screen Messages

Situation	Appearance on Screen		Appears on Monitor:
	Full-Screen	Multiscreen	
Alarm	The abbreviation ALM in each camera in alarm.	The letter A in each cameo in alarm.	Full-Screen: Both Multiscreen: A
Frozen	A flashing FRZ symbol in each frozen camera.	A flashing symbol in each frozen cameo.	
Video Loss (Live or Play mode)	The abbreviation VDL when the affected camera is displayed.	The letter V in each affected cameo.	
Motion Detection	When enabled in programming, the letter M appears in each camera scene when motion is detected. It remains on each active camera display for at least two seconds after the motion has ceased.	Both	
Record Speed	R### (such as R024 to indicate 24-hour mode). (If the VCR VEXT input is active, then REXT appears.)	A	
Playback	P### (such as P024 to indicate 24-hour mode). (If the recording was made using the camera switch input, VEXT, then PEXT appears.)		
Zoom	ZOOM (The ZOOM key's LED lights. The ZOOM key must be pressed again to return to normal.)		
Macro execution	Fn followed by the macro number. Example: Fn 02 .		
AutoList program (if active)	PGM		

Table 2-3 On-Screen Messages

Situation	Appearance on Screen		Appears on Monitor:
	Full-Screen	Multiscreen	
<p>A camera was not included in the Record List during recording.</p> <p>A camera was disabled during recording.</p> <p>The images for a camera on tape have been corrupted, and can not be decoded on playback.</p> <p>The VCR Play speed is very slow.</p> <p>During playback, a camera was not detected on tape for several consecutive cycles.</p>	<p>N/A</p> <p>(A warning message that appears only during playback on Monitor A.)</p>		

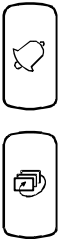
2.5 AutoList and Sequencing

The AutoList function lets the user change the default camera sequence and dwell settings, and can accommodate up to 32 cameras. The same camera can appear more than once in the sequence. The default dwell time is 3 seconds, and is set from the Operator or Main Menu.

Full-Screen and Multiscreen Dwell Time

In the Sequence menu, the user can select the dwell time for both full-screen and multiscreen.

Setting Up an AutoList Custom Sequence List on the Monitors

	<p>Press the ALARM and SEQUENCE keys simultaneously to record an AutoList sequence in full-screen mode (Live or Play). An on-screen indicator (PGM) appears on Monitor A.</p> <p>Press the camera keys in the sequence. After pressing a camera number key, pause for a time interval equaling the dwell time desired for that camera.</p> <p>Then press the next camera key, and so on.</p> <p>Press the SEQUENCE key to end AutoList recording.</p>
---	--

Pressing **any** key other than a valid camera key or the **SEQUENCE** key during recording voids the AutoList. To return to the factory default settings (all cameras included in the sequence list with a fixed dwell time), go to the Sequence menu, and change the dwell time.

NOTE:

The AutoList is erased whenever the Fullscreen Dwell setting is changed in the Sequence menu. All monitor sequences change to the new Fullscreen Dwell setting, with all cameras consecutively sequenced.

2.6 Salvo Switching

This feature must be programmed and activated from the menu system. See Section 0.

2.7 Alarm Operations

The system is equipped with one alarm input per camera, each normally associated with its live video input. An alarm input displays on-screen warnings on the monitors, flashes front panel LED, and sounds an internal buzzer. Record List priority automatically changes.


Two internal isolated alarm output relays are provided. Both can be activated by any alarm input, manually or by the built-in motion detection sensors. Each input alarm can be programmed to activate either of the relays, both, or none.

During alarms, the unit can automatically record alarmed cameras more frequently. Macro functions can be activated by an alarm input, and execute several pre-recorded keystrokes automatically. Any alarm input can be enabled or disabled. See **Main Menu** → **Alarms**, page 5-6.

Programmed and Manual Alarm Capabilities

Alarms can be programmed to:

- Activate either one or both of the Alarm Output Relays.
- Latch until reset, timed-out (latched for a preset time), operate as transparent, and follow the status of the alarm input, either in-alarm or normal.
- Activate a pre-programmed macro.
- Activate the internal buzzer.

	<p>Manual Alarm Activation (Simulated Alarm): Simultaneously pressing the ALARM key and a CAMERA number key simulates an actual alarm.</p> <p>Silencing and Acknowledging Alarms: To silence and acknowledge all displayed alarms, press only the ALARM key.</p>
---	---

The pre-programmed alarm responses run automatically when an alarm is manually initiated. Programmed parameters control the alarm, camera recording, latching mode, buzzer setting, and relays.

Alarm Displays in Live and Record Modes

During alarms in Live mode, Monitor A switches to a pre-programmed, multi-screen alarm display (assuming that the programmer has not specified full-screen alarm displays). Depending on how the alarm is programmed, a monitor other than A is simultaneously switched full-screen to the camera in alarm.

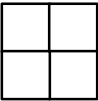
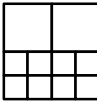
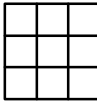
NOTES: The custom alarm screens on Monitor A are displayed only while the alarm is active. Once the alarm times out or is cleared, the display reverts to the screen displayed before the alarm. As a result, it is very important to select the best alarm-latching mode for alarm displays.

If the user changes the screen format while an alarm is active, then the unit continues to display the selection after the alarm clears. It does not revert to the pre-alarm screen display.

Monitor A Multi-Screen Display During Alarms

During alarms in Live mode, Monitor A shows a customized display indicating the camera in alarm together with three associated cameras. The programmer can also select whether or not the system should freeze the camera in alarm when the alarm input is received.

Depending on the number of simultaneous alarm inputs, the customized alarm displays are selected by the multiplexer to show all cameras in alarm, as well as plus associated cameras. The custom screens are automatic for up to three simultaneous alarms. The displays are as follows.

	First Alarm	Second Alarm	Third Alarm
			
Cameras in alarm	Top left cameo	Top two cameos	Top three cameos
Associated cameras	The remaining cameos	Three of the four cameos below each top cameo	The remaining cameos

Displays for More than Three Simultaneous Alarms

If more than three alarms are active at the same time, the unit selects a display format that shows all the cameras in alarm. Associated cameras are not selected for display, and alarms are not frozen. This is usually a 9-way display (unless more than nine cameras are in alarm at the same time). As each new alarm is received, the unit adjusts the display.

Full-Screen Displays on Monitors B through E During Alarms

Salvo Switching Disabled

During alarms, the monitor (B through E) designated as Aux Monitor in the menu switches to a full-screen display of the camera in alarm. The other monitors continue to display their current cameras and not change due to alarm.

If multiple alarms are active, the designated Aux Monitor sequences among the alarm cameras at a fixed 1-second dwell, which is not programmable. Monitors B through E cannot freeze images on alarm.

Salvo Switching Enabled

During alarms, the Aux Monitor setting has no effect. Monitors B through E switches to a full-screen display of the cameras programmed as the Input Group in the Alarm Action Setup menu.

For example, if input alarm 01 is activated, Group 01 cameras display on Monitors B through E.

If multiple alarms are active, Monitors B through E sequence between the alarm camera Groups at a fixed 1-second dwell. This dwell is not programmable. Monitors B through E cannot freeze images on alarm.

NOTE: The Monitors B through E screens do not revert to original fixed displays after the alarm is cleared. They continue to display the last alarm camera. But, if sequencing was active on Monitors B through E before the alarm, then Monitors B through E continue to sequence after the alarm is cleared.

If the user changes the screen format while an alarm is active, then the unit continues to display the selection after the alarm clears. It does not revert to the pre-alarm screen display.

Full-Screen Alarm

If the programmer does not install Monitors B through E and relies solely on Monitor A for all system information, a full-screen alarm display on Monitor A may be preferred to the custom multiscreen displays.

In this case, the programmer can select a menu option in the Alarms menu that makes Monitor A:

- Switch to a full-screen display of the camera in alarm.
- Sequence full-screen between multiple alarms (as Monitors B through E normally do).

The custom alarm screens do not appear. (This is a global setting for all cameras).

If the option was selected in the Alarm Action menu, a single full-screen alarm is not frozen.

Alarm LED and Internal Buzzer in Live Mode

An alarm LED is provided on the front panel above the ALARM key. This LED flashes until:

- A Live alarm is silenced or acknowledged (latched and timed-out alarms).
- The alarm times out or returns to normal status (timed-out and transparent alarms).

An internal buzzer sounds while the alarm condition exists. This buzzer can be disabled only through the Installer menu.

If the Monitor A screen format is changed while an alarm is active, the unit continues to display the selection after the alarm is silenced and acknowledged. It does not revert to the pre-alarm screen display.

The Monitor B screen does not revert to its original fixed display after the alarm is silenced and acknowledged. It continues to display the last alarm camera. But, if sequencing was active on Monitor B before the alarm, then Monitor B continues to sequence after the alarm is silenced and acknowledged.

Alarm Displays in Play Mode

Recorded Alarms

In the Play mode, Monitor A does not provide custom alarm displays based on recorded alarm status. Rather, it displays the playback images from the VCR according to the selected formats. It displays the normal **A** alarm indicator only if a camera was in alarm at the time that a recording was made.

CAUTION: The Monitor B time, date, alarm, video loss, titles, and all on-screen data are related to current, live data, and must not be confused with the playback data that might be displayed on Monitor A.

If the camera is not being displayed, no on-screen indication of an alarm appears. When searching during playback for cameras in alarm, make sure all cameras on tape are displayed using a 16-channel multiscreen.

Monitor B during Play Mode

Monitor B continues to display live images according to any programmed parameters. If a Live alarm occurs during Play mode, Monitor B switches to the camera in alarm. It sequences at a 1-second dwell time for multiple cameras in alarm. After the alarm is canceled, Monitor B continues to display the camera on the screen at the time the alarm was canceled (or else continues to sequence if sequencing was enabled).

Alarm Symbols

Multiscreen Displays: The letter **A** appears on-screen in each cameo in alarm.

Full-Screen Displays: The abbreviation **ALM** appears on-screen in each camera in alarm.

Alarm History and Log

An alarm history is kept in a cyclic buffer. History data, including camera number and time and date, is kept in memory. The most recent 100 alarm events can be viewed on-screen by selecting Alarm History from the Operator Menu.

A table appears, allowing the user to browse forward and backwards. Each event links the time of occurrence with an alarm-input number. The RS-232 port allows uploading the alarm history to a PC or similar remote control device.

2.8 Motion Detection

These units offer complete motion detection including built-in false alarm rejection, sensitivity settings, and size discrimination per camera. Motion detection is used to adjust the rate at which cameras are recorded (Activity Detection), and as an intrusion alarm sensor to trigger an alarm input (Intrusion Detection). The ability to reduce false motion alarms is a major difference between intrusion detection and activity detection.

Activity Detection

Activity detection looks for luminance changes in selected areas of the screen. Changes above a set threshold are interpreted as activity. Changes in light and camera vibration may be falsely interpreted as activity. This type of motion detection is offered by most multiplexers, and is adequate to detect activity in a scene when false detection is not important. Typically, activity detection is used in crowded areas, where motion is not the result of intruders, and where movement is normal and expected.

Intrusion Detection


Intrusion detection looks for unusual movement in the scene. If any is found, an alarm is generated. This feature is used to monitor areas where no movement is allowed or expected. When movement is found in such an area, an intruder has probably caused it. It is important that intrusion detectors not cause false alarms resulting from light changes, random reflections, or camera vibration.

If an alarm input is activated by one of the unit's internal motion detector channels, the system does not differentiate between an input from another alarm sensor, and the input activated by the link from the internal motion detection.

Symbols

When enabled in programming, the letter **M** appears in each camera scene where motion is detected. This **M** remains on each active camera display for at least two seconds after the motion has ceased.


2.9 Freezing

	<p>The FREEZE key is used to freeze and unfreeze displays. In the Live and Play modes, use this key to freeze displays on Monitor A. Frozen full-screen images can be zoomed (see below).</p> <p>The freeze is not available on Monitors B through E.</p>
---	--

Working with an Active Cameo

In a multiscreen display, the user can freeze or unfreeze a cameo. This is useful when an event must be frozen for further investigation or for review by a supervisor, but the other cameras must be monitored. See **Live Mode**, page 2-1.

Symbols

A flashing on-screen display of the symbol  in each frozen cameo (**FRZ** on full-screen displays). The **PAUSE** key must be pressed again to unfreeze the display. Frozen images can be zoomed.


Most other keys are disabled while freezing is in effect.

NOTE: If the **FREEZE** key is pressed in a multiscreen display, the entire multiscreen is frozen.


2.10 Zooming

The unit provides a digital 2x zoom for full-screen displays on Monitor A in the Live and Play modes. This feature is not available on Monitors B through E.

Zooming an Image

	<p>First select a full-screen display on Monitor A, and then press the ZOOM key. Zooming works with both frozen and non-frozen displays. A zoomed image can be frozen.</p>
---	---

Electronic Pan and Tilt

	<p>Use the arrow keys to pan and tilt to different sections of zoomed displays on Monitor A.</p>
---	---


Symbols

- The word **ZOOM** appears on-screen. In addition, the ZOOM key's LED lights
- The **ZOOM** key must be pressed again to return to normal.
- Most other keys are disabled while zooming is in effect.

NOTE: If the **ZOOM** key is pressed in a multiscreen display, the image in the last active cameo selected expands to full-screen.

2.11 Daylight Savings Time Change

The unit provides a simple way to adjust for daylight savings time, using the **FUNCTION** and **SEQUENCE** keys.

	<p>To adjust the clock by one hour for daylight savings time changes, press FUNCTION, and then SEQUENCE.</p>
---	--

In April, time adjusts forward one hour. In October, time adjusts back one hour.

This function can be used only once in each period. For example, if the **FUNCTION** and **SEQUENCE** keys are pressed during April, an hour is added to the time. If these keys are pressed again, the command is ignored until October.

2.12 Macro Functions

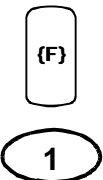
Macro Functions enable the recording of frequently used key sequences and menu setups. These sequences run in two-keystroke settings.

Depending on the number of cameras and the model type, up to ten or sixteen macros, each having up to 32 keystrokes can be programmed.

Macros can be programmed to start at a fixed day and time. Scheduled events can be started on a preset day and time or at the same time every day. Any macro can be started by each of the twenty scheduled events, and a macro can be started by more than one event.

For easy reference, tables are provided in the back of this manual to record scheduled events and macros.

Running a Macro

	<p>A macro can be manually activated by pressing the FUNCTION key, followed by the CAMERA key that corresponds to the macro number (1 through 16). A macro can be canceled with the FUNCTION key.</p> <p>While a macro is playing, the letter F and the macro number appear.</p>
---	---

2.13 Submacros

Macros generate RS-232 commands that can communicate with other RS-232 devices. Submacros are programmed within a macro.

A submacro transmits a programmed string of bytes from the RS-232 port of the multiplexer. Its purpose is to communicate with other RS-232 devices, such as VCRs. This permits RS-232 control of VCR functions.

The use of submacros increases the flexibility of the multiplexer by enabling the transmission of an RS-232 message when a macro is activated. Macros can be timed, linked to alarms, or manually activated from the front panel or keyboard. A submacro programmed into a macro runs along with the keystrokes recorded in a stored macro.


2.14 Front Panel VCR Controls

The unit can control the following VCR functions through the front panel keypad.

Play	Frame Advance
Record	Frame Reverse
Rewind	Stop
Fast Forward	Freeze

To make these control functions accessible, the multiplexer must be connected to the VCR through the RS-232 port. The installer must program this operation.

To Control the VCR Functions

	<p>First, activate the Alternate mode by pressing the red ALT key on the keypad.</p> <p>The ALT key is a toggle on/off key. A red LED above the ALT key lights when the mode is active. When the mode is active, the associated VCR function keys are operational.</p> <p>The VCR function keys are identified with red symbols for the action they perform while in this mode.</p>
---	--

The VCR functions keys activated in the Alternate mode are as follows:

Function	Key	Indicator [†]
Play	PLAY	VCR PLAY
Record	RECORD	VCR REC
Rewind	Left Arrow	VCR REW
Fast forward	Right Arrow	VCR FF
Frame advance	Up Arrow	VCR F ADV
Frame reverse	Down Arrow	VCR F REV
Stop	ENTER	VCR STOP
Pause	FREEZE	VCR PAUSE
[†] In the Alternate mode, on-screen indicators appear for a few seconds after the selected function is initiated. These indicators appear in any monitor display mode.		

NOTE: To turn off the Alternate mode and return to normal keypad operations after performing the VCR functions, press the **ALT** key again.

3 THE MENU SYSTEM

A Word About Notation

In the and following chapters, there are section headings like these:

Main Menu → Camera Titles
Meaning:
From the Main menu, select **Camera Titles**, and press the **ENTER** key.

Main Menu → Sequencing → Multiscreen Dwell
Meaning:

1. From the Main Menu, select Sequencing, and press the **ENTER** key.
2. This opens another menu. In this menu, select **Multiscreen Dwell**, and press the **ENTER** key.

When the indicated steps have been carried out, a menu or box appears, a discussion of which completes the section.


These sections are either numbered, or else preceded by this symbol: □

In some boxes, particular items are **highlighted** on the screen. They can be distinguished as follows:

<p>Not highlighted:</p> <div style="border: 1px solid black; padding: 5px; display: inline-block;">Camera 03</div>	<p>Highlighted:</p> <div style="border: 1px solid black; padding: 5px; display: inline-block;">ENABLE</div>
---	---

The unit provides user-friendly on-screen menus for entry of data such as titles or selecting options. The options can also be accessed through the RS-232 port from a central controller or PC.

NOTE: The ALARM key and on-screen symbols are disabled while the menu system is active.



When **MENU** key is pressed, the **Password Box** appears.

<p>For example, this box appears for a Calibur 16-camera unit running version 2.01 software.</p>	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="background-color: #cccccc;">Password Box</td> </tr> <tr> <td style="background-color: #cccccc;"> <p>MMX-165C Ver 2.01 Please Enter the Password!</p> <p>----</p> </td> </tr> <tr> <td style="background-color: #cccccc;"> </td> </tr> </table>	Password Box	<p>MMX-165C Ver 2.01 Please Enter the Password!</p> <p>----</p>	
Password Box				
<p>MMX-165C Ver 2.01 Please Enter the Password!</p> <p>----</p>				

To enter the on-screen program menus, enter the 4-key password. The default passwords are:

To enter the on-screen menus, enter the 4-key password. The default passwords are:

FRZ, FRZ, FRZ, FRZ for the operator.
3, 4, 7, 7 for the installer.

The defaults are set when units are shipped from the factory. These passwords can be changed in the menus.

The Menu Bar displays all the programmable options in logical sub-sections. Four menu levels are designed for ease in moving through them.



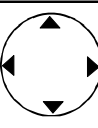
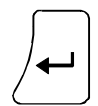


The Installer password gives access to all four menus. The Operator password, on the other hand, gives access only to the Operator and SystemView Menus. If an Operator tries to access the other two menus, a password dialog box opens.

The QuickInstall section is a basic set of menu items that provide a quick installation setup.

NOTE: Each section in this manual gives a description of choices that are programmable through the menus. Read these sections in their entirety before programming menu options.

Keys for Operating and Entering Menus

 	<p>Use the ENTER key to go to the next menu level or to accept a parameter. Use the MENU key to exit, or to back up one menu level, without making any changes to the current level.</p>
 	<p>To access a menu, use the arrow keys to select, and then press the ENTER key. Arrow keys can also be used to change values or parameters in some of the menus.</p>

3.1 Pull-Down Menus

Pull-down menus are the top-level menus. Additional selections are available in the menus, and choices are typically made in pop-up menus. To exit a pull-down menu, select Exit, and press **ENTER** or the **MENU** key.

3.2 Pop-Up Menus

Pop-up menus are lower-level menus. Use the **up/down arrow** keys to select sections in the pop-up menu, and then use the **left/right arrow** keys to change values.

To exit a Pop-up menu without making changes, press the **MENU** key or else select Cancel and press the **ENTER** key. To exit and save the changes made, select OK and press the **ENTER** key.

CAUTION: Pressing **MENU** to exit from a menu does not save the changes made in that menu. In this instance, the MENU key has the same effect as does the selecting Cancel and then pressing the **ENTER** key.

3.3 The Available Menus

Highlight the selection using the left or right arrow keys, and press **ENTER** or the **down arrow** key.

When selected, one of the menus shown below appears on Monitor A.

Main	QuickInstall	Operator	SystemView
Time/Date	Change the Time	Field/Frame Display	View Screen 1
Sequencing	Change the Date	Sequencing	View Screen 2
Record	Edit Camera Titles	Time/Date Display	View Screen 3
Alarms	Camera Disable	Title Display	View Screen 4
Macro	Normal Record Speed	Playback Format	View Screen 5
Motion Detection	SVHS/Composite	Alarm History	View Screen 6
Camera Titles	VCR Level Type	Operator Password	Exit
Camera Setup	Installer Password	Normal Record Speed	
VCR Setup	Auto Disable Now	Exit	
Communications	Exit		
Front Panel Lock			
Factory Settings			
Passwords			
Exit			

The Main Menu

The Main Menu provides access to all the programmable options in logical sub-sections.

Read the corresponding section in the manual before starting to program the options in the menus.

Time/Date
Sequencing
Record
Alarms
Macro
Motion Detection
Camera Titles
Camera Setup
VCR Setup
Communications
Front Panel Lock
Factory Settings
Passwords
Exit

Main Menu → Time/Date

Use this menu to specify:

- Which monitors (if any) are to display the time and date.
- What time and date formatting to use.
- The time and date.
- Whether the unit is a master or a slave.

There can be only one master unit. It transmits time and date information on the RS-485 line. Slave units receive this information.

Time/Date Display
Set Time Format
Set Date Format
Set Time
Set Date
Set Master/Slave
Exit

Main Menu → Sequencing

Use this menu to specify:

- Multiscreen dwell time (used for the sequencing cameos in the multiscreen mode).
- Live full-screen dwell times (used when the **SEQUENCE** key is pressed).
- Play full-screen dwell times (used when the **SEQUENCE** key is pressed).
- How groups of cameras switch simultaneously on Monitors B through E.

The camera sequence list is programmed through the AutoList feature.

See **Installer Programming**, page 5-1.

Multiscreen Dwell
Live Full Dwell
Play Full Dwell
Salvo Switching
Exit

Main Menu → Record

Use this menu to specify:

- The order in which images are to be recorded from the different camera inputs. Use this selection to increase the update rate of more important cameras.
- Normal recording speed.
- Alarm recording speed (typically 2-hour for NTSC/EIA, 3-hour for PAL/CCIR).

Record List
Normal Record Speed
Alarm Record Speed
Exit

Main Menu → Alarms

Use this menu to specify:

- Whether the alarm input for each camera is N/O or N/C.
- Whether the alarms are Latched, Transparent, or Timed-Out.
- How to display associated cameras; What action to take when an alarm is received; How to set up a Salvo Switching group.
- External alarm action (for future use, not yet implemented).
- How the images from the alarmed cameras are to be recorded (Interleaved, Exclusive or, No Change).
- Whether some or all of the alarms are to be enabled or disabled.
- Viewing of the history for the last 100 alarms.
- Which macro runs when an alarm is received.
- Alarms are to be displayed in full-screen mode only.
- Whether the alarm output relays are N/O or N/C.
- What activates the buzzer.
- What action is taken when video loss occurs.

Input Configuration
Alarm Latch
Alarm Action
External Alarm Action
Record Mode
Enable/Disable
Alarm History
Link to a Macro
Fullscreen Alarm
Relay Configuration
Buzzer Setup
Video loss Action
Exit

Main Menu → Macro

Use this menu to:

- Initiate macro recording (and specify which macro is to be recorded).
- Specify the parameters and schedules governing automatic macro execution.
- Initiate submacro editing (and specify which submacro is to be edited).
- Activate automatic transmission of the Play and Record submacros to the VCR.

Macro Record
Timed Macro Start
Edit Submacro
PLAY/RECORD Link
Exit

Main Menu → Motion Detection

Use this menu to specify for each camera:

- Whether motion detection is enabled.
- Which zones in the camera's view are to be active for motion detection.
- Whether a motion detection indicator is to be displayed on the monitor.
- Whether Activity Detection or Intrusion Detection is desired.
- Motion detection adjustments, the record rate to be used, and the output relay to be activated (if required).

Enable/Disable Detection
Setup Active Zones
Indicate Detection
Activity/Intrusion
Setup Parameters
Exit

Main Menu → Camera Titles

Use this menu to specify:

- Which monitors (if any) are to display the camera titles.
- The titles of each camera.

Title Display
Edit Titles
Exit

Main Menu → Camera Setup

Use this menu to specify for each camera:

- The AGC setting.
- Whether the camera is enabled or disabled.
- Whether the camera is Covert (not viewed on Live display).

With **Camera Scope**, the user can display a digital representation of the unit's view of the incoming signals.

Also, use this menu to specify for each camera:

- Whether field or frame resolution is to be used in full-screen.
- Whether the Expansion Unit is connected.
- Whether a camera is color or monochrome.

Camera AGC
Camera Disable
Covert Camera
Camera Scope
Field/Frame Display
Camera Selection 16/32
Color/Mono
Exit

Main Menu → VCR Setup

This menu lets the user:

- Select between SVHS and VHS (composite) tape.
- Enable or disable VEXT.
- Specify either a positive or negative VEXT pulse.
- Specify the VCR level.
- Specify the playback format for proper tape decoding.

SVHS/Composite
Switch Input ON/OFF
Switch Edge
Signal Level
Playback Format
Exit

Main Menu → Communications

Use this menu to specify:

- The communication settings to be used for the RS-232 port.
- The unit's unique network address on the RS-485 bus.

RS232
RS485
Exit

Main Menu → Front Panel Lock

Use this menu to lock and unlock the front panel keyboard.

Unlock Keyboard
Lock Keyboard

Main Menu → Factory Settings

CAUTION!

Entering **8,1,1,1**
resets **ALL settings** (except time and date)
to the factory defaults!

Password Box
Please enter the Factory Password

[CANCEL] [OK]

Main Menu → Passwords

Use this menu to change the passwords for the menu system.

Installer Password
Operator Password
Exit

The QuickInstall Menu

The QuickInstall Menu presents options already discussed for the Main Menu. See **The Main Menu**, page 3-4.

These options are required:

These options are not required, but are recommended, especially if VEXT is not used, or SVHS is desired:

Read the corresponding section in the manual before starting to program the options in the menus.

Change the Time
Change the Date
Edit Camera Titles
Camera Disable
Normal Record Speed
SVHS/Composite
VCR Level Type
Installer Password
Auto Disable Now
Exit

The Operator Menu

The Operator Menu provides access to many of the programmable options.

Read the corresponding section in the manual before starting to program the options in the menus.

Field/Frame Display
Sequencing
Time/Date Display
Title Display
Playback Format
Alarm History
Operator Password
Normal Record Speed
Exit

Operator Menu → Field/Frame Display

With digital full-screen displays, the Field and Frame settings switch the resolution between field and frame displays. The lower resolution field displays result in less flickering on some high-contrast camera scenes. The default setting is **Frame**.

Field/Frame Setup	
Display :	Frame
[CANCEL]	[OK]

NOTE: This is a global system setting, and affects all cameras.

A symbol appears next to the time/date of Camera 1 when called to full-screen display. Field resolution appears as a hyphen (-) when Camera 1 is selected. Frame Resolution displays no hyphen when selected.

Operator Menu → Sequencing

Use this menu to specify:

- Multiscreen dwell time (used for the sequencing cameos in the multiscreen mode).
- Live full-screen dwell times (used when the **SEQUENCE** key is pressed).
- Play full-screen dwell times (used when the **SEQUENCE** key is pressed).
- Whether or not Salvo Switching is to be enabled;
The order in which camera groups are to be displayed.

Multiscreen Dwell
Live Full Dwell
Play Full Dwell
Salvo Switching
Exit

The camera sequence list is programmed through the AutoList feature.

Camera groups are programmed by the installer.
See **Installer Programming**, page 5-1.

Operator Menu → Time/Date Display

Use this box to specify which monitors (if any) display the time and date.

Time and Date Display	
Monitor A :	<input checked="" type="checkbox"/> ON
Monitor B :	ON
Monitor C :	ON
Monitor D :	ON
Monitor E :	ON
[CANCEL]	[OK]

Operator Menu → Title Display

Use this box to specify which monitors (if any) display camera titles.

Titles Display	
Monitor A :	<input checked="" type="checkbox"/> ON
Monitor B :	ON
Monitor C :	ON
Monitor D :	ON
Monitor E :	ON
[CANCEL]	[OK]

Operator Menu → Playback Format

Use this menu to specify the playback mode. The unit can decode tapes recorded on other multiplexers. If a tape from a Dedicated Micros or Robot-compatible multiplexer is to be played back, the proper format must first be selected from the unit's menus. This setting can be found in the Playback Format menu.

<input checked="" type="checkbox"/> CBR+
<input type="checkbox"/> CBR
<input type="checkbox"/> SL/DM
<input type="checkbox"/> ROBOT

Operator Menu → Alarm History

This box lets opens a window listing up to 100 of the most recent alarm events. (The alarm history is kept in a cyclic buffer.)

Each entry includes:

- The event number.
- The event's date.
- The event's time (to the second).
- The camera number.

Use the **up/down arrows** to scroll through the list.

Alarm History Box	
001 - 02/04 18:40:32	16
002 - 02/15 12:00:10	11
003 - 02/28 10:10:45	08
	:
	:
010 - 03/15 05:12:16	04
[OK]	

Operator Menu → Operator Password

Use this box to change the Operator password.

Password Box	
Enter a new Operator Password	

[CANCEL]	[OK]

Operator Menu → Normal Record Speed

Selecting either Fields or Hours adjusts the other. Typically, the Hours setting is used. But, it may be necessary to use the Field setting with some VCRs. To set this option properly, see the VCR manufacturer's recommendations.

Normal Record Speed	
Fields	Hours
001	002

The System View Menu

Use this menu to examine the system's current operating parameters. This information is distributed among six screens, as shown in Table 3-1 and Table 3-2 (pages 3-11 and 3-12).

View Screen 1
View Screen 2
View Screen 3
View Screen 4
View Screen 5
View Screen 6
Exit

Table 3-1. The Six View Screens (Numerical Order)

View Screen	Information Displayed
1	Alarm Input: Enabled or disabled? N/O or N/C? Macro?
	Alarm Action: Freeze? Camera Relay Monitor
	External Action
2	Camera: Enabled or disabled? Signal gain Covert? Title
	Video loss action: Relay 1 Relay 2 Buzzer
3	Motion Detection: Enabled or disabled? Activity or intrusion? Sensitivity Record rate Rejection ratio Target size Alarm camera
4	Record List Salvo Switching List Buzzers Global? Live Alarm? Video loss? Playback
	Monitor displays of titles?
5	Monitor display: Time and date? Time and date formats
	Master clock use?
	Dwell times
	Record speeds
	Alarm latch
	Alarm record mode
	Fullscreen alarm?
	Fullscreen display (field or frame?)
	Salvo Switching
	Auto Disable?
6	Indicate detection?
	Baud rate
	Network address
	Playback format
	VCR signal
	VEXT pulse
	VEXT edge
	Factory settings
	Keyboard lock?
	Relay 1 (N/O or N/C?)
Relay 2 (N/O or N/C?)	

Table 3-2. The Six View Screens (Alphabetical Order)

Information Displayed	View Screen
Alarm Action: Freeze? Camera Relay Monitor	1
Alarm Input: Enabled or disabled? N/O or N/C? Macro?	
Alarm latch	5
Auto Disable?	
Baud rate	6
Camera: Enabled or disabled? Signal gain Covert? Title	2
Dwell times	5
External Action	1
Factory settings	6
Fullscreen alarm?	5
Fullscreen display (field or frame?)	
Indicate detection?	6
Keyboard lock?	
Master clock use?	5
Monitor display: Time and date? Time and date formats	
Monitor displays of titles?	4
Motion Detection: Enabled or disabled? Activity or intrusion? Sensitivity Record rate Rejection ratio Target size Alarm camera	3
Network address	6
Playback format	6
Record speeds	5
Record List Salvo Switching List Buzzers Global? Live Alarm? Video loss? Playback	4
Relay 1 (N/O or N/C?)	
Relay 2 (N/O or N/C?)	6
Salvo Switching	5
VCR signal	6
VEXT edge	
VEXT pulse	
Video loss action: Relay 1 Relay 2 Buzzer	2

4 OPERATOR PROGRAMMING

NOTE: For an explanation of the notation used in this chapter, see **A Word About Notation** on page 3-1.

4.1 Operator Menu → Field/Frame Display

With digital full-screen displays, the Field and Frame settings switch the resolution between field and frame displays. The lower resolution field displays result in less flickering on some high-contrast camera scenes. The default setting is **Frame**.

Field/Frame Setup	
Display :	Frame
[CANCEL]	[OK]

NOTE: This is a global system setting, and affects all cameras.

A symbol appears next to the time/date of Camera 1 when called to full-screen display. Field resolution appears as a hyphen (–) when Camera 1 is selected. Frame Resolution displays no hyphen when selected.

4.2 Operator Menu → Sequencing

Use this menu to specify:

- Multiscreen dwell time (used for the sequencing cameos in the multiscreen mode).
- Live full-screen dwell times (used when the **SEQUENCE** key is pressed).
- Play full-screen dwell times (used when the **SEQUENCE** key is pressed).
- Whether or not Salvo Switching is to be enabled; The order in which camera groups are to be displayed.

Multiscreen Dwell
Live Full Dwell
Play Full Dwell
Salvo Switching
Exit


The camera sequence list is programmed through the AutoList feature.

See **Installer Programming**, page 5-1.


The full-screen dwell time is the same for all monitors in the Live mode. Dwell time settings determine the time interval between displays for each camera in the sequence list.

NOTE: The camera sequence lists for all monitors are programmed using the AutoList feature. See **AutoList and Sequencing**, page 2-13.

Starting Full-Screen Sequencing on Any Monitor

	<p>After making sure that the desired camera is selected for control, select any full-screen display by pressing the camera number, and then press the SEQUENCE key.</p>
---	--

Canceling Full-Screen Sequencing on Any Monitor

	<p>After making sure that the desired camera is selected for control, press either the SEQUENCE key (again), or any camera number key.</p>
---	--

Operator Menu → Sequencing → Multiscreen Dwell

Use this box to set the Multiscreen Dwell time in seconds. The range is from 1 through 250, with a default value of 3. Similar boxes appear for **Live Full Dwell** and **Play Full Dwell**.

Multiscreen Dwell
(Time in Seconds)
002

Operator Menu → Sequencing → Salvo Switching

Use this menu to specify:

- Whether or not Salvo Switching is to be enabled.
- The order in which camera groups are to be displayed.

Salvo Enable
Salvo Setup
Exit

Operator Menu → Sequencing → Salvo Switching → Salvo Enable

This menu enables or disables Salvo Switching.

Salvo Switching
Enable : YES
[CANCEL] [OK]

Operator Menu → Sequencing → Salvo Switching → Salvo Setup

Use this menu to program the order in which camera groups are displayed in Salvo Switching.

Camera groups are programmed by the installer. See **Installer Programming**, page 5-1.

Salvo Switching Setup
Index : 01
Group : 02
[CANCEL] [OK]

4.3 Operator Menu → Time/Date Display

Use this box to specify which monitors (if any) display the time and date.

Time and Date Display	
Monitor A :	<input checked="" type="checkbox"/> ON
Monitor B :	<input type="checkbox"/> ON
Monitor C :	<input type="checkbox"/> ON
Monitor D :	<input type="checkbox"/> ON
Monitor E :	<input type="checkbox"/> ON
[CANCEL]	[OK]

4.4 Operator Menu → Title Display

Use this box to specify which monitors (if any) display camera titles.

Titles Display	
Monitor A :	<input checked="" type="checkbox"/> ON
Monitor B :	<input type="checkbox"/> ON
Monitor C :	<input type="checkbox"/> ON
Monitor D :	<input type="checkbox"/> ON
Monitor E :	<input type="checkbox"/> ON
[CANCEL]	[OK]

4.5 Operator Menu → Playback Format

Use this menu to specify the playback mode. The unit can decode tapes recorded on other multiplexers. If a tape from a Dedicated Micros or Robot-compatible multiplexer is to be played back, the proper format must first be selected from the unit's menus. This setting can be found in the Playback Format menu.

<input checked="" type="radio"/> CBR+
<input type="radio"/> CBR
<input type="radio"/> SL/DM
<input type="radio"/> ROBOT

Meanings of Abbreviations:

- **CBR+** Calibur Plus (default setting)
- **CBR** Calibur
- **SL/DM** Calibur Lite; Dedicated Micros
- **ROBOT** Robot


NOTE: If a decoding format other than CBR+ is selected, *CALIBUR* tapes will not be properly decoded.

Tapes that Can Not be Decoded

If the unit can not decode a tape being played back, the system displays a blank screen. The fields are not decoded or separated. Two possible reasons why a tape can not be decoded are:

- The tape was not recorded on a multiplexer.
- The tape is not compatible with the decoding format selected in programming.

If the tape was actually recorded on a *CALIBUR*-compatible multiplexer, a Dedicated Micros unit, or Robot unit, check to see that the correct **PLAYBACK** format has been selected in the menus.

	<p>Use the FUNCTION and PLAY to view the VCR output when nothing is being decoded.</p>
---	--

4.6 Operator Menu → Alarm History

This box lets opens a window listing up to 100 of the most recent alarm events. (The alarm history is kept in a cyclic buffer.)

Each entry includes:

- The event number.
- The event's date.
- The event's time (to the second).
- The camera number.

Use the **up/down arrows** to scroll through the list.

Alarm History Box			
001	-	02/04 18:40:32	16
002	-	02/15 12:00:10	11
003	-	02/28 10:10:45	08
		:	
		:	
010	-	03/15 05:12:16	04
[OK]			

4.7 Operator Menu → Operator Password

The following steps illustrate changing the Operator Password. See **Main Menu → Passwords**, page 5-44, for information on changing the Installer password.

Enter the new password. Highlight **[OK]**, and press the **ENTER** key confirm it.

To leave the password unchanged, use **[CANCEL]**.

Password Box	
Enter a new Operator Password ----- [CANCEL] [OK]	

When you have entered a new password, a confirmation box is displayed where you must enter the same password again. Again use **[OK]** or **[CANCEL]** to complete this operation.

Confirmation Box	
Please re-enter the Password ----- [CANCEL] [OK]	

If you select [OK] in the previous box, this message appears.

If you select [CANCEL] instead, the message reads:

The Password was NOT changed!



4.8 Operator Menu → Normal Record Speed

Unless VEXT (VCR sync pulse) is used for Normal and Alarm recording, the unit must be programmed with the same record speeds as the VCR.

Dual-speed time-lapse VCRs allow two different recording speeds during Normal operation and Alarm situations. The Alarm recording speed is usually the recorder's fastest speed setting: 2-hour for NTSC/EIA, and 3-hour for PAL/CCIR.

Normal time-lapse recording typically runs at a slower speed, such as 12-hour or 48-hour, resulting in tape savings while no alarm events are occurring.

The Normal Record Speed can be programmed in the Operator Menu. The factory default setting is 2-hour for NTSC/EIA (3-hour for PAL/CCIR).

Selecting either Fields or Hours adjusts the other. Typically, the Hours setting is used. But, it may be necessary to use the Field setting with some VCRs. To set this option properly, see the VCR manufacturer's recommendations.

Normal Record Speed	
Fields	Hours
001	002

NOTE: The **Fields** value is the number of fields that each camera in the Record List sends through the VCR output.

For most time-lapse VCRs, the **Fields** value corresponds to the record duration as follows:

Fields Value	Record Value	
	NTSC (hours)	PAL (hours)
001	2	3
003	6	6
005	8	12
007	12	18
009	16	24
011	20	30
013	24	36

For high-density or quasi-real-time VCRs, use the field value recommended in the VCR manufacturer's manual.

The unit displays a code indicating the recording speed on Monitor A, the same code used by time-lapse VCRs. For example, **R024** appears when the unit is recording in 24-hour mode. (If the VCR switch input is active, then **REXT** appears.)

VCR Playback Speed

The playback speed must be selected at the VCR, not at the unit. The multiplexer automatically matches the VCR playback speed.

The letter **P** appears on-screen to indicate the Play mode. The speed at which the information was recorded follows the **P**. For example, **P024** indicates the 24-hour recording speed (not the playback speed).

To find out the playback speed, look at the VCR's playback speed display. If the recording was made using the camera switch **VEXT** input, then the mode and speed symbols read **PEXT** in Play mode.

NOTE: The time and date displayed on-screen during Play mode are the recorded time, not the current system time and date.

The letter **V** appears if there was video loss during the recording.

The abbreviation **N/A** appears on-screen if a camera is not detected on tape for several consecutive cycles during playback. If the camera is not flagged as a video-loss camera, an **N/A** message appears indicating not available.

This abbreviation helps to distinguish between:

- Images not being updated during playback.
- Images being updated from tape that contain no movement.

If an alarm occurred during recording, the letter **A** appears with the image on Monitor A.

5 INSTALLER PROGRAMMING

NOTE: For an explanation of the notation used in this chapter, see **A Word About Notation** on page 3-1.

5.1 Main Menu → Time/Date

Use this menu to specify:

- Which monitors (if any) are to display the time and date.
- What time and date formatting to use.
- The time and date.
- Whether the unit is a master or a slave.

There can be only one master unit. It transmits time and date information on the RS-485 line. Slave units receive this information.

```

Time/Date Display
Set Time Format
Set Date Format
Set Time
Set Date
Set Master/Slave
Exit

```

Main Menu → Time/Date → Time/Date Display

Use this box to specify which monitors (if any) are to display the time and date.

```

Time/Date Display
Monitor A : ON
Monitor B : ON
Monitor C : ON
Monitor D : ON
Monitor E : ON
[CANCEL]   [OK]

```

Main Menu → Time/Date → Set Time Format

Time format is either a 12-hour or 24-hour clock.

```

Time Format Setup

Select Format
24 HOUR

```

Main Menu → Time/Date → Set Date Format

Date format can be DD/MM/YY, MM/DD/YY, or YY/MM/DD.

```

Date Format Setup

Select Format
MM/DD/YY

```

Main Menu → Time/Date → Set Time

Set the time as follows.

1. Press the **ENTER** key. The highlighting moves to the row of numbers.
2. Enter the proper numerals for **HH**, **MM**, and **SS**. Use the **left/right arrow** keys to move among the three fields. Use the **up/down arrow** keys to change the numbers themselves.
3. When finished, press the **ENTER** key again.
4. Use the **arrow** keys to select **[OK]**.
5. Press the **ENTER** key again to confirm and exit.

Time Setup	
HH	MM SS
12	13 30
[CANCEL]	[OK]

Main Menu → Time/Date → Set Date

Set the date as follows.

1. Press the **ENTER** key. The highlighting moves to the row of numbers.
2. Enter the proper numerals for **MM**, **DD**, **YY**, and **Day**. Use the **left/right arrow** keys to move among the three fields. Use the **up/down arrow** keys to change the numbers themselves.
3. When finished, press the **ENTER** key again. Use the **arrow** keys to go to **[OK]**.
4. Press the **ENTER** key again to confirm and exit.

Date Setup			
MM	DD	YY	Day
12	13	99	2
[CANCEL]	[OK]		

NOTE:

The day of the week is specified by a number from 1 through 7. Day 1 of the week varies with geographic location and local custom.

For example, if Sunday is day 1 and today is Wednesday, enter 4 as the Day value.

This setting ensures that a scheduled macro (timed macro) is run on the correct day of the week.

Main Menu → Time/Date → Set Master/Slave

Master/slave selection can be used to set one particular multiplexer (of several in an installation) as a master clock. If this is done, the time changes and daylight savings time need to be changed on the master unit only.

The master clock controls the time and date display for the other multiplexers in the RS-485 network. For master/slave selection to function properly, each multiplexer in the network must be separately set up through the menu.

Master/Slave Select	
Master Clock :	NO
[CANCEL]	[OK]

NOTE:

There can be only one master clock. The rest must be slaves.

5.2 Main Menu → Sequencing

Use this menu to specify:

- Multiscreen dwell time (used for the sequencing cameos in the multiscreen mode).
- Live full-screen dwell times (used when the **SEQUENCE** key is pressed).
- Play full-screen dwell times (used when the **SEQUENCE** key is pressed).
- How groups of cameras switch simultaneously on Monitors B through E.

Multiscreen Dwell
Live Full Dwell
Play Full Dwell
Salvo Switching
Exit

The camera sequence list is programmed through the AutoList feature.

The full-screen dwell time is the same for both all monitors in Live and Play modes. Dwell time settings determine the time between each camera in the sequence list.

NOTE: The camera sequence list for all monitors are programmed using the AutoList feature. See **AutoList and Sequencing**, page 2-13.

Main Menu → Sequencing → Multiscreen Dwell

Use this box to set the Multiscreen Dwell time in seconds. The range is from 1 through 250, with a default value of 3.

Similar boxes appear for **Live Full Dwell** and **Play Full Dwell**.

Multiscreen Dwell
(Time in Seconds)
002

Main Menu → Sequencing → Salvo Switching

Use this menu to specify:

- Whether or not Salvo Switching is to be enabled.
- The order in which camera groups are to be displayed.

Salvo Enable
Salvo Setup
Exit

Main Menu → Sequencing → Salvo Switching → Salvo Enable

This menu enables or disables Salvo Switching.

Salvo Switching
Enable : YES
[CANCEL] [OK]

Main Menu → Sequencing → Salvo Switching → Salvo Setup

Use this menu to program the order in which camera groups are displayed in Salvo Switching.

Camera groups are programmed by the installer. See **Installer Programming**, page 5-1.

Salvo Switching Setup
Index : 01
Group : 02
[CANCEL] [OK]

5.3 Main Menu → Record

Use this menu to specify:

- The order in which images are to be recorded from the different camera inputs. Use this selection to increase the update rate of more important cameras.
- Normal recording speed.
- Alarm recording speed (typically 2-hour for NTSC/EIA, 3-hour for PAL/CCIR).

Record List
Normal Record Speed
Alarm Record Speed
Exit

The Record List is used to set the record order of camera output signals. Up to thirty cameras can be selected in any order. This allows the same camera number to be repeated in the list as required to increase the update rate or camera priority on the VCR.

Also, in this menu, set the normal record speed for the VCR (time-lapse speed), the alarm record speed (2-hour for NTSC/EIA, 3-hour for PAL/CCIR).

Main Menu → Record → Record List

A programmed Record List controls the sequence of single fields from each camera sent to the VCR. The list can contain any camera more than once. For example, if the list is set to:

1 2 3 3 4 5 6 7 8 5 _

Then, among the fields recorded will be:

- Three consecutive and unique fields from Camera 3.
- Two non-consecutive fields from Camera 5.

For a multiplexer, the programming for Camera 5 is the preferred way to repeat a camera because it results in evenly spaced updates.

Repeat a camera only if it has priority over other cameras in the list.

A blank entry ends the list. For example, the list:

1 2 3 _ 5 6 7 8

records only cameras 1, 2, and 3, the blank after the 3 ends the Record List.

Record List
Index : 01
Camera : 01
[CANCEL] [OK]

Automatic Modification of the Record List

The unit modifies the Record List in the case of video loss alarms or activity detection, according to the parameters set up by the user in the Alarm and Motion Detection menus. For example, if Interleaved recording on alarm is selected, a single camera in alarm is recorded in virtual real time.

NOTE: If alarms and activity detection occur at the same time, the alarm modifications to the Record List take precedence and cancel all modifications made to the Record List by activity detection. The unit does not control the setup of the VCR itself. The installer must ensure that the VCR is properly programmed and has correctly connected alarm inputs.

Main Menu → Record → Normal Record Speed

Main Menu → Record → Alarm Record Speed

Unless **VEXT** (VCR sync pulse) is used for NORMAL and ALARM recording, the unit must be programmed with the same record speeds as VCR.

Dual-speed time-lapse VCRs allow two different recording speeds during NORMAL operation and ALARM situations. The ALARM recording speed is usually the recorder's fastest speed setting: 2-hour for NTSC/EIA, and 3-hour for PAL/CCIR.

Normal time-lapse recording typically runs at a slower speed, such as 12-hour or 48-hour, resulting in tape savings while no alarm events are occurring.

The normal Record Speed can also be programmed in the Operator Menu. The factory default setting is 2-hour for NTSC/EIA, (3-hour for PAL/CCIR).

Normal Record Speed		Alarm Record Speed	
Fields	Hours	Fields	Hours
001	002	001	002

NOTE: The **Fields** value is the number of fields that each camera in the Record List sends through the VCR output.

For most time-lapse VCRs, the **Fields** value corresponds to the record duration as follows:

Fields Value	Record Value	
	NTSC (hours)	PAL (hours)
001	2	3
003	6	6
005	8	12
007	12	18
009	16	24
011	20	30
013	24	36

For high-density or quasi-real-time VCRs, use the field value recommended in the VCR manufacturer's manual.

Selecting either Fields or Hours adjusts the other. Typically, the Hours setting is used. But, it may be necessary to use the Field setting with some VCRs. To set this option properly, see the VCR manufacturer's recommendations.

The unit displays a code indicating the recording speed on Monitor A, the same code used by time-lapse VCRs. For example, **R024** appears when the unit is recording in 24-hour mode. (If the VCR switch input is active, then **REXT** appears.)

5.4 Main Menu → Alarms

The standard unit is equipped with one alarm input per camera output, each associated with its Live video input. An alarm input displays an on-screen warning on all monitors, flashes a front panel LED, sounds an internal buzzer, and changes Record List priority.

Use this menu to specify:

- Whether the alarm input for each camera is N/O or N/C.
- Whether the alarms are Latched, Transparent, or Timed-Out.
- How to display associated cameras;
What action to take when an alarm is received;
How to set up a Salvo Switching group.
- External alarm action (for future use, not yet implemented).
- How the images from the alarmed cameras are to be recorded (Interleaved, Exclusive or, No Change).
- Whether some or all of the alarms are to be enabled or disabled.
- Viewing of the history for the last 100 alarms.
- Which macro runs when an alarm is received.
- Alarms are to be displayed in full-screen mode only.
- Whether the alarm output relays are N/O or N/C.
- What activates the buzzer.
- What action is taken when video loss occurs.

Input Configuration
Alarm Latch
Alarm Action
External Alarm Action
Record Mode
Enable/Disable
Alarm History
Link to a Macro
Fullscreen Alarm
Relay Configuration
Buzzer Setup
Video loss Action
Exit

Alarms trigger on-screen displays of a flashing letter **A** in each corresponding cameo on multiscreen. The symbol is **ALM** on:

- Any full-screen display.
- Any display of cameras in alarm on Monitors B through E.

Main Menu → Alarms → Input Configuration

The alarm inputs are configured as zero potential relay contacts, individually programmable as normally open (N/O) or normally closed (N/C). To set the alarm input configuration to N/O or N/C, use the Input Configuration section of the Alarm menu (shown below). The factory default is **N/OPEN**.

Alarm Input	
Alarm 01:	N/OPEN
Alarm 02:	N/CLOSED
Alarm 03:	N/OPEN
Alarm 04:	N/OPEN
Alarm 05:	N/OPEN
Alarm 06:	N/CLOSED
Alarm 07:	N/OPEN
	:
	:
	:
Alarm 16:	N/OPEN
	↓↓↓
[CANCEL]	[OK]

NOTE:

In this menu, as in some others, a set of three arrows appears:

↓↓↓

These arrows mean that the entire list is too long for the available display area.

To see the next group of selections, highlight the arrows, and then press the **ENTER** key.

Main Menu → Alarms → Alarm Latch

Alarm latching determines how the unit responds to alarm inputs.

Latched
Transparent
Timed Out

There are three types of alarm latching, as shown in Table 5-1.

Table 5-1. The Three Types of Latching

Type	Description
Latched	Alarms are latched until silenced and acknowledged. A new input restarts the alarm.
Timed Out	<p>Timed-out alarms are latched for a preset period from the start of alarm activation. When the preset interval times out, the alarm is silenced and acknowledged. The time-out period is a programmable selection in the menu.</p> <p>If an alarm input is still active after the time-out, the alarm LED remains on.</p> <p>If an alarm ceases and restarts before the time-out period ends, the time-out period starts over.</p> <p>Timed-out alarms can be silenced and acknowledged at any time. Like latched alarms, if the alarm is canceled, it is silenced and acknowledged, and does not reactivate until new input occurs.</p>
Transparent (not Latched or Timed)	Alarms are active only while the alarm input is active. As soon as the alarm-input ceases, the alarm is silenced and acknowledged.

Main Menu → Alarms → Alarm Latch → Timed Out

Use this box to set the time-out interval in seconds. The range is from 1 through 250.

Alarm Timeout
(Time in Seconds)
020

NOTES:

A Transparent alarm can not be silenced or acknowledged. It remains active as long as the corresponding alarm input is active.

If the ability to silence or acknowledge active alarms is desired and Transparent mode is preferred, select Timed Out alarms in the Alarm Latching menu, and set the time-out period to two seconds.

Main Menu → Alarms → Alarm Action

See the discussion below.

Alarm Action Setup	
Input (Group):	01
Freeze	: YES
Cameras	: 16 01 02 03
Presets	: -- -- -- --
Relay	: 1
Aux Monitor	: B
[CANCEL] [OK]	

Alarm Action

For each alarm input, there is a primary **camera in alarm**. But, when an alarm is received, four cameras (including the camera in alarm) are displayed. These four are called **associated cameras**, and they constitute a **group**. Each group is designated by the number of the alarm input itself (from 1 through 16).

Factory Defaults

1. For alarm input number N, the camera in alarm is Camera N. This is normally the first camera displayed in the **Alarm Action Setup** box.
2. The other three associated cameras in the group are:
 - The camera numerically ahead of the alarmed camera.
 - The two cameras numerically following it.

If any associated camera numbers are out of range, the selection "wraps around" accordingly.

EXAMPLES: 1) For alarm input 6, the camera in alarm is Camera 6. The group of associated cameras consists of Cameras 5 through 8, which are displayed in this order:

6 5 7 8

2) For alarm input 1, the camera in alarm is Camera 1. The associated cameras are (in the order displayed):

1 16 2 3 for a 16-channel unit

1 32 2 3 for a 32-channel unit

3) For alarm input 16, the camera in alarm is Camera 16. The associated cameras are (in the order displayed):

16 15 1 2 for a 16-channel unit

16 15 17 18 for a 32-channel unit

User Options

The factory defaults are changeable by the programmer, who can select the cameras constituting each group.

NOTE: The cameras in a group should be selected to provide the best coverage for a given alarmed area.

In addition:

- Each alarm input can be programmed to activate either one or both of the Alarm Output Relays.
- The unit can be programmed to freeze the camera-in-alarm at the instant of alarm.

Presets

Cameras equipped with telemetry capabilities can be programmed to a preset view in an alarm situation. These presets are programmed in the camera controls, not in the multiplexer. Calibur units support Presets 1 through 16. Telemetry-equipped cameras may have more or fewer.

In this box:

- Camera 16 is programmed to Preset 2.
- Camera 1 is programmed to Preset 1.
- The remaining two cameras are not programmed.

Note that the double hyphen (--) symbol signifies that no presets have been programmed (or that the camera is not telemetry-equipped). This is the factory default for all cameras.

Alarm Action Setup	
Input (Group):	01
Freeze	: YES
Cameras	: 16 01 02 03
Presets	: 02 01 -- --
Relay	: 1
Aux Monitor	: B
	[CANCEL] [OK]

After entering the appropriate Preset value for each programmed camera, select [OK] to close the box and store the information.

Freezing Alarms on Monitor A in Live Mode

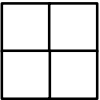
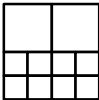
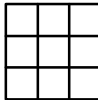
The programmer can choose to have the camera in alarm frozen at the instant of the alarm by selecting YES in the menu. The factory default for all alarm inputs is that the camera in alarm is frozen when the alarm input is received.

NOTE: If an additional alarm is received while some cameras are already frozen:
The frozen cameras become unfrozen and immediately re-frozen at the instant the new alarm input is received.

The associated cameras are not frozen at the instant of alarm. This allows the programmer to freeze the instant of alarm while continuing to track ongoing activity on the same screen.

APPLICATION NOTE: If one of the associated cameras is the same as the camera in alarm:
A frozen image of the camera in alarm, as well as a Live image of the same camera, appear on Monitor A at the same time.
This approach is not needed if Monitors B through E are installed.

Depending on the number of simultaneous alarm inputs, the multiplexer selects a customized alarm display. This display shows all cameras in alarm, as well as the associated cameras. The custom screens are automatic for up to three simultaneous alarms.

	First Alarm	Second Alarm	Third Alarm
			
Cameras in alarm	Top left cameo.	Top two cameos.	Top three cameos.
Associated cameras	The remaining cameos.	Three of the four cameos below each top cameo.	The remaining cameos.

NOTE: The custom alarm screens on Monitor A are displayed only while an alarm is active. Once an alarm times out or is cleared, the display reverts to the previous screen. It is very important to select the best alarm-latching mode for alarm displays.

Displays for More than Three Simultaneous Alarms

If more than three alarms are active at the same time, the unit selects a display format showing all the cameras in alarm. Associated cameras are not selected for display, nor are alarms frozen.

Usually, this is a 9-way display, unless more than nine cameras are in alarm at the same time. As each new alarm is received, the unit adjusts the display.

Full-Screen Displays on Monitors B through E During Alarms

Salvo Switching Disabled

During alarms, the monitor (B through E) designated as Aux Monitor in the menu switches to a full-screen display of the camera in alarm. The other monitors continue to display their current cameras and not change due to alarm.

If multiple alarms are active, the designated Aux Monitor sequences among the alarm cameras at a fixed 1-second dwell, which is not programmable. Monitors B through E cannot freeze images on alarm.

Salvo Switching Enabled

During alarms, the Aux Monitor setting has no effect. Monitors B through E switches to a full-screen display of the cameras programmed as the Input Group in the Alarm Action Setup menu.

For example, if input alarm 01 is activated, Group 01 cameras display on Monitors B through E.

If multiple alarms are active, Monitors B through E sequence between the alarm camera Groups at a fixed 1-second dwell. This dwell is not programmable. Monitors B through E cannot freeze images on alarm.

NOTE: The Monitors B through E screens do not revert to original fixed displays after the alarm is cleared. They continue to display the last alarm camera. But, if sequencing was active on Monitors B through E before the alarm, then Monitors B through E continue to sequence after the alarm is cleared.

If the user changes the screen format while an alarm is active, then the unit continues to display the selection after the alarm clears. It does not revert to the pre-alarm screen display.

Main Menu → Alarms → External Alarm Action [Remote Alarms]

This feature is for future development, and has not yet been implemented.

External Alarm Action	
Remote Input	: 01
Output	: NONE
[CANCEL]	[OK]

Main Menu → Alarms → Record Mode

Use this menu to select among No Change recording, Exclusive recording, or Interleaved recording as the response to an alarm. The latter two modes always result in a faster update to tape of a camera in alarm.

This is a global system setting, and all cameras in alarm are recorded using this method.

Alarm Record Mode
Select Mode
INTERLEAVED

Table 5-2. The Three Record Modes

Mode	Description
No Change	In this mode, recording during alarms means no that priority recording exists for the cameras in alarm, and the Record List remains unchanged during alarms. But, the user can still program the VCR and the unit to switch from a time-lapse speed to a faster recording speed during alarms, ensuring alarm events a faster update speed.
Exclusive	In this mode, the system records only alarmed cameras. All non-alarmed cameras are omitted from the Record List during an alarm. Exclusive recording mode is chosen when several simultaneous alarms are expected to occur often, and a near real-time record of those alarm events is required. The disadvantage is that other cameras are not recorded during an alarm. If Exclusive alarm recording is selected, the alarm input sensors must be very sensitive and reliable, so that alarm events are not missed, and the system does not initiate exclusive alarm mode recordings for false alarms.
Interleaved	In this mode, both the alarmed cameras and non-alarmed cameras are recorded. Alarmed cameras have a higher priority and are interleaved between non-alarmed cameras. The Interleaved mode offers increased recording of cameras in alarm, without stopping the recording of other cameras. This is the mode recommended for most installations.

EXAMPLE:	Non-alarmed cameras: 1,2,3,5,7	INTERLEAVED recording sequence:
	Cameras in alarm: 4,6	1,4,6,2,4,6,3,4,6,5,4,6,7,4,6,1, . . .

NOTE: In general, Interleaved recording provides quick updates of cameras in alarm (including multiple alarms.) Interleaved mode is the recommended setting.

Main Menu → Alarms → Enable/Disable

This selection offers three options:

- **Individual Enable:** Allows individual alarms to be enabled or disabled.
- **Enable All:** Globally enables all alarm inputs.
- **Disable All:** Globally disables all alarm inputs.

Individual Enable
Enable All
Disable All
Exit

Main Menu → Alarms → Enable/Disable → Individual Enable

Selecting **Individual Enable** in the previous menu opens this menu. Each camera can be individually enabled or disabled.

Alarms Enable	
Alarm 01:	ENABLE
Alarm 02:	DISABLE
Alarm 03:	ENABLE
Alarm 04:	ENABLE
Alarm 05:	ENABLE
Alarm 06:	DISABLE
Alarm 07:	ENABLE
:	
:	
:	
Alarm 16:	ENABLE
↓↓↓	
[CANCEL]	[OK]

Main Menu → Alarms → Alarm History

This box lets opens a window listing up to 100 of the most recent alarm events. (The alarm history is kept in a cyclic buffer.)

Each entry includes:

- The event number.
- The event's date.
- The event's time (to the second).
- The camera number.

Use the **up/down arrows** keys to scroll through the list.

Alarm History Box				
001	-	02/04	18:40:32	16
002	-	02/15	12:00:10	11
003	-	02/28	10:10:45	08
			:	
			:	
010	-	03/15	05:12:16	04
[OK]				

Main Menu → Alarms → Link to a Macro

An alarm input (or several inputs) can be linked to any macro function. This can start a pre-programmed sequence of keystrokes each time an alarm occurs.

Macro Link List Setup	
Alarm	: 01
Macro	:
[CANCEL] [OK]	

NOTE: The system always completes other normal alarm actions before executing the macro function.

Main Menu → Alarms → Fullscreen Alarm

See the discussion below.

Fullscreen Alarm	
Fullscreen (Mon A):	NO
[CANCEL] [OK]	

Full-Screen Alarm

If the programmer does not install Monitors B through E and relies solely on Monitor A for all system information, a full-screen alarm display on Monitor A may be preferred to the custom multiscreen displays.

In this case, the programmer can select a menu option in the Alarms menu that makes Monitor A:

- Switch to a full-screen display of the camera in alarm.
- Sequence full-screen between multiple alarms (as Monitors B through E normally do).

The custom alarm screens do not appear. (This is a global setting for all cameras).

If the option was selected in the Alarm Action menu, a single full-screen alarm is not frozen.

Main Menu → Alarms → Relay Configuration

This box allows each relay to be configured as N/OPEN (normally open, N/O) or N/CLOSED (normally closed, N/C).

Relay Configuration	
Relay 1:	N/OPEN
Relay 2:	N/CLOSED
[CANCEL]	[OK]

Factory default settings for Alarm Output Relays are:

All Alarm Inputs activate Relay 1

All Motion Detection activates Relay 2

Main Menu → Alarms → Buzzer Setup

The internal buzzer can be programmed to respond under various conditions.

Turn this buzzer OFF:	If buzzer response is not desired:
Live Alarm	On incoming Live alarms
Video loss	On video loss detection
Playback	During playback of videotapes where alarms are present
Global	All of the above

Buzzer Setup	
Global Buzzer	: ON
Live Alarm Buzzer	: ON
Video Loss Buzzer	: ON
Playback Buzzer	: ON
[CANCEL]	[OK]

Main Menu → Alarms → Video loss Action

This box specifies what happens when there is loss of video input. Video loss can occur due to a failed camera or disconnection of the video signal to the multiplexer.

Video loss Action	
Camera	: 01
Relay 1	: DISABLE
Relay 2	: DISABLE
Buzzer	: DISABLE
[CANCEL]	[OK]

Indications

- Multiscreen displays: The letter **V** appears on-screen in each affected cameo.
- Full-screen displays: The abbreviation **VDL** appears on-screen when the affected camera is displayed.
- An LED below the ALARM key blinks.
- A buzzer sounds. (This is programmable.)

Table 5-3. Video Loss Action in Live Mode

Monitor	Action
A	If a camera is being displayed while video loss occurs, the camera image freezes. But, if sequencing is in progress, the display blanks when switched to a camera experiencing video loss.
B through E	Display goes blank when a camera with video loss is selected.

Video Loss Action in Record Mode

When video loss is detected, the affected camera is temporarily removed from the Record List, and the video loss information is recorded. This video loss status is displayed during playback. The unit continues to monitor video loss cameras, and displays the cameras when video signal is restored.

NOTE: The unit allows the user to disable cameras that are not connected or are out of service for an extended time. In this way, unnecessary video loss messages can be avoided.


See **Main Menu** → **Camera Setup** → **Camera Disable**, page 5-35.

5.5 Main Menu → Macro

Use this menu to:

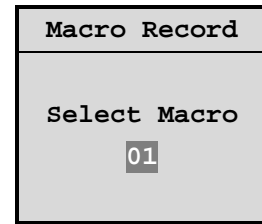
- Initiate macro recording (and specify which macro is to be recorded).
- Specify the parameters and schedules governing automatic macro execution.
- Initiate submacro editing (and specify which submacro is to be edited).
- Activate automatic transmission of the Play and Record submacros to the VCR.

Macro Record
Timed Macro Start
Edit Submacro
PLAY/RECORD Link
Exit

	<p>Macro Functions provide for recording of frequently used key sequences and menu setups as two-keystroke operations. The FUNCTION key plus the macro number (1 through 16) begins execution. Pressing the FUNCTION key cancels a macro.</p>
---	--

Main Menu → Macro → Macro Record

Select the macro's number.



To begin recording, select Macro Record in the Macro menu, and then select one of the macros by number (1 through 16). Upon selection, the system exits the menus and goes to a **reference point** (starting point), from which all subsequent keystrokes are recorded into that macro.

NOTE: The letter **F** and the macro number appear on the screen while macro recording is active.

	<p>Each keystroke is recorded, until the FUNCTION and ENTER keys are pressed (in that order) to end the macro recording, or until 32 keystrokes have been entered.</p>
	<p>Each use of the MENU key counts as one keystroke in the macro. If the menus are accessed during macro recording, the keystrokes are canceled. Instead of recording keystrokes while in the menus, this process records only the final settings of all setup parameters for those menus.</p>

Special Keys Functions During Macro Record

The following two-key combinations allow special actions within macros:

<p>FUNCTION, then 1.</p>	<p>Activate output relay 1.</p>
<p>FUNCTION, then 2.</p>	<p>Reset output relay 1.</p>
<p>FUNCTION, then 3.</p>	<p>PAUSE macro, 1 second.</p>
<p>FUNCTION, then 4.</p>	<p>PAUSE macro, 5 seconds.</p>
<p>FUNCTION, then 5.</p>	<p>Activate output relay 2.</p>
<p>FUNCTION, then 6.</p>	<p>Reset output relay 2.</p>
<p>FUNCTION, then ENTER .</p>	<p>End macro recording.</p>

When running a macro, the unit retrieves only the recorded menu setup parameters, and sets up the unit accordingly. Parameters in menus not accessed during macro recording are not recorded or retrieved during playback.

New menu setups can run manually, automatically by time and day, or when activated by an alarm. See **Main Menu** → **Macro** → **Timed Macro Start** (page 5-19), or **Main Menu** → **Alarms** → **Link to a Macro** (page 5-14).

Typical uses of this unique macro feature are:

- Different display screens.
- Different sequence tables.
- Different recording modes or playback format.
- Disable or Enable Cameras, Alarms and Motion Detection.

Macro Limitations

Alarms and motion detection can only be enabled and disabled by means of macros. Other alarm and motion detection parameters can not be set with macros

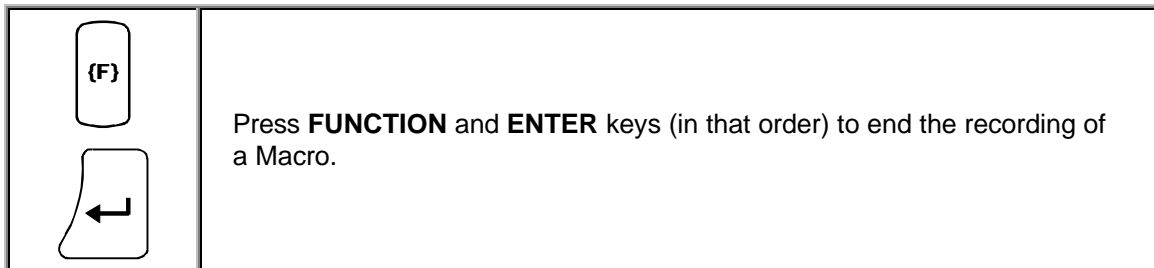
The following parameters can not be set up with a macro, and should be set up during installation:

- Output Relay selection: 1, 2 (or both) per input.
- Alarm inputs and Output Relays contact configuration: N/O or N/C.
- Whether the **M** indicator is on or off during motion detection.
- Video loss relays and buzzer selections per input.
- VCR switch pulse edge selection.
- Alarm action parameters.

NOTE:

Because of extensive memory requirements, some parameters (such as motion detection grids) can not be changed with a macro function. But, they can be set up through the RS-232 port.

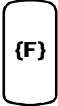
Ending Macro Recording



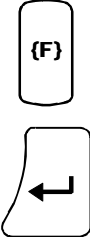
RECOMMENDATION:

Make a list of each macro function and its number for later reference. See Section 9.


Editing a Macro

	<p>There is no macro editing capability. To check a macro function, run the macro by pressing the FUNCTION key and the macro number, and check for correct operation. If the macro does not function properly, delete the macro as described below, and re-enter it.</p>
---	--

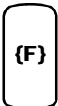
Deleting a Macro

	<p>Delete a macro by recording an empty macro over it. To record an empty macro, start macro recording from the Macro Record menu and immediately press the FUNCTION and ENTER keys to end the recording.</p>
---	---

Running a Macro

	<p>A macro can be played by pressing the FUNCTION key followed by the macro number (1 through 16). While the macro is running, the letter F and the macro number appear on Monitor A.</p>
--	--

Canceling a Macro

	<p>A macro can be canceled during its playback by pressing the FUNCTION key.</p>
---	---

Main Menu → Macro → Timed Macro Start

Macros can be preset to run at a fixed time and day of the week by using Timed Macro Start. This menu allows programming of up to 20 events that run automatically.

Scheduled events can be preset to start at any time and day or at a preset time every day. Any macro can be started by each of 20 scheduled events or by multiple events.

Timed Macro Setup	
Event	: 01
Day	: 00
Time	: 00:00
Macro	: 01
[CANCEL]	[OK]

Macro Timed-Start Setup Parameters

- Event:** Numbered from 1 through 20 for scheduled events.
- Day:** Select the day of the week by number (1 through 7) to start a macro. (The day of the week corresponding to today's date is programmed in the Date Setup menu.) If the macro is to run every day at the same time, select

* *

for the Day field. If a zero is entered for the day, the scheduled event entry is canceled and does not start the macro.
- Time:** Select the time to run the macro function.
- Macro:** Enter the number of the desired macro.

Keep a record of scheduled events for easy reference. A form is provided in Section 8.




NOTE: It is recommended that only experienced installers attempt to program RS-232 bytes for submacros. Please contact technical support for further information or assistance.



5.6 Main Menu → Macro → Edit Submacro

Macros generate RS-232 commands that can communicate with other RS-232 devices. Submacros are programmed within a macro.

A submacro transmits a programmed string of bytes from the RS-232 port of the multiplexer. Its purpose is to communicate with other RS-232 devices, such as VCRs. This permits RS-232 control of VCR functions.

The use of submacros increases the flexibility of the multiplexer by enabling the transmission of an RS-232 message when a macro is activated. Macros can be timed, linked to alarms, or manually activated from the front panel or keyboard. A submacro programmed into a macro runs along with the keystrokes recorded in a stored macro.

  	<p>To program a submacro to activate within a macro, begin normal macro recording as noted above.</p> <p>Then press the ALT key, then the FUNCTION key, and finally the submacro's number key.</p>
---	---

 	<p>After entering the remaining characters, end the macro recording by pressing the FUNCTION and ENTER keys.</p>
--	--

The multiplexer is already pre-programmed to operate with common RS-232 VCRs. The first eight submacros are programmed to emulate the RS-232 commands for standard VCR functions:

Play	Frame Advance
Record	Frame Reverse
Rewind	Stop
Fast Forward	Freeze

From the Macro menu, select Edit Submacro. This box opens as shown. Select the submacro's number.

```
Submacro Edit
-----
Select Submacro
  01
```

Next, the submacro's edit box opens.

```
Submacro 01 Edit
-----
000 066 013 010 --- -----
[P] [B] [X] [Y]
Delay1: 237                      Delay2: 239
      [CANCEL]                      [OK]
-----
ENTER key starts Submacro edit
```

During the editing operation, the bottom line changes to:

ENTER key terminates Submacro at cursor

The ten programmable bytes for each submacro can be changed according to the required RS-232 command string required for your RS-232 device. The default RS-232 commands for submacros 1 through 8 are RS-232 VCR functions.

Each submacro string byte can be set to any value from zero through 255. In addition, two delay values can be transmitted instead of bytes. These delays are labeled **Delay1** and **Delay2** (approximately 200 msec and 500 msec respectively). The user can change the numerical codes for **Delay1** and **Delay2**. The default codes are **237** and **239** respectively.

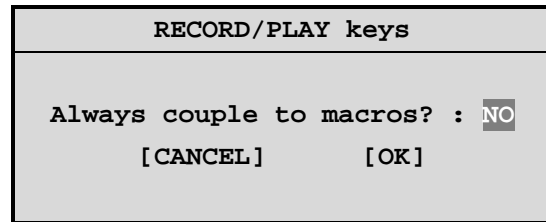
NOTE: Be sure to choose delay codes from among numbers that are **not** used in the submacro itself.

Main Menu → Macro → PLAY/RECORD Link

This menu item enables Play and Record commands to be transmitted simultaneously to the RS-232 VCR when the corresponding keys are pressed on the multiplexer.

Setting this option to YES makes the multiplexer's PLAY and RECORD keys function as do the corresponding keys on the VCR.

When operating these functions, the **LIVE** key must be pressed when switching between Play and Record.


**Front Panel VCR Controls**

The unit can control the following VCR functions through the front panel keypad.

Play	Frame Advance
Record	Frame Reverse
Rewind	Stop
Fast Forward	Freeze

To access these control functions, the multiplexer must be connected to the VCR through the RS-232 port. See **RS-232 Remote Protocol**, page 8-1, as well as the installation information provided with your RS-232 VCR.

To Control the VCR Functions

	<p>First, activate the Alternate mode by pressing the red ALT key on the keypad.</p> <p>The ALT key is a toggle on/off key. A red LED above the ALT key lights when the mode is active. When the mode is active, the associated VCR function keys are operational.</p> <p>The VCR function keys are identified with red symbols for the action they perform while in this mode.</p>
---	--

The VCR functions keys activated in the Alternate mode are as follows:

Function	Key	Indicator †
Play	PLAY	VCR PLAY
Record	RECORD	VCR REC
Rewind	Left Arrow	VCR REW
Fast forward	Right Arrow	VCR FF
Frame advance	Up Arrow	VCR F ADV
Frame reverse	Down Arrow	VCR F REV
Stop	ENTER	VCR STOP
Pause	FREEZE	VCR PAUSE
† In the Alternate mode, on-screen indicators appear for a few seconds after the selected function is initiated. These indicators appear in any monitor display mode.		

NOTE: To turn off the Alternate mode and return to normal keypad operations after performing the VCR functions, press the **ALT** key again.

5.7 Main Menu → Motion Detection

These options are discussed below.

Enable/Disable Detection
Setup Active Zones
Indicate Detection
Activity/Intrusion
Setup Parameters
Exit

The units offer complete motion detection, including built-in false alarm rejection, sensitivity settings, and size discrimination per camera. Motion detection is used to adjust the rate at which cameras are recorded (Activity Detection), and as an intrusion alarm sensor to trigger an alarm input (Intrusion Detection).

The difference between Intrusion detection and Activity detection is useful when digital video motion detection is used. An ability to reduce false motion alarms is a major difference between intrusion detection and activity detection.

NOTE: Some outdoor environments have complex intrusion detection requirements. In those cases, use a motion detector intended specifically for such situations. If the unit is intended for intrusion detection, read this section before installing the cameras and setting up the motion detection menus.

Activity Detection

Activity detection looks for luminance changes in selected areas of the screen. Changes above a set threshold are interpreted as activity. Lighting changes or camera vibration may be falsely interpreted as activity. This method is used in the motion detection offered by most multiplexers, and is adequate to detect activity in a scene when false detection is not important. Typically, activity detection is used to detect activity in crowded areas, where activity is not the result of intruders, and where movement is normal and expected.

Intrusion Detection

Intrusion detection looks for unusual movement in the scene. If any is found, an alarm is raised. This feature is used to monitor areas where no movement is allowed or expected, so that, when movement is found, it has probably been caused by an intruder. It is important that intrusion detectors do not cause false alarms resulting from lighting changes, camera vibration, or random reflections of light in the scene.

If alarm input is activated by one of the unit's internal motion detector channels, the system does not differentiate between an input from another alarm sensor and the input activated by the link from the internal motion detection.

Motion Detection Symbols

Motion Detection displays the letter **M** for motion detection on all monitors. The factory default is set to activate this letter. If on-screen letter is not desired, select **NO** in the Indicate Detection menu. This is a global setting, affecting all cameras with enabled motion detection. If motion has been turned on but no **M** appears when motion is present, check the Setup Active Zones and the sensitivity settings in the Activity Parameters Setup.

Main Menu → Motion Detection → Enable/Disable Detection

The factory default for Motion Detection is the disabled mode. Program all motion, type, parameter, and grid setups before enabling motion detection. (The last setup item should be the enabling of motion detection.)

Individual Enable
Enable All
Disable All
Exit

Enable individual cameras using Individual Enable. Alternatively, select **Enable All** or **Disable All** from this menu.

Main Menu → Motion Detection → Enable/Disable Detection → Individual Enable

This menu appears if **Individual Enable** is selected in the previous menu.

Detection Enable	
Detection on Camera 01:	ENABLE
Detection on Camera 02:	DISABLE
Detection on Camera 03:	ENABLE
Detection on Camera 04:	ENABLE
Detection on Camera 05:	ENABLE
Detection on Camera 06:	DISABLE
Detection on Camera 07:	ENABLE
	:
	:
	:
Detection on Camera 16:	ENABLE
↓↓↓	
[CANCEL]	[OK]

Main Menu → Motion Detection → Setup Active Zones → Active Zones

Select the Setup Active Zones menu and the camera to set up. Then press **ENTER**, and select by number the camera to be programmed. This displays the 256 zones arranged in a 16x16 grid.

Active Zones
Select Camera
01

NOTE: All cameras can have motion detection disabled. This must not be confused with enabling or disabling individual zones within the camera scene.

RECOMMENDATION: Disable zones that may contain **incidental movement**. Incidental movement includes:

- Trees that can sway in the wind.
- Pedestrian and vehicular motion.
- Reflections from glass, other highly polished surfaces, and stretches of water. These can be sources of apparent motion.

Cursor


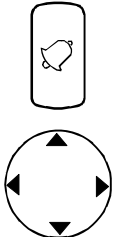
	<p>The upper left zone has a flashing square symbol, known as the cursor. The zone with the flashing cursor can be enabled or disabled. Use the arrow keys to move the cursor to the grid zones to be changed. (When the cursor reaches the end of a line in the zone grid, it wraps around to the beginning of the next line.)</p> <p>The ALARM key selects the Enable, Disable, or No Action mode. The ALARM key toggles between three possible zone setup modes, and the flashing cursor changes color as shown in.</p>
---	---

Table 5-4. Colors of the Flashing Cursor

Choice	Color of Flashing Cursor
No Action	Gray/White
Enable Zones	Black/White
Disable Zones	Clear/White

No Action

	<p>Use the ALARM key to select No Action mode, and then use the arrow keys to go to the first zone to be changed.</p>
--	---



Enable Zones

Changes disabled zones to enabled zones. Enabled zones sense all motion.

Disable Zones

Changes enabled zones to disabled zones. Disabled Zones ignore all motion.

After selecting Enable/Disable Zones mode with the ALARM key, the flashing cursor changes to the selected mode. Use the **arrow** keys to move the cursor and enable or disable adjacent zones as necessary. Change the mode to No Action when no adjacent zones require a change.

Enabled zones have a gray symbol  , and disabled zones have a clear symbol  inside the corresponding grid position.

The factory default is that all zones are enabled.

Sensitivity Scope Settings

The unit uses graphic symbols for motion sensitivity settings, simplifying the motion detection setup. In addition to the flashing cursor, on-screen text prompts appear as follows:

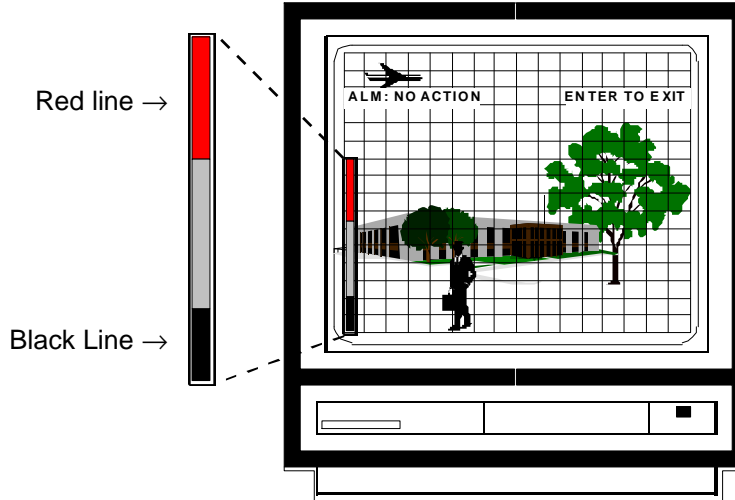


Figure 5-1. Sensitivity Scope Image

The Sensitivity Scope symbol is in the lower left of the image. This scope displays the sensitivity setting as a red line. A black line moves from bottom to top of the scope when a change (motion/activity) occurs in the scene. When the black line reaches the Red line, a motion alarm is activated.

In this mode, selecting number keys (1 through 10) changes sensitivity, and actual motion helps to determine appropriate sensitivity settings.

When all zones are set up, press **ENTER** to save all changes, and go back to the Motion Detection menu.

Main Menu → Motion Detection → Indicate Detection

Use this menu to specify whether detection is to be indicated (by displaying an **M**).

Indicate Detection	
Detection :	<input checked="" type="checkbox"/> ON
[CANCEL]	[OK]

Main Menu → Motion Detection → Activity/Intrusion

Specify whether each camera is to sense Activity or Intrusion.

Motion Detection Type		
Camera	01:	ACTIVITY
Camera	02:	ACTIVITY
Camera	03:	INTRUSION
Camera	04:	ACTIVITY
Camera	05:	ACTIVITY
Camera	06:	INTRUSION
Camera	07:	ACTIVITY
	:	
	:	
	:	
Camera	16:	ACTIVITY
	↓↓↓	
	[CANCEL]	[OK]

NOTE: If Intrusion Detection is to be used, please read the following sections carefully.

Main Menu → Motion Detection → Setup Parameters

Select a camera in this box.

Motion Detection Setup	
Select Camera	
	01

If the camera has been set for Activity detection, this box appears.

Activity Parameters Setup	
Camera	: 01
Sensitivity	: 05
Record Rate	: 4x
Relay Output	: 2
	[CANCEL] [OK]

If the camera has been set for Intrusion detection, this box appears.

Intrusion Parameters Setup	
Camera	: 01
Sensitivity	: 05
Rejection	: LOW
Target Size	: 001
Link to ALM (Salvo)	: 01
	[CANCEL] [OK]

Activity Detection Sensitivity

The motion detection sensitivity for each camera can be set to levels of from 1 through 10. This setting is made on a camera-by-camera basis, and applies to all enabled zones in any particular camera scene. Each of the 256 zones (16x16 grid) distinguishes among 256 grayscale levels averaged over the zone's area.

Changes in the 256 gray levels in a zone can be set as shown in Table 5-5.

Table 5-5. Sensitivity Settings

Sensitivity Setting	Meaning [†]
1 (least sensitive)	100
2	75
3	55
4	40
5 (factory default)	30
6	23
7	17
8	12
9	8
10 (most sensitive)	5
[†] An entry of <i>N</i> in this column means that the unit detects a change of: <i>N</i> gray levels out of 256 averaged over the zone.	

NOTE: The highest sensitivity (10) is reasonable only if the video signal has very little noise.

RECOMMENDATIONS: If motion is indicated without apparent cause, reduce the sensitivity. When setting sensitivity, select the highest setting that does not result in frequent false motion detection. The higher the sensitivity, the more likely it is that incidental movement will be detected as motion.

When setting high sensitivity, such as 8 through 10, sources of false motion should be absent.

Record Rate

This setting is only used in Activity Detection. The multiplexer shares one VCR among many cameras. As a result, the video from one camera (60 fields/second in NTSC/EIA, 50 in PAL/CCIR) must be time-sliced and reduced to a lower field rate, allowing other cameras to insert fields into the same video stream going to the VCR.

If little movement is present in the scene, the lowered update rate for each camera is not a problem. If activity is present in the camera view, it is best to generate as many updated fields of the activity as possible so that all activity events are recorded.

The unit resolves this matter in two ways:

1. A very fast, optimized update rate to tape at 2-hour alarm speeds for NTSC/EIA (3-hour for PAL/CCIR) is up to three times as fast as most other multiplexers.
2. If ongoing motion occurs within a camera's field of view, the update rate for each camera is automatically adjusted by the system. In this way, cameras without activity are recorded less often, and cameras with frequent activity are recorded more often.

A unique feature of the unit is the increase in update rate that can be set in the Record Rate option. Active cameras can record either two or four times as often as normal. Alternatively, they can be interleaved allowing flexibility to set up a custom installation.

Record Rate has four choices for activity:

Table 5-6. The Four Record Rate Activity Choices

Choice	Description
None	Used when most cameras are expected to sense motion at the same time, or when the particular camera scene is not important yet has a lot of motion.
Interleaved	When very few cameras sense motion at any one time.
2x	Used when not all cameras are connected.
4x	This is the factory default.

The camera field displays the number of the selected camera, and can not be changed.

Activity Parameters Setup	
Camera	: 01
Sensitivity	: 06
Record Rate	: 4x
Relay Output	: NONE
[CANCEL]	[OK]

Relay Output

(This setting is used only in Activity Detection. Intrusion should be linked to alarm input, and activate an alarm output relay).

Two alarm relay outputs are provided to enable automatic external actions such as a VCR speed change, an alarm, floodlights, or sirens. The alarm relay outputs are rated at 500 mA continuous (1,000 mA momentary), and are isolated. They are programmable either N/O or N/C. Activity detection, alarms, video loss, and Macro functions control the two relays.

There are four choices on relay output for activity on each camera:

- None (no relay is activated).
- Relay 1.
- Relay 2.
- Both relays.

The factory default setting for Alarm Output Relays is as follows:

All Alarm Inputs:	activate	Relay 1
All Activity Detection:	activates	Relay 2
All Video Loss:	activates	None

Intrusion Detection Sensitivity

NOTE: Setting Intrusion parameters is essential for proper operation of the detection system. Read this section carefully!

Do not use sensitivity level 10 with Intrusion; use level 9 carefully. When setting high sensitivity, such as 8 through 10, eliminate sources of false motion.

See **Sensitivity Scope Settings**, page 5-26.

RECOMMENDATION: Select the highest setting that does not result in frequent false motion detection. The higher the sensitivity, the more it is that likely it is that incidental movement will be detected as motion.

Rejection Levels

This setup is used with Intrusion detection to minimize the possibility of false alarms. Motion detection and false alarms vary from scene to scene, but processing to reduce false alarms can often result in reduced motion detection sensitivity.

To optimize performance, the unit has three false alarm rejection settings for each camera. The factory default setting is LOW for all cameras.

Table 5-7. The Three False-Alarm Rejection Settings

Setting	Description
Low	Used if the intended targets are detected, and few false alarms result.
Medium	Used if frequent false alarms result from changes in light or apparent movement over the whole camera scene. Some causes are lights being turned on and off, objects passing very close to the camera lens, camera vibration, or the sun going behind clouds.
High	Used if frequent false alarms result from flashes of light on reflective surfaces, infrequent fast moving objects such as birds, or other changes. If using the High setting, see Lens Selection for Intrusion Detection below.

The false alarm rejection setting should be left on Low. Before changing the setting to Medium or High to reduce false alarms, confirm that the sensitivity, target size, and active zones are set up properly. Do not select a higher false alarm rejection level unless necessary.

Target Size Settings

The unit's target size setting is related to the number of zones a single target fills. This setup is only used for intrusion detection and defines the minimum size. Set the target size between 1 and 256 for each camera. The factory default target size setting is 1. This means that all sizes of targets result in motion detection if the sensitivity is set up properly.

Target Size

The size of a target for motion detection (normally a human being) varies depending on the camera lens and the distance from the camera. In general, if size discrimination is considered during the detection of motion, fewer false alarms result from small animals, movement of plants in the wind, or reflections.

NOTE: The sensitivity and target size should be set up before the false alarm rejection is changed. Do not enable zones for areas characterized by frequent incidental movement.

The sensitivity setting can affect the degree of detection within each zone, and must be adjusted together with the target size for best performance.

Estimate how many zones the target normally fills based on the camera view, and enter that number as the target size.

EXAMPLE: If a person normally fills a 5x2 grid on a particular camera scene, which is 10 zones, then the target size for that camera should be entered as 10.

RECOMMENDATION: Set the target size to the lowest reasonable setting for the target and the camera scene. For more reliable intrusion detection, the target size should preferably be set to at least 2.

Lens Selection for Intrusion Detection

Motion is more easily detected if an intruder crosses the field of view. The unit is less sensitive to motion toward or away from the lens.

Select a lens so that a person always fills two or more zones in the camera scene.

Select the lens and field of view so that the target remains in the field of view for at least two seconds at expected target speeds.

Link to Alarm

This setup is used only for Intrusion detection. The multiplexer's motion detection is used as a sensor to activate alarm inputs. The multiplexer allows a link from the internal motion detection directly to the unit's alarms to create a motion-based, alarm sensor input. No physical wiring to link to alarm input is required.

The system does not distinguish between in input from an external alarm sensor, and an input activated by the internal motion detection link. If an alarm is activated by one of the unit's internal motion detector channels, it reacts in the same manner as it would with any other external sensor.

Linking Intrusion to Alarms

Select the alarm number to be activated (1 through 16) in the menu. Remember that the alarm input Record List always takes priority over the activity Record List. If an alarm results from motion linked to alarm input, the activity Record List is ignored while an alarm is active.

Linking Intrusion to Macro Functions

To link Intrusion detection to a macro indirectly, link it to an alarm input that has been set to initiate macros.

5.8 Main Menu → Camera Titles

Use this menu to specify:

- Which monitors (if any) are to display the camera titles.
- What those titles are for each camera.

Title Display
Edit Titles
Exit

Main Menu → Camera Titles → Titles Display

Use this menu to specify which monitors (if any) are to display the camera titles.

Titles Display
Monitor A : <input type="checkbox"/> ON
Monitor B : ON
Monitor C : ON
Monitor D : ON
Monitor E : ON
[CANCEL] [OK]

Main Menu → Camera Titles → Edit Titles

Use this menu to select a camera whose name is to be edited.

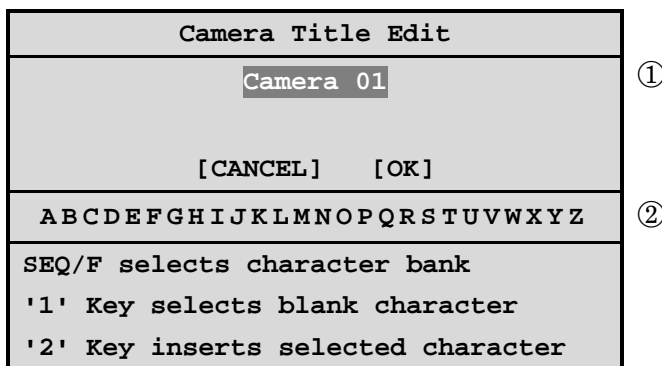
Edit Camera Title
Select Title
01

Main Menu → Camera Titles → Edit Camera Title

Initially, row ② is blank.

Edit the camera's title as follows:

1. Press **ENTER**. The alphabet appears in ②, and the camera's current title appears in ①.
2. Press the **FUNCTION** key to browse forward through the available alphabets (typically eight in number). Press the **SEQUENCE** key to browse backward.
3. Select a location in the camera's title ① using the left/right arrow keys.
4. Select a character in row ② using the **up/down arrow** keys.
5. Use the **2** key to insert the selected character at the selected location.
6. Use the **1** key to insert a space character at the selected location.
7. When finished, press **ENTER** again.
8. Use the **arrow** keys to highlight either [CANCEL] or [OK], and exit.



5.9 Main Menu → Camera Setup

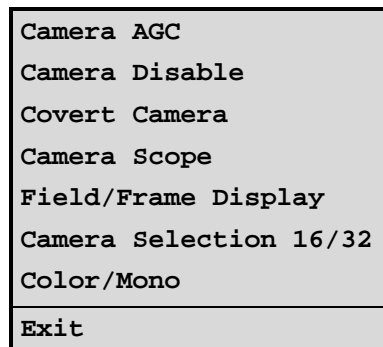
Use this menu to specify for each camera:

- The AGC setting.
- Whether the camera is enabled or disabled.
- Whether the camera is Covert (not viewed on Live display).

With **Camera scope**, the user can display a digital representation of the unit's view of the incoming signals.

Also, use this menu to specify for each camera:

- Whether field or frame resolution is to be used in full-screen.
- Whether the Expansion Unit is connected.
- Whether a camera is color or monochrome.



Camera Automatic Gain Control

The multiplexer has a versatile camera-by-camera automatic gain control (AGC) range adjustment that compensates for camera output signals whose video levels are outside the normal range. (This function is normally set up during initial installation.)

EXAMPLE: Cameras with auto-iris lenses can be adjusted during installation so that the video is consistently at a higher level (brighter) than standard video signals. This adjustment compensates for cable losses and improves the general video appearance. But it can also elevate the video levels above the camera's preset AGC. The unit provides correction of the input AGC separately for each camera from the front-panel controls.

Adjusting the Camera's AGC

Select the Camera AGC menu from the Camera Setup menu.

Select the camera to be adjusted. The camera view appears in the background of the menu screen. (The default AGC range setting is **5** for all inputs.) Adjust the range from 1 through 10 to alter the image.

NOTE: To ensure optimum performance, this feature should not be used as a substitute for properly setting camera video levels.

Main Menu → Camera Setup

Adjust the camera's AGC gain here.

Signal Gain Setup	
Camera	:01
Gain	:05
[CANCEL]	[OK]

Main Menu → Camera Setup → Camera Disable

Individual Disable: Provides a listing from which each camera can be disabled or enabled individually.

Power Up Disable: If activated, disables cameras whose sync or video levels are missing from the video inputs when power is applied to the unit.

Auto Disable Now: Disables cameras whose sync or video levels missing from the video inputs.

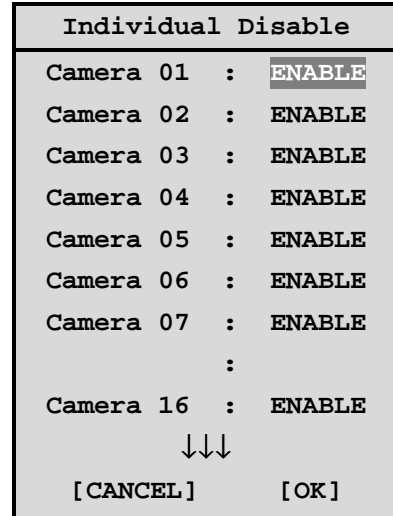
Individual Disable
Power Up Disable
Auto Disable Now
Exit

If a camera is not installed, the continuous on-screen display of the video loss letter **V** for a cameo (**VDL** for a full-screen) can distract an operator. In addition, too much time must be spent removing the camera from the sequence lists. The unit can be programmed in one step, setting active cameras as disabled, so that the symbols **V** or **VDL** do not appear. In addition, disabled cameras are removed from all programmable sequence lists and the Record Lists. This feature is useful when a camera is undergoing maintenance or has a temporary fault.

NOTE: The disabled setting does not affect cameras displayed on Monitor A during Play mode.

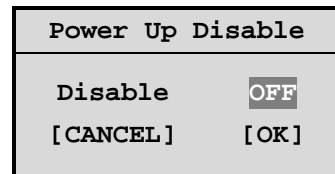
Main Menu → Camera Setup → Camera Disable → Individual Disable

Use this menu to enable or disable cameras individually.



Main Menu → Camera Setup → Camera Disable → Power Up Disable

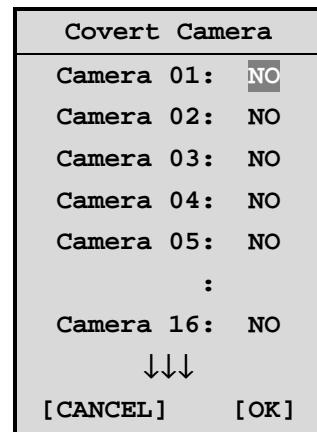
Use this menu to turn this feature on or off.



Main Menu → Camera Setup → Covert Camera

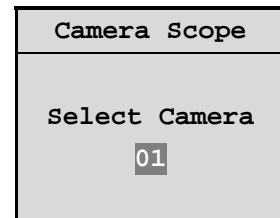
This menu allows cameras to be removed from the Live display without affecting the recording of the camera. In this way, operators and subjects are not aware of cameras being recorded.

Covert cameras can be viewed in Play mode without changing this setting.



Main Menu → Camera Setup → Camera Scope

Use this menu to display a video histogram of the selected camera.



Carefully check the system's camera setups to optimize the motion detection abilities for the associated signal. The camera scope displays characteristics of incoming camera video signals, allowing the user to determine quickly whether cameras and lenses have been set up properly. The user can also determine whether a camera's output signal level and dynamic range are suitable for the motion detection circuits in a multiplexer.

The following three test charts show sample results of relative amplitude tests for camera luminance levels. Such charts can indicate whether an installation is satisfactory.

Relative Amplitude Charts

In Figure 5-2, the camera has a wide range of luminance, yielding a signal with a high level of detail suitable for video motion detection.

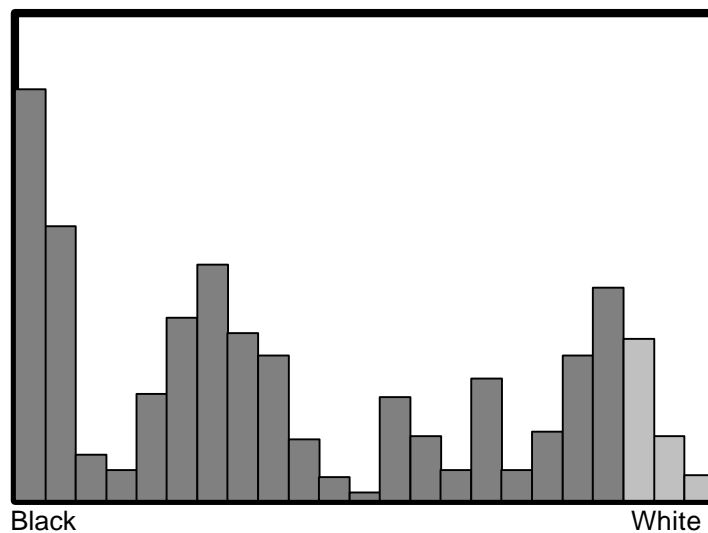


Figure 5-2. Wide Range of Luminance = High Detail

In Figure 5-3, the camera's luminance levels are low and have a smaller range. This makes it harder to discern detail when viewing live camera displays or multiplexed camera recordings. Relatively few gray levels are digitized, and changes with time are less likely to be detected by the circuits that detect video motion. As a result, this camera is not suitable for video motion detection.

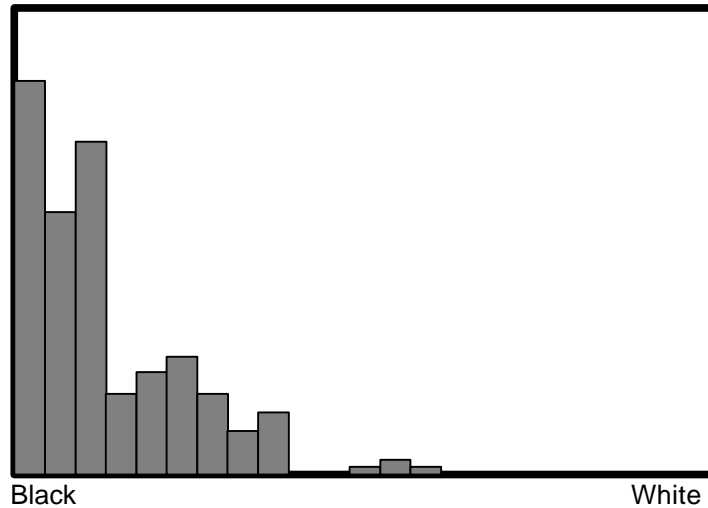


Figure 5-3. Low Luminance = Lack of High Detail

In Figure 5-4, the camera's lens (or AGC) is improperly adjusted, resulting in high luminance levels. As a result, detail in the scene is likely to be lost during multiplexed recording, and video motion detection is impaired.

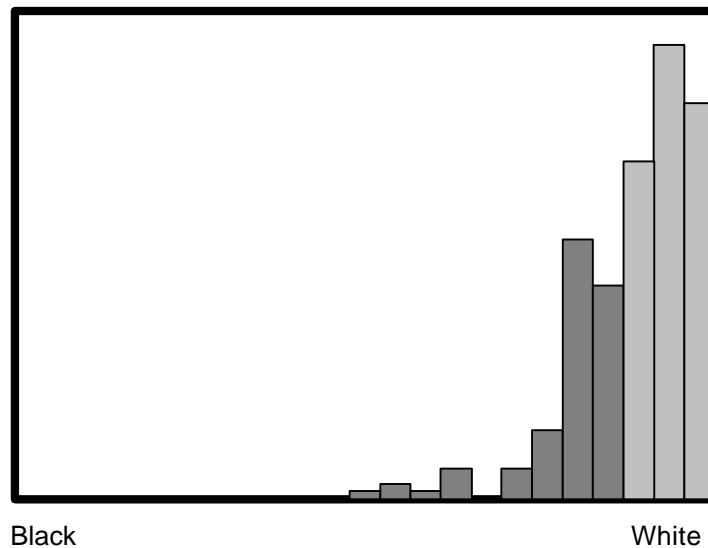


Figure 5-4. Few Gray Levels = Digitized Viewing

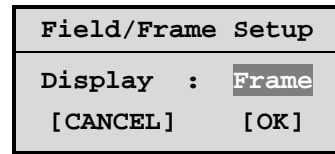
Benefits of the Camera Scope

An inexperienced installer can check input video signals to the multiplexer without the need for additional signal measuring equipment and its associated cost. This is especially useful if intrusion detection is intended. Troubleshooting of the system after installation is simplified.

If a problem is reported for the system, the camera scope displays are so simple that an off-site technical-support person can easily get an on-site person to describe the camera scopes. This enables a diagnosis to be made without incurring the time and expense of a site visit.

Main Menu → Camera Setup → Field/Frame Display

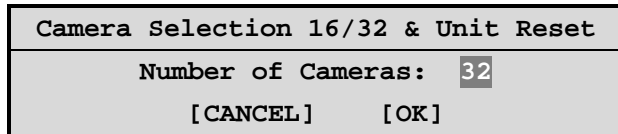
With digital full-screen displays, the Field and Frame settings switch the resolution between field and frame displays. The lower resolution field displays result in less flickering on some high-contrast camera scenes. The default setting is **Frame**.



Main Menu → Camera Setup → Camera Selection 16/32

CAUTION: Changing this setting initiates a **reboot to factory defaults**.

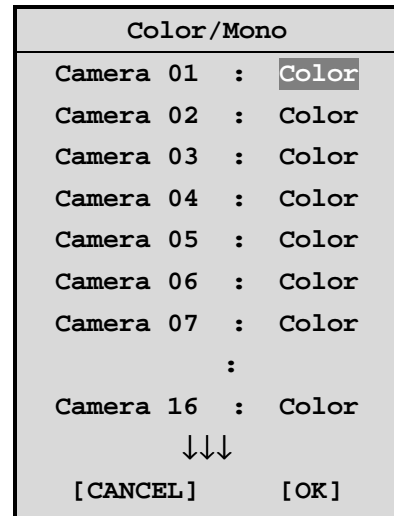
Use this menu to specify whether the Expansion Unit is connected.



Main Menu → Camera Setup → Color/Mono

The Color/Mono menu is useful if a black-and-white (monochrome) camera is replaced with a color camera, or a change is made from a monochrome to a color display. The Color/Mono menu must be accessed from the Camera Setup menu to change the default settings from color to monochrome.

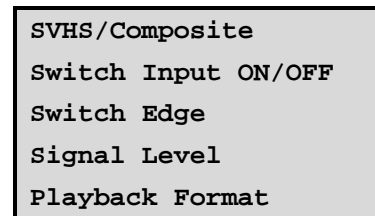
Specify either monochrome (black and white) or color images for each camera.



5.10 Main Menu → VCR Setup

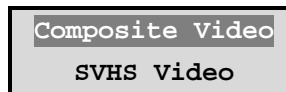
Use this menu to specify:

- The type of VCR (SVHS or composite) that is connected to the multiplexer.
- Whether the VCR is using a switched input (VEXT).
- Whether switching occurs on a positive or negative edge.
- Signal level.
- Playback format.

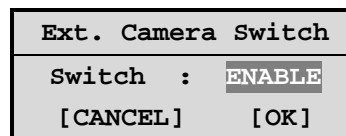


Main Menu → VCR Setup → SVHS/Composite

There are Super VHS (SVHS) and composite video signal VCRs available. Highlight the appropriate selection, and press **ENTER**.

**Main Menu → VCR Setup → Switch Input ON/OFF**

This feature synchronizes the normal and alarm record speeds of the unit with those of the time-lapse VCR. No VCR speeds have to be programmed for setup in the menus. Speeds are adjusted only at the VCR itself. Most time-lapse VCRs provide a hard-wired pulse output for multiplexers, indicating the VCR has just completed recording one field of the current camera. This signals the multiplexer to switch to another camera's output signal.



See **VCR Synchronization**, page 1-6.

This feature can be enabled or disabled in the program menus through the **Switch Input ON/OFF** selection in the VCR Setup menu. The factory default setting is **ON**, which allows the auto-detection circuit to operate, and is the recommended setting.

NOTE:

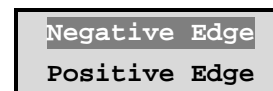
On power up, the auto-detection circuit waits up to 15 seconds to see whether the VCR is sending switch pulses. This period is approximately the interval between switch pulses when the VCR is running in 960-hour mode.

During this interval, the multiplexer does not send encoded video to the VCR unless a switch pulse is detected. If the switch pulses are missing, the multiplexer takes up to 15 seconds to determine that the VCR has actually stopped sending pulses (instead of having its speed changed to the 960-hour mode).

An on-screen abbreviation, **REXT**, replaces the record speed symbol while the switch input is active and detected by the unit.

Main Menu → VCR Setup → Switch Edge

Use this menu to select a negative edge or positive edge of the VCR's pulse for triggering the VEXT input.

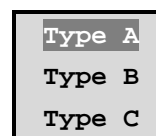


CAUTION: Do not change this setting without first consulting Customer Support.

Main Menu → VCR Setup → Signal Level

The multiplexer has a switch to select among VCR types in the VCR Setup menu.

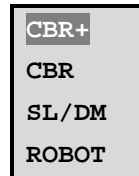
The unit is designed to operate with common (Type A) time-lapse VCRs. The less common (Types B and C) VCRs have different signal levels.



CAUTION: Do not change this setting without first consulting Customer Support.

Main Menu → VCR Setup → Playback Format

Use this menu to specify the playback mode. The unit can decode tapes recorded on other multiplexers. If a tape from a Dedicated Micros or Robot-compatible multiplexer is to be played back, the proper format must first be selected from the unit's menus. This setting can be found in the Playback Format menu.



NOTE: If an alternate decoding format is selected, *CALIBUR* tapes will not be properly decoded.

The format for decoding *CALIBUR Plus* recorded tapes is the factory default setting.

When videotapes are decoded, one of the following labels appears on the display:

Calibur Plus:	CBR Plus
Calibur:	CBR
Calibur Lite:	SL/DM
Dedicated Micros:	SL/DM
Robot:	ROBOT

With normally formatted tapes, if the recording was made using the camera switch input (VEXT), then the mode and speed display reads **PEXT**.

The letter **V** appears in an image if video loss occurred on that camera at the time of recording. The letter **A** appears in an image on Monitor A if an alarm occurred during recording.

Tapes that Can Not be Decoded

If the unit can not decode a tape being played back, the system displays a blank screen. The fields are not decoded or separated. Two possible reasons why a tape can not be decoded are:

- The tape was not recorded on a multiplexer.
- The tape is not compatible with the decoding format selected in programming.

If the tape was actually recorded on a *CALIBUR*-compatible multiplexer, a Dedicated Micros unit, or Robot unit, check to see that the correct **PLAYBACK** format has been selected in the menus.

5.11 Main Menu → Communications

Use this menu to specify:

- The communication settings to be used for the RS-232 port.
- The unit's unique network address on the RS-485 bus.

RS232
RS485
Exit

Main Menu → Communications → RS232

The menu functions and front panel controls can be set up through the RS-232 port, providing programmable remote control from a PC or similar controller.

Connected through a DB-9 connector on the rear panel, the RS-232 functions are:

- All menu programming.
- All front panel keys.
- Alarm history read.
- Alarm input status read.

1200 Baud
2400 Baud
4800 Baud
9600 Baud

RS-232 baud rates are selectable from 1200 to 9600. The factory default is 9600. Set the baud rate from the here.

See **RS-232 Remote Protocol**, page 8-1.

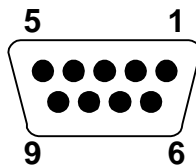


Figure 5-5. The RS-232 Port (Rear Panel)

Table 5-8. RS-232 Pin Assignments and Functions

Function	Pin Numbers
Receive Data (RX)	2
Transmit Data (TX)	3
Ground (GND)	5

Main Menu → Communications → RS485

The unit can have up to 31 optional remote keyboards controlling it through the RS-485 network. In addition, a single remote keyboard can control up to 31 different units (or a mixture of keyboards and multiplexers totaling 32 devices) installed in a multi-drop configuration. The unit address on the RS-485 network is programmable, and sets the unique address of the multiplexer from 1 through 32.

Specify the RS-485's unique network address.

Network Address
001

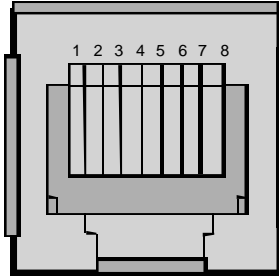
With a properly wired RS-485, the length is limited to 3,200 feet (1,000 meters) from node to node.

A remote keyboard can be up to 1,000 meters from the actual unit without requiring additional transmission equipment.

The connection details are shown in Table 5-9.

Table 5-9. RJ-45 Pin Connections

Pin	Use
1	GND (Shield)
2	+12 V _{DC}
3	Network +ve
4	(N/C)
5	(N/C)
6	Network -ve
7	GND (Shield)
8	+12 V _{DC}



RJ-45 socket on rear panel.

For networks longer than thirty feet, the user must terminate the network at each end.

The network is polarity-dependent. Connect pin 3 to pin 3, pin 6 to pin 6, and so forth. Do not reverse the polarity of the network.

Do not use the 12 V_{DC} power leads in the RS-485 cable unless it is to be used in a one-to-one connection between a unit with 12 V_{DC} power and a keyboard with no 12 V_{DC} power. For example, from a multiplexer directly to a keyboard that does not have its own power supply.

This power configuration was designed for demonstration purposes, and is not intended for normal use. In all other circumstances, such as multi-dropped multiplexers, do not use the 12 V_{DC} power leads in the RS-485 cable.

For more details on the remote keyboard, refer to the **CALIBUR CBR-KB2 Remote Keyboard** manual.

5.12 Main Menu → Front Panel Lock

This menu option is used to lock and unlock the front panel controls of the multiplexer.

Once Lock Keyboard is selected, the only operative key is MENU. The multiplexer can be operated again only after entering the proper password.



5.13 Main Menu → Factory Settings

CAUTION!

Entering **8,1,1,1**
resets **ALL** settings (except time and
date)
to the factory defaults!

Password Box	
Please enter the Factory Password	

[CANCEL]	[OK]

5.14 Main Menu → Passwords

Use this menu to change the passwords for the menu system.

Installer Password
Operator Password
Exit

Main Menu → Passwords → Operator Password

Use this box to change the Operator password.

Password Box	
Enter a new Operator Password	

[CANCEL]	[OK]

NOTE: As noted in Section 4.7, page 4-4, confirmation and message boxes subsequently appear.

Main Menu → Passwords → Installer Password

Use this box to change the Installer password.

Password Box	
Enter a new Installer Password	

[CANCEL]	[OK]

NOTE: As noted in Section 4.7, page 4-4, confirmation and message boxes subsequently appear.

6 SERVICE AND RETURNS

Maintenance

Maintenance of this unit is limited to external cleaning and inspection.

Factory Service: Ventilation, Environment, and Temperature

Verify the environment is well ventilated and the cooling vents on the multiplexer are not blocked. Do not place the unit on top of other equipment that might increase the operating temperature of the unit.

Refer all servicing to qualified personnel.

WARNING!

Do not open the top cover or attempt to service the unit as this may expose personnel to dangerous voltage and other hazards.

Returns

If the unit requires factory service, contact your dealer or distributor for the correct procedure concerning returns to the factory or to the nearest factory service center.

If the dealer or distributor is not available, contact Kalatel as detailed below and request a Return Material Authorization (RMA) number.

NOTE: The unit's serial number must be provided before an RMA number can be issued.

Unit returns to the factory for service must include:

- Prepaid freight and insurance. C.O.D. shipments are not accepted.
- The RMA number is clearly marked on all shipping documents and the outside of the container.
- The failure symptoms must be clearly described and enclosed with the unit.
- A copy of the invoice from the original dealer or distributor.

Failure to comply with these instructions will delay service of unit and may result in the unit not being accepted by the Repair Center.

Factory Address:

Kalatel

P. O. Box 3004

Corvallis, OR 97339

United States of America

Telephone: (800) 343-3358 (7:00 AM to 4:30 PM, Pacific time)

In Oregon: (541) 754-9133

Facsimile: (541) 754-7162 (24 hours a day)

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7 TECHNICAL SPECIFICATIONS

NOTE: All specifications are subject to change without notice. Kalatel believes all specifications are correct, but no liability is assumed for omissions or errors whatsoever.

Multiplexer Connectors (EIA/CCIR-Compatible) (One each unless otherwise noted)		
Interface	Type	Description
Cameras ↓ MUX	BNC	Ten or sixteen looping connectors. Both color and monochrome camera signals are accepted.
VCR ↓ MUX	BNC	Composite video. This connector is present on all units.
	4-pin mini-DIN	Y/C (luminance/chrominance) video. This connector is present on color units only.
MUX ↓ VCR	BNC	Composite video. This connector is present on all units.
	4-pin mini-DIN	Y/C (luminance/chrominance) video. This connector is present on color units only.
MUX ↓ Monitors	BNC	Monitor A (digital multiscreen).
	BNC	Monitor B (analog switching).
	4-pin mini-DIN	Monitor A (digital multiscreen).

Video Parameters	
Signal conditioning	Input AGC, 0.7 to 2.0 V _{PP} composite video inputs accepted.
Termination	75-ohm, or HI-Z if looped, auto-terminating.
Display memory	1,024x1,024 memory array 8 megabytes
Resolution	Horizontal: 720 pixels Vertical: 484 active lines (NTSC/EIA) 576 active lines (PAL/CCIR)
Gray scale	256 levels

Alarm Handling	
Alarm inputs	Sixteen menu-programmable as either N/O or N/C.
Alarm outputs	Two form C relays (one N/O contact, and one N/C contact). Rated 500 mA continuous, 1,000 mA momentary.
Alarm latching	Three settings: <ul style="list-style-type: none"> • Latched. • Transparent. • Timed-out, programmable (1 to 100 seconds).
Alarm recording	Programmable: <ul style="list-style-type: none"> • Automatic priority control. • Interleaved. • Exclusive. • None.
Alarm displays	Automatic, and full-screen.

Motion Detection	
Zones per camera	256: 16x16 grid
Sensitivity settings	10 levels
Gray levels per zone	256 levels
Recording priority	2x, 4x, interleaved, or none.
Status Output	RS-232 status. Relays, link to alarms.

Remote Control and Programming	
RS-232	DB-9, female, three-wire, N-8-1, 1200 to 9600-baud. Allows: <ul style="list-style-type: none"> • Remote programming of menus. • Uploading of status data. • Remote control of front panel keys.
RS-485	RJ-45 Remote keyboard input. Looping Range: up to 1,000 meters (3,200 feet) without conditioning.

Keys and Indicators		
1 through 16	Keys	Each selects a corresponding camera, full-screen.
ALARM	Key LED Buzzer	Used to accept alarms. An LED flashes on any alarm. A buzzer sounds
Arrow	Key	Multiple-arrow key used in menus, panning, and tilting.
ENTER	Key	Selects menu items when programming. Initiates the Active Cameo mode, LED lit in Active Cameo mode.
FREEZE	Key	Freezes any display in Live or Play mode.
FUNCTION	Key	Begins execution of a macro (a pre-recorded key sequence). The user can record ten or sixteen macros.
LIVE	Key, LED	Selects Live mode.
MENU	Key	Enters and exits menu screens for programming of unit. Password-protected.
MONITOR B	Key LED	Selects Monitor B for full-screen displays in Live or Play mode.
MULTISCREEN [Monitor A Key in Figure 1-1]	Key	Selects multiscreen displays in Live or Play mode. Toggles through list of multiscreens.
Pan and Tilt	Key	Multiple-arrow key provides digital pan and tilt on zoomed images.
PLAY	Key, LED	Selects playback mode for decoding tapes.
RECORD	Key, LED	Selects record mode. Duplex models are always in record mode; key is active only on Simplex units.
SEQUENCE	Key	Starts or stops sequencing. Operates on both multiscreen and full-screen displays. Selectable dwell time and AutoList on-screen indicators.
TIME and DATE	Key	Displays time and date to select formats plus daylight savings time change function.
ZOOM	Key, LED	Zooms 2x, fully interlaced, on full-screen displays.

Video Indications	
Alarms Video loss Record speed Playback Titles: 12 characters plus camera number Display can be turned off. VCR view: The VCR can be selected as an input to aid VCR setup, by pressing first the FUNCTION key, and then the PLAY key.	

Physical	
Dimensions	1U, 19" rack unit (MMX-165C) 17.5 x 14 x 1.7 in. (444 x 360 x 43 mm)
	1U, 19" rack unit (MMX-325CE) 17.5 x 10.5 x 1.7 in. (444 x 360 x 43 mm)
Weight	Nominal: 9 lb. (4 kg)
Finish Protection	Zinc-coated metal surfaces.
Finish Paint	Dark gray powder coat, light texture.

Environmental	
Temperature	Operating: 0 to 40 °C
Relative Humidity	90% (non-condensing)

Electrical	
Input voltage	12 V _{DC} A 110-240 V _{AC} adapter is included.
Power	Nominal: 25 W

Item	Model Numbers
PAL/CCIR models	Append (X) to the part number.
Remote keyboard	CBR-KB2 or CBR-KB2/J Includes motorized pan/tilt/zoom (PTZ) control capabilities.
Rack Mount Kit	CBR-RK (1U height) P/N 0110-R201
Replacement Manual	P/N 0150-0112
Replacement Power Supply	4010-0012

8 RS-232 REMOTE PROTOCOL

COMMUNICATION TYPES:

A. Remote Front Panel Simulation

i) Data Structure

Byte 1: 0xFF

Byte 2: 0x55

Byte 3: Front panel key code

ii) Description

Byte 1 and 2 are communication type ID bytes. Byte 3 contains the code for a specific front panel key.

The different keys and their corresponding codes (in **decimal** notation) are as follows.

NO_KEY	0
Multiplexers do not respond to consecutive duplicate commands. As a result, this command must be placed between consecutive duplicate commands.	
RECORD_KEY	1
PLAY_KEY	2
LIVE_KEY	3
ALARM_KEY	4
FREEZE_KEY	5
PAUSE_KEY	5
ZOOM_KEY	6
SEQ_KEY	7
QUAD_KEY	8
CAM_1_KEY	9
CAM_2_KEY	10
CAM_3_KEY	11
CAM_4_KEY	12
CAM_5_KEY	13
CAM_6_KEY	14
CAM_7_KEY	15
CAM_8_KEY	16
CAM_9_KEY	17
CAM_10_KEY	18
CAM_11_KEY	19
CAM_12_KEY	20
CAM_13_KEY	21
CAM_14_KEY	22
CAM_15_KEY	23
CAM_16_KEY	24
Reserved	25-40
MENU_KEY	41

ENTER_KEY	42
Reserved	43
MACRO_KEY	44
MACRO_SPECIAL_1	45
MACRO_SPECIAL_2	46
MACRO_SPECIAL_3	47
MACRO_SPECIAL_4	48
MACRO_MENU_KEY	49
MON_B_KEY	50
Reserved	51-63
LEFT_ARROW_KEY	64
RIGHT_ARROW_KEY	65
UP_ARROW_KEY	66
DOWN_ARROW_KEY	67
UP_LEFT_KEY	68
DOWN_LEFT_KEY	69
UP_RIGHT_KEY	70
DOWN_RIGHT_KEY	71
MACRO_SPECIAL_5	72
MACRO_SPECIAL_6	73
Reserved	74
ALARM_SEQ_KEY	75
Puts the unit into AutoList programming mode.	
ALARM_CAM_1_KEY	76
The sixteen ALARM_CAM_N_KEY commands (where N equals 1 through 16) generate pseudo-alarms remotely.	
ALARM_CAM_2_KEY	77
ALARM_CAM_3_KEY	78
ALARM_CAM_4_KEY	79
ALARM_CAM_5_KEY	80
ALARM_CAM_6_KEY	81
ALARM_CAM_7_KEY	82
ALARM_CAM_8_KEY	83
ALARM_CAM_9_KEY	84
ALARM_CAM_10_KEY	85
ALARM_CAM_11_KEY	86
ALARM_CAM_12_KEY	87
ALARM_CAM_13_KEY	88
ALARM_CAM_14_KEY	89
ALARM_CAM_15_KEY	90
ALARM_CAM_16_KEY	91
Reserved	92-107
MON_C	108
MON_D	109
MON_E	110
Reserved	111-117

B. Remote Data and Commands

i) Data Structure

Byte 1: 0xFF
 Byte 2: Command Type
 Byte 3: Data Length n
 Byte 4: Data Type
 Byte 5: Data byte 1
 Byte 6: Data byte 2
 :
 :
 Byte x: Data byte n

ii) Description

Byte 1: Always 0xFF
 Byte 2: Command Type
 0xAA: (SET) Update system with data
 0xBB: (GET) Extract data from system
 0xCC: (DO) Reserved
 Byte 3: Contains number of data bytes in the stream [n]. Range: 0-255
 Byte 4: Indicates the data type
 The data bytes start at Byte 5.

The data types (Byte 4) are as follows:

For Command Types SET and GET

0: TITLE1
 1: TITLE2
 2: TITLE3
 3: TITLE4
 4: TITLE5
 5: TITLE6
 6: TITLE7
 7: TITLE8
 8: TIMEDATE
 9: HISTORY
 10: Reserved
 11: Reserved
 12: RECLIST
 13: ENCAMERA
 14: ENALARM
 15: DWELLMULTISCREEN
 16: DWELLFULLSCREEN
 17: ALARMTIMEOUT
 18: ALARMINP
 19: MACROLINK
 20: BAUDRATE
 21: DISPLAYTD
 22: DISPLAYTITLE
 23: PBFORMAT
 24: ALARMMODE
 25: TDFORMAT
 26: LANGUAGE
 27: EXTSWITCH
 28: NORRECSPEED
 29: ALMRECSPEED

30: MACRO1
 31: MACRO2
 32: MACRO3
 33: MACRO4
 34: MACRO5
 35: MACRO6
 36: MACRO7
 37: MACRO8
 38: MACRO9
 39: MACRO10
 40: MACRO11
 41: MACRO12
 42: MACRO13
 43: MACRO14
 44: MACRO15
 45: MACRO16
 46: TITLE9
 47: TITLE10
 48: TITLE11
 49: TITLE12
 50: TITLE13
 51: TITLE14
 52: TITLE15
 53: TITLE16
 54-57: Reserved
 58: ENABLACTIVITY
 59: UP_ACT_SETTINGS
 60: UP_ACT_GRID
 61: UP_ALM_AND_VDL
 62: DN_ACT_SETTINGS
 63: DN_ACT_GRID_1
 64: DN_ACT_GRID_2
 65: DN_ACT_GRID_3
 66: DN_ACT_GRID_4
 67: DN_ACT_GRID_5
 68: DN_ACT_GRID_6
 69: DN_ACT_GRID_7
 70: DN_ACT_GRID_8
 71: DN_ACT_GRID_9
 72: DN_ACT_GRID_10
 73: DN_ACT_GRID_11
 74: DN_ACT_GRID_12
 75: DN_ACT_GRID_13
 76: DN_ACT_GRID_14
 77: DN_ACT_GRID_15
 78: DN_ACT_GRID_16
 79: DN_TIMED_MACRO
 80: REC_LOCK
 81: VCR_TYPE
 82: SWITCH_EDGE
 83: NETWORK_ADDRESS

For Command Type DO

0: Reserved

Uploading Data Bytes

When a message of type 0xBB is sent to the system, the system responds by sending a 0xFF start byte, followed by the requested information, which is followed by a 0xFF stop byte.

Changing and Accessing Individual Parameters

a) Changing Camera Titles

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 13
buffer[3]: TITLE1 to TITLE16
buffer[4]-buffer[16]: The title (12 ASCII characters + NULL terminator)

b) Changing the Time and Date

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 12
buffer[3]: TIMEDATE
buffer[4]: Month MSB
buffer[5]: Month LSB
buffer[6]: Day MSB
buffer[7]: Day LSB
buffer[8]: Year MSB
buffer[9]: Year LSB
buffer[10]: Hour MSB
buffer[11]: Hour LSB
buffer[12]: Minute MSB
buffer[13]: Minute LSB
buffer[14]: Second MSB
buffer[15]: Second LSB

c) Request the Alarm History List

buffer[0]: 0xFF
buffer[1]: 0xBB
buffer[2]: 0
buffer[3]: History

d) Reserved

e) Reserved

f) Changing the Record List

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 30
buffer[3]: RECLIST
buffer[4]-buffer[33]: List of 30 numbers.
Allowable numbers: 1-16

g) Enabling or Disabling Certain Cameras

buffer[0]: 0xFF

buffer[1]: 0xAA
buffer[2]: 16
buffer[3]: ENCAMERA
buffer[4]-buffer[19]: List of 16 numbers
(0 = Disable; 1 = Enable)

h) Enabling or Disabling Certain Alarms

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 16
buffer[3]: ENALARM
buffer[4]-buffer[19]: List of 16 numbers digits
(0 = Disable; 1 = Enable)

i) Changing the Multiscreen Dwell Time

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 1
buffer[3]: DWELLQUAD
buffer[4]: Dwell time in seconds (1-99)

j) Changing the Full-Screen Dwell time

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 1
buffer[3]: DWELLFS
buffer[4]: Dwell time in seconds (1-99)

k) Changing the Alarm On Time

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 1
buffer[3]: ALARMTO
buffer[4]: Alarm time in seconds (1-99)

l) Alarm Input Configuration

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 16
buffer[3]: ALARMINP
buffer[4]-buffer[19]: List of 16 numbers
(0 = N/C; 1 = N/O)

m) Changing the Macro Link Values

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 16
buffer[3]: MACROLINK
buffer[4]-buffer[19]: List of 16 numbers digits (1-16)

n) Changing the Baud rate of the Remote Channel

buffer[0]: 0xFF

buffer[1]: 0xAA
 buffer[2]: 1
 buffer[3]: BAUDRATE
 buffer[4]: Number (1 = 1200; 1 = 2400;
 2 = 4800; 3 = 9600)

o) Enable or Disable the Display of the Time and Date

buffer[0]: 0xFF
 buffer[1]: 0xAA
 buffer[2]: 1
 buffer[3]: DISPLAYTD
 buffer[4]: Number (0 = Disable;
 1 = Enable)

p) Enable or Disable the Display of the Titles

buffer[0]: 0xFF
 buffer[1]: 0xAA
 buffer[2]: 1
 buffer[3]: DISPLAYTITLE
 buffer[4]: number
 (0 = Disable; 1 = Enable)

q) Changing the Playback Format

buffer[0]: 0xFF
 buffer[1]: 0xAA
 buffer[2]: 1
 buffer[3]: PBFORMAT
 buffer[4]: Number (0 = CBR+/CBR decode;
 1 = SL/DM; 2 = ROBOT-compatible)

r) Changing the Alarm Mode

buffer[0]: 0xFF
 buffer[1]: 0xAA
 buffer[2]: 1
 buffer[3]: ALARMMODE
 buffer[4]: Number (0 = Latched;
 1 = Transparent; 2 = Timed Out)

s) Changing the Time and Date Format

buffer[0]: 0xFF
 buffer[1]: 0xAA
 buffer[2]: 2
 buffer[3]: TDFORMAT
 buffer[4]: Time format
 (0 = 12 hours; 1 = 24 hours)
 buffer[5]: Date format
 (0 = mm/dd/yy; 1 = dd/mm/yy; 2 =
 yy/mm/dd)

t) Changing the Menu Language

buffer[0]: 0xFF
 buffer[1]: 0xAA
 buffer[2]: 2

buffer[3]: LANGUAGE
 buffer[4]: Language: (0 = English;
 1 - 4: per software supplied)

u) Enabling/Disabling the External VCR Switch

buffer[0]: 0xFF
 buffer[1]: 0xAA
 buffer[2]: 1
 buffer[3]: EXTSWITCH
 buffer[4]: Number (0 = Disable; 1 = Enable)

v) Setting the Normal Record Speed

buffer[0]: 0xFF
 buffer[1]: 0xAA
 buffer[2]: 1
 buffer[3]: NORRECSPEED
 buffer[4]: Number (1-13)

w) Setting the Alarm Record Speed

buffer[0]: 0xFF
 buffer[1]: 0xAA
 buffer[2]: 1
 buffer[3]: ALMRECSPEED
 buffer[4]: Number (1-13)

x) Creating a Macro Sequence

buffer[0]: 0xFF
 buffer[1]: 0xAA
 buffer[2]: number of bytes starting from
 buffer[4]
 buffer[3]: MACRO1 to MACRO16
 buffer[4]-buffer[x]: The macro sequence keys

The numerical values of the keys are as follows:

Record	1
Play	2
Live	3
Alarm	4
Freeze	5
Zoom	6
Sequence	7
Multiscreen	8
1	9
2	10
3	11
4	12
5	13
6	14
7	15
8	16
9	17
10	18
11	19
12	20
13	21

14	22
15	23
16	24
Setup	25
Select	26
Reserved	27-28
Macro Special 1	29 (Activate Output 1)
Macro Special 2	30 (Reset Output 1)
Macro Special 3	31 (Pause 1 second)
Macro Special 4	32 (Pause 5 seconds)
Reserved	33
Mon_B key	34
Reserved	35-47
Left Arrow key	48
Right Arrow key	49
Up Arrow key	50
Down Arrow key	51
Up Left key	52
Down Left key	53
Up Right key	54
Down Right key	55
Macro Special 5	56 (Activate relay 2)
Macro Special 6	57 (Reset relay 2)

The last byte macro buffer[x]: 58
(MACRO_END)

The number of bytes in a macro can not exceed 32.

y) Enable Activity Detection

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 16
buffer[3]: ENACTIVITY
buffer[4]-buffer[19]: List of 16 numbers
(0 = Disable; 1 = Enable)

z) Request Activity Settings

buffer[0]: 0xFF
buffer[1]: 0xBB
buffer[2]: 0
buffer[3]: UP_ACT_SETTINGS

aa) Request Activity Grid

buffer[0]: 0xFF
buffer[1]: 0xBB
buffer[2]: 0
buffer[3]: UP_ACT_GRID

ab) Request Alarm and Video Loss Status

buffer[0]: 0xFF
buffer[1]: 0xBB
buffer[2]: 0
buffer[3]: UP_ALM_AND_VDL

ac) Download Activity Grid

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 32
buffer[3]: DN_ACT_GRID_1 to
DN_ACT_GRID_16
buffer[4]-buffer[35]: digits corresponding to
zones. Two bytes per row, 16 rows.
(1 = Active; 0 = Off)

NOTE: This message must be used with caution. Delays of 100 msec must be inserted between consecutive camera grids.

ad) Downloading Timed Macro Information

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 6
buffer[3]: DN_TIMED_MACRO
buffer[4]: Event number (1-20)
buffer[5]: Day (0-8), where 0 = Disabled
buffer[6]: Hour (1-12)
buffer[7]: Minute (0-59)
buffer[8]: AM/PM (0 = AM; 1 = PM)
buffer[9]: Macro Number (1-16)

ae) Setting the Record Lock

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 1
buffer[3]: REC_LOCK
buffer[4]: Setting (0 = off; 1 = on)

af) Setting the VCR Type

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 1
buffer[3]: VCR_TYPE
buffer[4]: Type (0 = A; 1 = B)

ag) Setting the VEXT Pulse Active Edge

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 1
buffer[3]: SWITCH_EDGE
buffer[4]: Edge (1 = Negative; 0 = Positive)

ah) Setting the Network Address

buffer[0]: 0xFF
buffer[1]: 0xAA
buffer[2]: 1
buffer[3]: NETWORK_ADDRESS

buffer[4]: number (0-255)

UPLOADING DATA

a) Alarm History List

When the **Request Alarm History List** message is received by the system, the system sends an ASCII string for every alarm event in its alarm history list. The string is formatted as follows:

dd.bmm/ddBhh:mm:ss<CR><LF>

dd =alarm event number (0-99)

B = space character

mm = month

dd = day

hh = hours

mm = minutes

ss = seconds

<CR><LF> = carriage return/linefeed

b) Activity Settings

Six bytes are uploaded:

- 1)** Sensitivity (1-10)
- 2)** Relay (0 = none; 1 = Relay 1;
2 = Relay 2; 3 = Both relays)
- 3)** Link to Alarm (1-16)
- 4)** False Alarm Reject (0 = Low;
1= Medium; 2 = High)
- 5)** Size Discrimination (1-255)
- 6)** Record Rate (0 = none; 1 = 2x; 2 = 4x;
3 = Interleaved)

c) Activity Grids

16x32 bytes are uploaded. First 32 bytes are zones from Camera 1, the next 32 bytes

are from Camera 2, and so forth. (Two bytes per row, 16 rows.)

d) Alarm and Video Loss

Eight bytes are uploaded. The first four bytes represent the alarms in the system (MSB first). The next four bytes represent the video loss status (MSB first).

9 MACRO FUNCTIONS AND SCHEDULED MACROS

Macro #	Description
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
FUNCTION + PLAY	VCR view Selects the VCR as input so that the VCR can be set up.
FUNCTION + SEQUENCE	Daylight savings time Sets clock ahead one hour in April and back one hour in October.

DAY OF WEEK SETUP			
Monday = _____ (Typically, 1 or 2; see Date/Time menu)			
Event	Day	Time	Macro To Run
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

10 STANDARD WARRANTY CONDITIONS

The conditions stated below take precedence over any new or different conditions and represent the sole responsibility and liability of Kalatel relating to the *CALIBUR* unit. **(Product)**

Kalatel warrants that Products furnished shall be free from defects in material and workmanship for a period of twelve (12) months from the date shipped to Distributor, damage and misuse excepted. Spare parts shall be warranted for ninety (90) days from the date of shipment, or until the end of the Products warranty, whichever is longer. Upon notice of any defect, Kalatel shall, at its option, repair or replace the defective item at no cost to the Purchaser or Distributor.

Purchaser or Distributor shall complete a WFR (Warranty Failure Report), and request a Return Material Authorization (RMA) number prior to returning a defective item, freight and insurance prepaid, within thirty (30) days from receipt of the RMA from Kalatel. Units damaged or lost in transit during return to Kalatel will be Purchaser or Distributor responsibility. Responsibility for the unit will pass to Kalatel upon receipt by Kalatel's receiving department in undamaged condition. Kalatel shall have no obligation to accept or act upon shipments of defective items which are received without an RMA number referenced in the shipping documents and packing list, and a WFR enclosed with the item. Turnaround time for warranty repair will be ten (10) working days from the time the shipment arrives in Kalatel's receiving department. Kalatel will ship repaired or replaced units to Purchaser or Distributors original shipping point.

This warranty is contingent upon proper use in the application for which the Products are intended, and does not cover Products which have been subjected to unusual physical or electrical demands, including static or lightning, or otherwise damaged in any way. Any attempted repair or damage to the unit will void the warranty. Kalatel shall in no event be responsible for failures or malfunctions resulting from the Programmers, Purchasers or Distributors modifications, additions, enhancements, or revisions to a Product without Kalatel's express written approval.

This Warranty constitutes the Sole and Exclusive Remedy of any Buyer of Kalatel's Products, and the Sole and Exclusive Liability of Kalatel in connection with the Products, and In Lieu of all other Warranties, Express, Implied or Statutory, including, but not limited to, any implied Warranty of Merchantability of Fitness for a particular use, and all other obligations or liabilities of Kalatel.

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