

English

# Simplex Multiplexer

Installation and Operation Manual

ADV1487-4, ADV1487-16,  
ADV1587-4, ADV1587-9,  
ADV1587-16

Part Number 8000-2128-01 REV B



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San Diego, CA 92121  
U.S.A.

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DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

DO NOT INSTALL THIS PRODUCT IN HAZARDOUS AREAS WHERE HIGHLY COMBUSTIBLE OR EXPLOSIVE PRODUCTS ARE STORED OR USED.



THE LIGHTNING FLASH/ARROWHEAD SYMBOL, WITHIN AN EQUILATERAL TRIANGLE, ALERTS THE USER TO THE PRESENCE OF A SHOCK HAZARD WITHIN THE PRODUCT'S ENCLOSURE.



Lithium Battery:

**CAUTION:** Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Lithium Batterie:

**VORSICHT:** Explosionsgefahr! Batterie nur mit einem vom Hersteller empfohlenen gleichwertigen Typ ersetzen. Entsorgung muß nach Anweisungen des Herstellers erfolgen.

**WARNING:** This equipment has been tested and found to comply with the limits for a Class "A" digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**NOTE:** This product was FCC verified under test conditions that included the use of shielded I/O cables and connectors between system components. To be in compliance with FCC regulations, the user must use shielded cables and connectors for all except power and alarm cables.

This digital apparatus does not exceed the Class A limits for radio noise emissions as set out in the Radio Interference Regulations (ICES-003) of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables de la Classe A prescrites dans le Règlement (ICES-003) sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

**IMPORTANT  
INFORMATION**

Before proceeding, please read and observe all instructions and warnings contained in this manual. Retain this manual with the original bill of sale for future reference and, if necessary, warranty service.

When unpacking your new American Dynamics product, check for missing or damaged items. If any item is missing, or if damage is evident, **DO NOT INSTALL OR OPERATE THIS PRODUCT**. Contact your dealer for assistance.

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Complete the following product purchase information. The factory requests this information when contacted for technical support. It is also valuable in case of loss or theft.

Purchase Date: \_\_\_\_\_

Serial Number: \_\_\_\_\_

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## SECURITY MEASURES

NOTE: This page describes how to access security sensitive features. You may wish to remove this page from the manual and place it in a secure place.

### Accessing Setup Menus

The setup menu system is accessed from live mode. Press and hold the **FUNCTION** button and press the **VCR VIEW** button (**FUNCTION+VCR VIEW**). The first setup menu appears on screen. Use the **VCR VIEW** and **arrow** buttons to navigate through the menu system. See *Chapter 4 — Setup* for details.

To exit the setup menu system, press **FUNCTION+VCR VIEW** again. The menu disappears and the simplex resumes normal operation.

### The Security Lock Feature

NOTE: Security Lock protects the simplex against unauthorized use by disabling all front panel controls except the **FUNCTION** and **VCR VIEW** buttons. Once engaged, Security Lock can be released only after placing the simplex in setup mode.

### To Engage or Release Security Lock

1. Select the operating mode in which the unit is to be locked.
2. Press and hold the **FUNCTION** button and press the **VCR VIEW** button. The simplex enters setup mode and displays the first setup menu.
3. Press the **VCR VIEW** button repeatedly until the SECURITY LOCK menu appears.
4. Press the **up** or **down** arrow to engage (ON) or release (OFF) SECURITY LOCK.
5. Press **FUNCTION+VCR VIEW** to exit setup mode. The simplex resumes normal operation.

(Cut along this line)

**Resetting the Simplex**    The simplex can be reset to the factory default state. Upon reset, all programmable features return to the factory settings. The reset feature is normally used for diagnostic purposes but may be used to “start from scratch” during system setup.

**To Reset the Simplex**    Press and hold the **FUNCTION** button and press the **up arrow** button. A warning appears, asking if you want to reset the unit to factory defaults. Press **LIVE** to cancel the reset. To continue the reset, press **FUNCTION+up arrow**. The simplex resets and returns to the factory default state.

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# Chapter 1 — About Simplex

The Simplex provides the capability to record multiple video cameras using a videotape recorder (VCR). The Simplex models support either the NTSC/EIA or PAL/CCIR video standards. Simplex models provide a range of display and recording options depending on the number of video camera inputs on each model.

## FEATURES

- High speed switching rate while recording. The Simplex can be set to switch cameras sent to the VCR every second field.
- Automatic VCR speed detection feature lets the Simplex match the VCR's current recording speed if used with a VCR that sends a timing signal.
- Dynamic Time Division (DTD) multiplexing prioritizes camera images sent to the VCR based on picture motion content (record mode only). Independent 16x12 activity (motion) grid for each camera.
- Proprietary encoding method for high quality image playback.
- You can set playback or live multicamera displays to show any of the camera inputs in any position in any display format.
- Four-camera models only: QUAD RECORD OPTION sends a 2x2 image to the VCR. Individual cameras can be viewed full screen when the quad recording is played back.
- High resolution digital images enhanced by proprietary sharpening technique. 512x464 NTSC/EIA (512x512 PAL/CCIR) pixel display with 256 shades of gray or 16 million colors.
- IMAGE TENDERIZER dramatically reduces jitter associated with high resolution compressed multicamera images.
- Rear panel termination switches can be set for each camera.
- Improved Remote control that permits daisy chaining up to 16 Simplex units. The remote panel controls one Simplex at a time, but you can change which Simplex you control.

- ALARM INPUT POLARITY settings: either active high or active low.
- Alarm counter with on-screen summary by camera.
- Independent call monitor output for viewing live alarm events during tape playback.
- On-screen display includes date, time, alarm status, video loss and 10-character camera titles. On-screen menus simplify setup.
- Nonvolatile program memory protects real time clock and all programmable features against power loss.

NOTE: The previous Simplex had a fail-safe feature to switch the Simplex back to record mode if left unattended in playback mode. The new Simplex does NOT switch modes when left unattended.

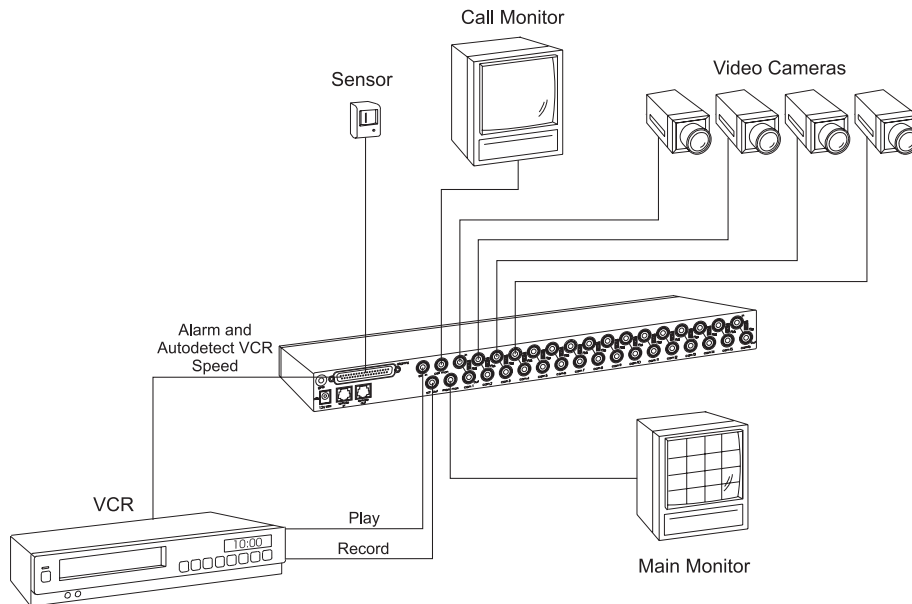


Figure 1 — Basic Simplex System

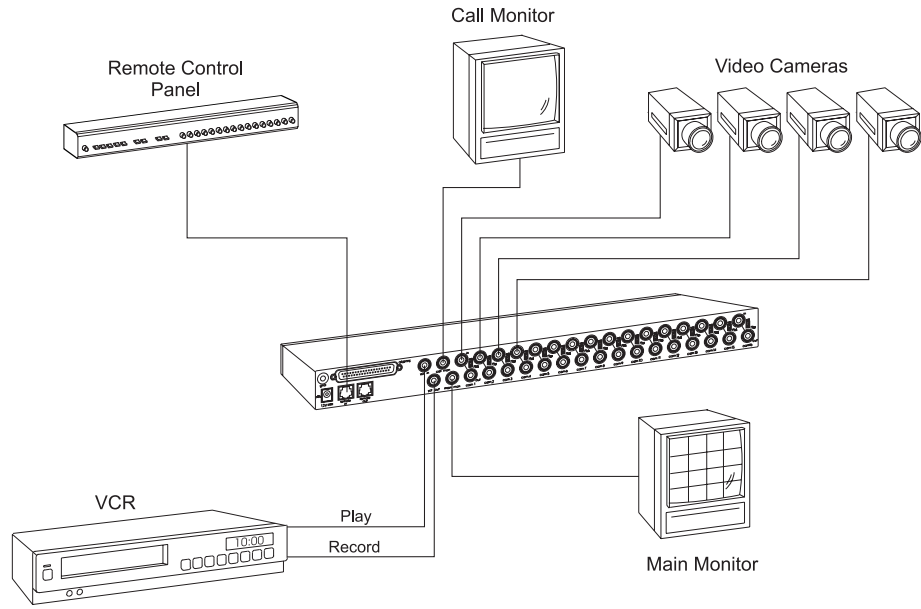


Figure 2 — Basic Simplex System with Remote Panel

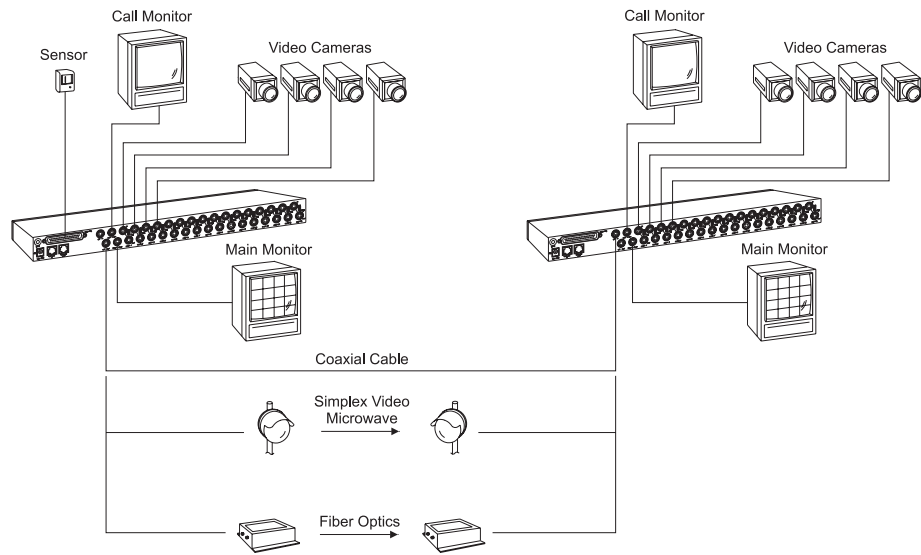


Figure 3 — One-Way Multiplexed Video Transmission

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## TECHNICAL OVERVIEW

**Video Input and Output** The Simplex system features video camera inputs with a passive looping output for each. Synchronizing or phasing cameras is not required.

The Simplex comes with a main monitor output for displaying live camera images or recorded images on a standard monitor. The call monitor output permits viewing live images from a selected camera on a standard monitor.

**Video Display** The main monitor displays either live camera pictures or previously recorded images. The display is based on a 512x464 NTSC/EIA (512x512 PAL/CCIR) x16 bit digital video memory containing two interlaced video images.

The primary function of record mode is to record camera images to videotape, while viewing full-screen images. You can view one camera full-screen or you can sequence full-screen images from each camera on the main monitor.

Four-camera models only: if the QUAD RECORD OPTION is **ON**, you can choose a 2x2 display of the cameras to view and record. If you change to a full screen view, quad recording stops, and images from the cameras will be sent sequentially.

Live mode can be used to view multiple cameras displayed simultaneously. Recording stops while in live mode; the unit only displays live multicamera images. Multicamera display formats include 2x2 for up to 4 cameras, 3x3 for 5 to 9 cameras, or 4x4 for 10 to 16 cameras.

A graphics generator with two interlaced bitmapped pages provides the alphanumeric and graphic overlays for on-screen menus, camera titles and system messages.

- 
- Encoder Output** The Simplex video encoder produces a single video signal containing field by field samples from all camera inputs. The signal is provided in composite format for connection to a video recorder. All inputs are sampled in camera number order until motion is detected; then sampling is weighted in favor of the cameras where activity is detected.
- The encoder uses Vertical Interval Signaling (VIS) technology to encode system information onto video output to the VCR. Time, date, camera title, camera number and alarm status information are placed on the 16 horizontal lines preceding the first active video line. This technique improves vertical sync recovery and eliminates the degraded graphics associated with poor VCR performance.
- Decoder Output** The Simplex decoder processes the video output by the VCR during playback, recovering the video from each camera originally recorded. The decoder digitizes the playback video and recovers the VIS information encoded onto each field. If the recovered field is displayed, it is written to the video display memory.
- Motion Detection** The Simplex provides motion (activity) detection during record mode. The Simplex system continuously monitors all camera inputs for activity. When activity is detected, the Simplex records images from that camera more often. You can set motion sensitivity for each camera input using a 192-target (16 wide by 12 high) graphic overlay. Targets can be turned on or off as required. Target sensitivity is fixed.
- Using proprietary DTD technology, the Simplex system continuously analyzes the motion content (activity) of each camera picture. Cameras where activity is detected will be recorded more often. Every picture sent to the VCR is encoded with the camera number, alarm status, time and date.

## Chapter 2 — Front and Rear Panels

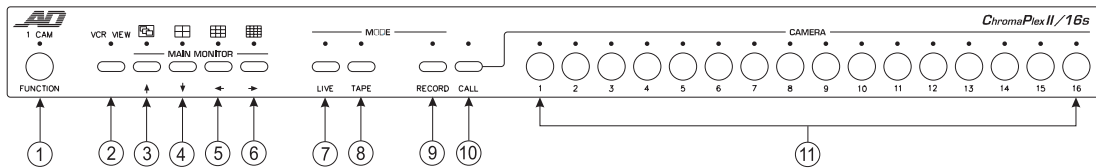


Figure 4 — Front Panel Controls and Indicators

### THE FRONT PANEL

The following is a brief overview of the front panel. Refer to *Chapter 4 — Setup* and *Chapter 5 — Operation* for details on features and panel functions. Some front panel buttons have two functions. The primary button function is listed first, followed by the secondary function in parentheses. Indicator lights (LEDs) are above each button.

1. **FUNCTION (1 CAM)** — Clears ALARM or VIDLOSS message (if ALARM MESSAGE LATCH menu option is **ON**). Provides access to special functions when pressed in combination with other buttons.
  - FUNCTION+down arrow** displays color or gray bar pattern
  - FUNCTION+left arrow** displays alarm count screen
  - FUNCTION+right arrow** **OFF** or **ON** for time/date display
  - FUNCTION+LIVE** stops one-camera recording
  - FUNCTION+CAMERA** starts one-camera recording for that camera
2. **VCR VIEW** — Press **VCR VIEW** to display images being output to the VCR on the main monitor. Pressing **VCR VIEW** while in the menu system moves to the next menu.
3. **sequence (up arrow)** — Press **sequence** to display sequential full-screen images from each camera. This button is also used in the setup menu to move forward through available characters or to choose a menu toggle option. Pressing the **up arrow** also moves the target cursor up one row in motion detection setup.
4. **2x2 (down arrow)** — Press this button to display images from four cameras (quad display). Used in the setup menu



to move backward through available characters or to choose a menu toggle option. Press **down arrow** to move the target cursor down one row in motion detection setup.

5. **3x3 (left arrow)** — Press this button to display up to nine camera images in the 3x3 format (nine and 16-camera models only). Press **left arrow** in the setup menu to move the highlight (cursor) to the left.
6. **4x4 (right arrow)** — Press this button to display up to 16 camera images in the 4x4 format (16-camera models only). Press **right arrow** in the setup menu to move the highlight (cursor) to the right.
7. **LIVE** — Press **LIVE** to display live multicamera images. In live mode, camera images are not recorded (**RECORD LED** is off). Pressing **LIVE** during motion detection setup turns on the row of motion targets on the cursor line.
8. **TAPE** — Press **TAPE** to enter tape playback mode for viewing previously recorded video. Pressing **TAPE** during motion detection setup turns off the row of motion targets on the cursor line.
9. **RECORD** — Press **RECORD** to start full-screen multiplexed recording of all cameras. On a four-camera unit, press **RECORD**, then **2x2** to start recording a quad image (if the **QUAD RECORD OPTION** is **ON**). If you change to a full screen display, the recording will be full-screen instead of quad. You can also press **RECORD** to stop One Camera Recording and resume recording all cameras. Pressing **RECORD** during motion detection setup turns on all motion targets.
10. **CALL** — Press **CALL**, then a **CAMERA** button to change which camera displays on the call monitor. Normally, pressing a **CAMERA** button changes the camera image displayed on the main monitor. When the **CALL LED** is lit, pressing a **CAMERA** button displays that camera on the call monitor. Pressing **CALL** during motion detection setup turns off all motion targets.
11. **CAMERA** — Press a **CAMERA** button to select a camera for full-screen display. Use with the **FUNCTION** button to activate the One Camera Record feature. Use **CAMERA** buttons during motion detection setup to toggle motion targets on or off.

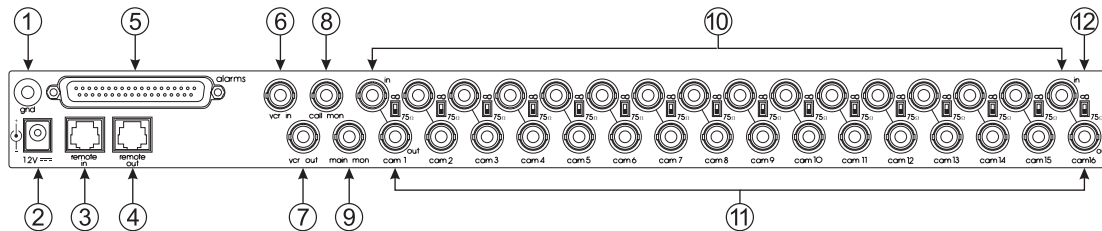


Figure 5 — Rear Panel Connectors

## THE REAR PANEL

1. **gnd** — Use this ground screw when connecting contact or TTL/CMOS compatible alarm devices. See *Alarms* for details.
2. **power** — This 2.1 mm pin jack accepts the Simplex series power module plug or other 12 VDC, center positive source of at least 1 ampere.
3. **remote in** — This RJ11 connector allows remote control of the Simplex via the Remote Control Panel or using RS-232 data.
4. **remote out** — This RJ11 connector allows daisy chaining another Simplex for use with the Remote Control Panel.
5. **alarms** — This DB37-S connector allows alarm activation via contact closure or TTL/CMOS alarm inputs. It includes the Alarm Hold Input and Alarm Output relay contacts.
6. **vcr in** — This BNC connector accepts composite video playback signal from a video recorder.
7. **vcr out** — This BNC connector provides a composite video signal to a video recorder.
8. **call mon** — This BNC connector provides a composite video signal to the call monitor in the full screen format. The call monitor only displays full-screen live images.
9. **main mon** — This BNC connector provides a composite video signal to the main monitor for display in the selected format.
10. **cam in** — These BNC connectors accept the composite video output of B&W or color cameras.
11. **cam out** — These BNC connectors provide looping camera video from the corresponding camera input.
12.  **$\infty$  or 75  $\Omega$  switch** — These switches allow you to set impedance for each camera output. Set the switch to **75  $\Omega$**  to terminate it, or set it to  **$\infty$**  if looping to other equipment.

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## Chapter 3 — Installation

Select a location for the product that is clean and dry and has AC power. Find an environment where temperature and humidity extremes do not exceed the product specification (see *Appendix D — Technical Specifications*). Failure to do so can result in equipment failure and/or loss of warranty protection.

### REQUIRED CONNECTIONS

- |              |   |
|--------------|---|
| Cameras      | Connect the <b>cam in</b> BNC connector to the video output of a camera or other composite video source. Set input impedance termination using the switches between the rows of BNC connectors. If looping through to other equipment, set the switch to $\infty$ . |
| Main Monitor | Connect <b>main mon</b> to the video input of an NTSC/EIA or PAL/CCIR compatible video monitor. The monitor must be properly terminated.  |
| Power        | Connect the power module or other center positive 12 VDC source with at least 1 amp capacity to the <b>power</b> connector.   |

### OPTIONAL CONNECTIONS

- |              |   |
|--------------|---|
| Call Monitor | Connect <b>call mon</b> to the video input of an NTSC/EIA or PAL/CCIR compatible video monitor. The monitor must be properly terminated.  |
| VCR In       | The <b>vcr in</b> connector accepts composite video from a VCR. Connect this input to the composite video output (play) of an NTSC/EIA or PAL/CCIR compatible VCR. The <b>vcr in</b> input is terminated. |
| VCR Out      | The <b>vcr out</b> connector provides composite video to a VCR. Connect this output to the composite video input (record) of an NTSC/EIA or PAL/CCIR compatible VCR. The VCR must be terminated.          |

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Alarm	The <b>alarms</b> connector includes pins for mechanical or TTL/CMOS standard alarm inputs, the alarm hold input and the alarm output. These connections allow the Simplex to be completely integrated with security systems. See <i>Chapter 6 — Alarms</i> and <i>Appendix A — Alarm Connector Pin Assignments</i> for details.
Alarm Inputs	Alarm Inputs may consist of a contact type or TTL/CMOS alarm signal. Connect <b>alarms</b> pins (numbered <b>1–16</b> ) as required, to one side of a contact type or TTL/CMOS compatible alarm device. Connect the remaining side of each device to ground (screw labeled <b>gnd</b> on rear panel). ALARM INPUT POLARITY is menu selectable and defaults to normally open (NO) or TTL/CMOS active low.
Alarm Hold Input	NOTE: This is not normally used. See <i>Record Mode Alarm Response</i> for details.  The Alarm Hold Input accepts an active high contact type or TTL/CMOS alarm signal. Connect <b>alarms</b> pin <b>36</b> to the alarm hold output of the VCR or other device. Connect the remaining side of the output to ground (screw on rear panel labeled <b>gnd</b> ).
Alarm Output	The Alarm Output is a contact type signal between <b>alarms</b> pin <b>17</b> (common) and pin <b>18</b> (normally closed) or pin <b>19</b> (normally open). Connect the appropriate pins to the alarm input of the VCR or other device.
Autodetect VCR Speed	Pin <b>37</b> connects to the VCR to receive the timing signal (it may be named VCR trigger input, sync pulse input or clock) so the multiplexer can send images at a rate matching the VCR recording speed. If the VCR changes its recording speed, the multiplexer automatically adjusts the image rate to match. Check your VCR manual for timing signal information.
Remote	The two RJ11 <b>remote</b> connectors are for the remote control panel option or RS-232 control commands. See <i>Remote Control</i> .
Remote Control Panel	Connect the cable provided with the remote control panel to the <b>remote in</b> connector. If daisy chaining to another Simplex, connect the <b>remote out</b> of this Simplex to the <b>remote in</b> of the next Simplex in the chain. The remote panel and the Simplex front panel operate identically and may be used at the same time. See <i>Remote Control Panel</i> manual for details.

## SYSTEM CHECKOUT

You can check Simplex system operation immediately after installation. While the Simplex itself requires no adjustment, check system components such as monitors, cameras and the video recorder for proper operation and adjustment. The system checkout procedure involves three steps: monitor calibration, camera check and video recorder check. You need at least two video cameras to check system operation. Make certain that all required system connections are made. Apply power to all system equipment.

### Monitor Calibration

Calibration involves adjusting monitor display brightness and contrast based on the standard bar pattern generated by the Simplex system. The procedure is as follows:

1. Press **FUNCTION+down arrow**. A bar pattern created by the Simplex appears on the monitor.
2. (color models only) Turn off any automatic color control features on the monitor that might interfere with manual adjustment.
3. (color models only) Turn the monitor's color level (saturation) control all the way down. The display should now be black and white.
4. Adjust the monitor's contrast and brightness controls so that the eight bars progress evenly from white to black.
5. (color models only) Turn the monitor's color level control to its midpoint.
6. (color models only) Adjust the monitor's tint (hue) control until the colors are correct. The sequence of colors from left to right is: white, yellow, cyan, green, magenta, red, blue and black. Press **LIVE** to exit.

The monitor is now correctly calibrated to the output of the Simplex. While monitor adjustments can be changed to suit the viewer, use the procedure described above *before* attempting to adjust cameras or *before* working on a display or video quality problem. To calibrate the call monitor, connect its video cable to the **main mon** connector on the Simplex and repeat steps 1 through 6.

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**Camera Check** The multicamera display in live mode makes checking camera performance as simple as comparing two pictures on one screen. This method is preferable to the direct camera to monitor technique because it allows precise adjustment of each camera against a chosen reference camera. This minimizes differences between cameras and optimizes picture quality.

NOTE: Before performing a camera check, complete the monitor calibration procedure. Adjusting cameras with a monitor that is out of adjustment does not help.

The camera check procedure is as follows:

1. Complete the monitor calibration procedure.
2. Connect all system cameras directly to the Simplex camera inputs. Remove any devices connected to the looping (lower) camera outputs.
3. Make sure the Simplex is set up for 75-ohm termination. The switches on the back panel should be set for **75 Ω**.
4. Pick the best looking picture and use that camera as a reference. If necessary, adjust this camera for an optimum picture. Do *not* adjust the monitor.
5. Adjust each remaining camera, in turn, for an optimum picture. Try to obtain the same picture quality as the reference camera.

The cameras are now correctly adjusted with respect to the calibrated monitor and each other. You may now adjust the monitor for the best overall display. If you choose to make further monitor adjustments, it is best done with all cameras displayed.

### Making a Test Tape

The easiest way to verify system operation is to make a test recording and play it back. This process effectively tests every piece of equipment in the system.

Before proceeding with recording, we recommend that you complete both the monitor calibration and camera check procedures. Make certain that the monitor and all system cameras are correctly adjusted. This will ensure better results during the test.

The procedure is as follows:

1. Place the Simplex in record mode (press **RECORD**).
2. Place the VCR in the record mode at the 24-hour speed. This is the Simplex default VCR recording speed and can be changed. The VCR begins recording multiplexed camera video.
3. After several minutes, stop the VCR and rewind the tape.
4. Place the VCR in the play mode.
5. Press the **TAPE** button on the Simplex.

When the Simplex detects the encoded VCR signal, it begins displaying recorded video. You can press **2x2**, **3x3** or **4x4** to display recorded cameras in a multicamera format. You can also press a **CAMERA** button to see full-screen images from that camera or press **sequence (up arrow)** for full-screen sequencing of the recorded images.

This completes the test. If the test is not successful, repeat the steps listed above. If you still have trouble, see the *Troubleshooting Guide*.

## Chapter 4 — Setup

### THE SETUP MENU SYSTEM

Simplex features can be configured to suit the requirements of most video installations. A convenient system of on-screen menus allows you to set up key features such as time and date, alarm message display, alarm message latch, video loss alarm, alarm input polarity, alarm output polarity, display record status, quad record option (four-camera units only), image tenderizer, VCR record time, VCR alarm record time, alarm duration, global dwell, camera titles, motion detection and system security. All setup data is stored in nonvolatile memory where it is protected against loss because of power failure.

**NOTE:** To perform system setup, you must first gain access to the on-screen menu system. Refer to *Security Measures* for instructions.

Once inside the menu system, setup involves three basic operations:

1. Selecting the menu.
2. Positioning the flashing highlight.
3. Setting the option.

#### Selecting a Menu

Press the **VCR VIEW** button to go to the next setup menu. The next menu appears with the flashing highlight at the first option. You can only go forward through the setup menus. If you press the **VCR VIEW** button at the last menu (SECURITY LOCK), the Simplex exits the setup mode and returns to normal operation.

#### Positioning the Highlight

Press the **right arrow** to move the highlight to the next option. Press the **left arrow** to move the highlight to the previous option. When you reach one end of the menu, the highlight goes to the other end.

#### Setting an Option

Press the **up** or **down arrow** to move through the available values or characters (0-9, A-Z, :, /, +, - or space). When you reach the last character, the sequence begins again.

Some menu options toggle between two values. Press the **up** or **down arrow** to change the value under the flashing highlight.



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**SETUP MENUS** The following paragraphs take you through the menu system step-by-step, describing each menu's purpose and options.

**System Time/Date** This menu displays the time and date stored in the internal clock/calendar, firmware version number and revision date. During normal operation, the Simplex displays the time and date at the top of the screen and encodes time and date onto each field of video sent to the VCR.

During tape playback the encoded time and date is displayed. The current time and date is NOT displayed.

**NOTE:** Be sure to turn off the VCR time/date display feature. If it is turned on, the tape may not play back correctly, or if the tape does play back, the VCR time and date will also appear over each camera image.

Set the time and date using the **arrow** buttons to position the flashing highlight over each character and set its value. Enter the time in HH:MM:SS 24-hour format. Enter the date in MM/DD/YY format (DD.MM.YY format in the PAL/CCIR version). Note that the clock starts running when you move the highlight into the date field.

**NOTE:** You can turn the time/date display off or on at any time. Press **FUNCTION** and **right arrow** to turn the time/date display off or on.

When you are finished with this menu, do one of the following:

- press **VCR VIEW** to go to the next menu.
- press **FUNCTION+VCR VIEW** to save the information and leave the setup system.

- 
- Toggle Options** The toggle options menu allows you to review and set each option. Toggle options have only two values. To change a value, position the highlight over it and press the **up** or **down arrow**. The other value appears. Toggle options include:
- Alarm Message Display** The ALARM MESSAGE DISPLAY option lets you control whether an ALARM message displays on-screen. It toggles as follows:
- ON** — Alarm messages are displayed on the main monitor.
  - OFF** — Alarm messages are not displayed on the main monitor.
- The default ALARM MESSAGE DISPLAY setting is **ON**.
- Alarm Message Latch** The ALARM MESSAGE LATCH option determines how long the ALARM and VIDLOSS messages remain on screen. (See *Chapter 6 — Alarms* for details.) This option toggles as follows:
- ON** — All messages remain on screen until cleared. Press the **FUNCTION** button to clear messages for all *expired* alarm events. Messages for current alarm events remain on screen.
  - OFF** — Each message remains on screen until the ALARM DURATION time expires or until the corresponding alarm event clears, whichever is longer. (The default ALARM DURATION time is 4 seconds.)
- See *Chapter 6 — Alarms* for a description of alarm operation.
- The default ALARM MESSAGE LATCH setting is **OFF**.
- Video Loss Alarm** The VIDEO LOSS ALARM option controls the video loss detection feature. It toggles as follows:
- ON** — The Simplex responds to loss of camera video with a flashing CAMERA button LED and displays the message VIDLOSS on the main monitor.
  - OFF** — If the VIDEO LOSS ALARM option is turned off, the Simplex does not detect loss of camera video. See *Video Loss Alarms*.
- The default VIDEO LOSS ALARM setting is **ON**.

- 
- Alarm Input Polarity    The ALARM INPUT POLARITY option allows you to set the polarity of all alarm inputs. It toggles as follows:
- ACT LOW** — Active alarm inputs are “low.” The Simplex recognizes a contact closure or TTL/CMOS logic low as an alarm event.
- ACT HI** — Active alarm inputs are “high.” The Simplex recognizes a contact opening or TTL/CMOS logic high as an alarm event.
- The default ALARM INPUT POLARITY setting is **ACT LOW**.
- Alarm Output Polarity    The ALARM OUTPUT POLARITY option allows you to set the active polarity of the TTL/CMOS alarm output signals (pins **20–35**). These alarm output signals echo the alarm inputs (pins **1–16**). You can also control the polarity of the echo. This option toggles as follows:
- ACT LOW** — Active alarm outputs are “low.” An alarm input will be echoed as an active low.
- ACT HI** — Active alarm outputs are “high.” An alarm input will be echoed as an active high.
- The default ALARM OUTPUT POLARITY setting is **ACT HI**.
- Display Record Status    If **ON**, this message shows whether or not the Simplex is sending images to be recorded. The status message displays the current operating mode on the main monitor. It toggles as follows:
- ON** — One of the following messages displays:
- |          |   |
|----------|---|
| REC ALL  | Multiplexed encoding of all cameras.  |
| REC QUAD | With quad displayed, records the quad image if QUAD RECORD OPTION is <b>ON</b> (four-camera models only). |
| REC OFF  | Not recording cameras; message flashes.   |
| 1 CAM=XX | One camera recording of camera no. XX (XX stands for the camera number).                                  |
- OFF** — No message shown.
- The default DISPLAY RECORD STATUS setting is **ON**.

---

Quad Record Option  
(four-camera models only) This option allows you to record quad images rather than the default full screen image recording. The quad image must be displayed to record in quad mode.

**ON** — With quad displayed, records the quad image.

**OFF** — Will NOT record a quad image, or display quad in record mode, only full-screen images sent in record mode.

The default QUAD RECORD OPTION is **OFF**.

Image Tenderizer This feature dramatically reduces the shakiness associated with high resolution compressed multicamera images. During regular operation press **FUNCTION** to temporarily toggle to the other setting to decide whether to use **ON** or **OFF**.

**ON** — Activates the special filtering circuit when the Simplex displays a multicamera image on the main monitor.

**OFF** — Turns off the special filtering circuit.

The default IMAGE TENDERIZER setting is **OFF**.

When you are finished with this menu, do one of the following:

- press **VCR VIEW** to go to the next menu.
- press **FUNCTION+VCR VIEW** to save the information and leave the setup system.

VCR Record Time **NOTE:** If the Simplex alarm output will not be connected to the VCR's alarm input, use the same settings for both VCR RECORD TIME and VCR ALARM RECORD TIME.

This menu allows you to enter the normal (nonalarm) recording speed for the VCR. Use the **up** and **down arrow** buttons to set the speed in hours. The longer you hold the **arrow** button, the faster the setting changes. You may use any setting between **1** and **999** hours.

The default setting for VCR RECORD TIME is **024 HRS**.

**VCR Alarm Record Time** This menu allows you to set the recording speed of the VCR when an alarm is triggered (**1–999** hours). The VCR changes to this speed when alarm input is received.

**NOTE:** If you connect pin **37** on the Simplex **alarms** connector to the VCR, you don't need to set VCR RECORD TIME or VCR ALARM RECORD TIME.

If your VCR provides a timing signal (it may be called vcr trigger input, sync pulse input or clock) connect pin **37** on the Simplex **alarms** connector to the VCR. The Simplex then sends images at a rate matching the VCR speed. See your VCR manual for details.

The default setting for VCR ALARM RECORD TIME is **024 HRS**.

When you are finished with this menu, do one of the following:

- press **VCR VIEW** to go to the next menu.
- press **FUNCTION+VCR VIEW** to save the information and leave the setup system.

**Alarm Duration** This menu allows you to set the minimum alarm time. The ALARM DURATION setting determines how many seconds the Simplex remains in the alarm state after an alarm event occurs. See *Alarm Recording Control* for details.

Set the ALARM DURATION time in seconds using the **up** and **down arrow** buttons. You may enter any setting between **1** and **999** seconds.

The default ALARM DURATION setting is **004 SECS**.

When you are finished with this menu, do one of the following:

- press **VCR VIEW** to go to the next menu.
- press **FUNCTION+VCR VIEW** to save the information and leave the setup system.

---

**Global Dwell** The GLOBAL DWELL menu allows you to set the camera switching rate. The GLOBAL DWELL setting determines the rate at which the cameras are sequenced full screen when **sequence (up arrow)** is selected. It also determines the rate the monitor switches cameras during multiple alarms.

Set the GLOBAL DWELL time in seconds using the **up** and **down arrow** buttons. You may enter any setting between **1** and **99** seconds. This setting applies to all cameras.

NOTE: The GLOBAL DWELL setting only affects the on-screen camera display. It does NOT affect the rate at which camera images are sent to the VCR.

The default GLOBAL DWELL setting is **02 SECS**.

When you are finished with this menu, do one of the following:

- press **VCR VIEW** to go to the next menu.
- press **FUNCTION+VCR VIEW** to save the settings and exit setup.

**Camera Titles Menu** The Camera Titles menu allows you to assign an alphanumeric title to each camera input. It also provides access to the motion detection setup screen.

The camera number is the default title. To change a title, use the **arrow** buttons to position the flashing highlight on each character and set its value. A title can contain up to 10 characters selected from the following: 0-9, A-Z, :, /, +, - or space.

When you are finished setting a title, do one of the following:

- press **FUNCTION** to display the motion detection screen (described below) for the current camera.
- press a **CAMERA** button to set that camera's title.
- press **VCR VIEW** to set the next camera title.
- press **VCR VIEW** after the last camera title to go to the next menu.
- press **FUNCTION+VCR VIEW** to save the information and leave the setup system.

**Motion Setup** The motion setup screen allows you to define motion detection targets in the camera's field of view. This screen is accessed from the Camera Titles menu by pressing the **FUNCTION** button.

The motion setup screen displays the current camera image overlaid with a special graphic. The graphic consists of a 16 wide by 12 high matrix of motion targets, a target cursor, and a motion bar.

The target cursor (a horizontal line) is initially positioned in the first row of targets. Active targets are circled. Inactive targets are not circled. You can turn individual targets off or on, turn a row off or on or turn all targets off or on.

The default motion setup screen looks like this:

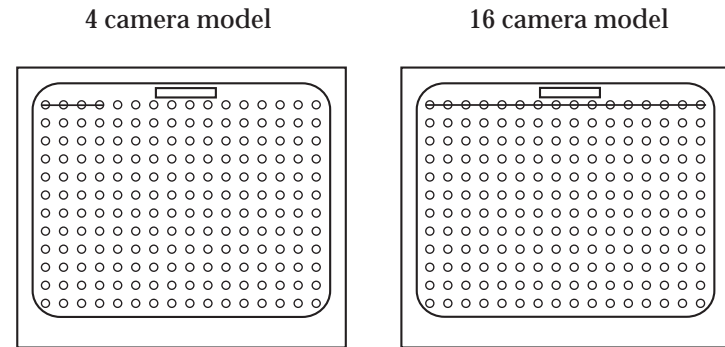


Figure 6 — Motion Setup Screen

The front panel buttons used to set up the targets are as follows:

**up arrow** — moves the target cursor up one row at a time.

**down arrow** — moves the target cursor down one row.

**left arrow** — moves the target cursor line to the left (four- and nine-camera models).

**right arrow** — moves the target cursor line to the right (four- and nine-camera models).

**RECORD** — turns ON all targets.

**CALL** — turns OFF all targets.

**LIVE** — turns ON the row of targets with the cursor line.

**TAPE** — turns OFF the row of targets with the cursor line.

**CAMERA** — toggles the corresponding target on the cursor line.

**FUNCTION** — saves the current motion target settings and returns to Camera Titles.

Use the buttons above to define areas of the picture in which motion is to be detected. When finished, press the **FUNCTION** button to save the target settings and return to Camera Titles.

If motion is detected during motion setup, the Simplex displays a motion bar at the top center of the screen. By watching the motion bar and scene activity, you can quickly determine which arrangement of targets is most effective.

Security Lock Refer to the *Security Measures* section in the front of this manual.



## Chapter 5 — Operation

**OPERATING MODES** The Simplex has three basic operating modes: record, live without record and tape playback. Record mode is the only mode which sends camera images to the VCR and includes motion (activity) detection. Live mode displays cameras without recording the images. Tape playback mode is strictly for viewing a previously recorded tape.

**Record Mode** Press **RECORD** to start sending images to the VCR. The VCR also needs to be properly set up to record images from the Simplex.

The **RECORD** LED is on.

The **TAPE** and **LIVE** LEDs are off.

The on-screen record status message (if set **ON** in the Setup menu) is either REC ALL, 1 CAM=XX or (four-camera models only) REC QUAD.

**Monitor Display:** Pressing a **CAMERA** button shows the selected camera displayed full screen on the monitor. Pressing **sequence (up arrow)** shows a full-screen sequence of camera images at the programmed dwell rate. Multicamera images do not display while in record mode.

**Four-camera models only:** if the QUAD RECORD OPTION is **ON**, multicamera images display in quad format. If the QUAD RECORD OPTION is turned on in the setup menu, pressing **2x2** while in record mode displays the 2x2 image and sends the quad image to the VCR. The on-screen record status message (if set to **ON** in the setup menu) will display REC QUAD. Changing to a full-screen display by pressing either a **CAMERA** button or **sequence (up arrow)** will switch the unit back to a normal recording mode and the message will change to REC ALL.

**VCR Output:** In record all mode, encoded full-screen multiplexed images are prioritized according to activity and alarms, and sent to the VCR. The VCR's time-lapse rate also affects the number of recorded images.

Record mode is the only mode affected by the motion detection feature. Images are sent to tape more often from cameras where activity is detected when motion targets are **ON**.

In one camera recording mode, an encoded full-screen image from the selected camera is output to the VCR at the programmed time-lapse rate.

If REC ALL displays, press **FUNCTION** and a **CAMERA** button to start recording just one camera.

Four-camera models only: if REC QUAD displays, press a **CAMERA** button to get back to full-screen display and into REC ALL mode. Then press **FUNCTION** and a **CAMERA** button to start recording just one camera.

When in one camera record mode, the on-screen record status message is 1 CAM=XX (XX stands for the camera number). The **FUNCTION** LED flashes when just one camera is being recorded. Images from the other cameras will NOT be recorded unless associated with a mechanical alarm.

Alarms A full-screen live image from the camera associated with the alarm is displayed on the main and call monitors. The main monitor also displays an ALARM graphic unless the ALARM MESSAGE DISPLAY toggle option is set to **OFF**. Multiple alarms will sequence full screen on both monitors. Cameras associated with alarms are sent to the VCR more often. See *Chapter 6 — Alarms* for details.

**Live Mode Without Record** Live mode is used for viewing a multicamera image on the main monitor. No recording takes place while in live mode.

The **LIVE** LED is lit.

The on-screen record status message (if set **ON** in the Setup menu) flashes REC OFF.

The **RECORD** and **TAPE** LEDs are off.

Pressing the **LIVE** button displays the images from multiple cameras. You can change the position of each camera on the monitor by pressing and holding a display format button (**2x2**, **3x3** or **4x4**), while pressing camera buttons in the order you prefer. To see a 2x2 display with cameras 4, 2, 3 and 1, you would press and hold the **2x2** button, while pressing **CAMERA** buttons 4, 2, 3 and 1.

Pressing a **CAMERA** button shows the selected camera image displayed full screen on the monitor. If the **CALL** LED is off, the camera displays on the main monitor. If the **CALL** LED is lit, the camera displays on the call monitor. To change which monitor displays a camera, press the **CALL** button, then the **CAMERA** button.

Pressing **sequence (up arrow)** shows a full-screen sequence of camera images at the programmed dwell rate.

Press **VCR VIEW** if you need access to the VCR programming menus.

In live mode, nothing is sent to the VCR and motion is NOT detected.

**Alarms** A full-screen live display of the camera associated with the alarm is shown on the main and call monitors. An ALARM message will also show on the main monitor above the camera number (unless the ALARM MESSAGE DISPLAY menu option is **OFF**). If multiple alarms occur, a sequence of full-screen images from each alarm camera will display on both monitors.

- 
- Tape Playback Mode** Main monitor display: Pressing **TAPE** puts the unit in playback mode to review a previously recorded tape. You can press a display format button (**2x2**, **3x3** or **4x4**) to see a multicamera display, or you can even customize the display by pressing and holding either the **2x2**, **3x3** or **4x4** button and pressing **CAMERA** buttons in the order you want them displayed. Pressing a **CAMERA** button shows the selected camera image from tape displayed full-screen. Pressing **sequence (up arrow)** displays full-screen camera images sequentially at the current dwell rate.
- The **TAPE** LED is lit.
- The **RECORD** and **LIVE** LEDs are off.
- Nothing is sent to the VCR while it is playing back a tape.
- If the **RECORDER STOPPED** message displays on the main monitor, press the play button on the VCR to playback a tape. If you see **RECORDER STOPPED** when you are changing back to record mode, press **RECORD** to take the Simplex out of playback mode and resume recording.
- Alarms** If a live alarm occurs while playing back a tape, the call monitor displays the live camera image. If there are multiple alarms, each displays full-screen on the call monitor. There are no **ALARM** messages, and none of the front panel indicators react to a live alarm.
- If an alarm was recorded to tape, the **ALARM** message displays with the camera image on the main monitor (unless the **ALARM MESSAGE DISPLAY** menu option was **OFF** when the tape was recorded). The LEDs on the front panel are lit for each camera associated with a recorded alarm.
- Videotape Operations** The Simplex allows recording of multiple cameras onto a single videotape.
- VCR Setup** Make certain that the video in of the VCR is connected to the **vcr out** connector on the Simplex rear panel, and that the video out of the VCR is connected to the **vcr in** connector on the Simplex rear panel.

For optimum tape recording or playback, the Simplex should be correctly set up for use with the VCR. This is done by changing settings in the setup menu system.

Two setup options affect camera recording. They are:

VCR RECORD TIME

VCR ALARM RECORD TIME

See *Chapter 4 — Setup: VCR Record Time and VCR Alarm Record Time*.

#### Autodetect VCR Speed Signal

If pin **37** on the **alarms** connector is connected to the VCR for the timing signal (it may be named VCR trigger input, sync pulse input or clock), the multiplexer sends images at the rate the VCR sends pulses. Not all VCRs send a switch pulse signal. Read your VCR manual to see if your VCR has this feature. If the VCR does NOT send a signal, be sure you enter the settings you want in the multiplexer menu for VCR RECORD TIME and VCR ALARM RECORD TIME.

#### Multicamera Recording

Multiple camera recording is as simple as placing the VCR in the record mode, and pressing **RECORD** on the Simplex. The images from all connected cameras are encoded onto videotape. The **RECORD** LED is lit, and the REC ALL message shows on the main monitor.

Four-camera models only: if the QUAD RECORD OPTION is turned on in the setup menu, pressing **2x2** while in the record mode displays the 2x2 image and sends the quad image to the VCR. The on-screen record status message (if set **ON** in the Setup menu) will display REC QUAD. Changing to a full screen display by pressing either a **CAMERA** button or **sequence (up arrow)** will switch the unit back to a normal recording mode and the message will change to REC ALL.

When the Simplex is not recording, the **RECORD** LED is off, and the REC OFF message flashes on the main monitor.

Several factors affect the order and rate at which cameras are recorded. See *Record Mode* for details affecting multicamera recording.

One Camera Recording The Simplex can be set to record just one camera. This feature can be turned on or off at any time. If one camera recording is turned on, the **FUNCTION** LED flashes, the **RECORD** LED is on and the status message 1 CAM=XX shows on the main monitor (XX represents the camera number).

NOTE: When the **FUNCTION** LED is flashing, only the selected camera is recorded. You must press the **RECORD** button to resume recording all cameras.

**To start one camera recording:**

NOTE: Four-camera units only: if the REC QUAD message is displayed on the monitor, press either a **CAMERA** button or **sequence** to get into REC ALL mode. You can start one camera recording when you see the REC ALL message on the monitor.

1. Press and hold the **FUNCTION** button.
2. Simultaneously press the **CAMERA** button to record just that camera.
3. Release both buttons. The monitor displays the selected camera and the **FUNCTION** LED flashes to indicate the system is in the one camera record mode.

**To end one camera recording:**

Press the **RECORD** button to start multicamera recording. The **FUNCTION** LED will go out and the **RECORD** LED will begin flashing.

Tape Playback To play back a videotape, simply press play on the VCR and press the **TAPE** button on the Simplex. The Simplex system decodes the video signal and displays images in the format you choose. You can press a display format button (**2x2**, **3x3** or **4x4**) to see a multicamera display, or you can even customize the display by pressing and holding down the (**2x2**, **3x3** or **4x4**) button while pressing **CAMERA** buttons in the order you want them displayed. You can press a **CAMERA** button to see that camera image full screen, or press **sequence (up arrow)** to display sequenced full screen images from tape. Cameras are decoded in the order they were encoded when the recording was made.

**NOTE:** For quad recordings, if you use time-lapse or pause mode during playback, images may look blocky with just one field displayed. If you press and hold the **FUNCTION** button, you can see both fields displayed. You will get better results with a 2-hour playback speed.

**VCR Special Effects** Most special video playback features can be used while reviewing a recording. Field oriented features such as field advance or still field should work, if the VCR reproduces each video field accurately. Fast forward will NOT produce a satisfactory picture.

**Video Motion Detection** During recording, the Simplex detects changes in camera video at each of its camera inputs. It responds to activity at any camera by increasing the rate at which that camera is encoded (recorded); but the Simplex does not produce an alarm output due to activity.

Motion detection is a powerful feature because it greatly increases the efficiency with which cameras are recorded. Motion detection also helps to ensure that critical site activity is recorded and displayed to the user.

**How Motion Detection Works** The Simplex system continuously scans each camera input for video. When video is detected, the unit captures one video field in digital memory. It then measures the value of up to 192 target pixels in the picture and stores the results for reference. During the next scan, the Simplex measures the target pixels again. The new and old target values are compared. If the target values differ significantly, the Simplex assumes that motion has occurred.

The goal of motion detection is to prioritize cameras for recording. The Simplex gives priority to cameras where motion is detected by sampling them more frequently. The result is that cameras with motion update faster. This technique allows the system to operate at highest efficiency while ensuring that important events are recorded.

**Motion Detection Setup** By default, all 192 motion detection targets are turned on for each camera input. You can tailor motion detection for each camera input by turning any unneeded targets off. Use the motion setup screen to change target settings. See *Motion Setup* for details.

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## Chapter 6 — Alarms

The Simplex system detects and responds to three types of alarm events: mechanical alarms, recorded alarms and video loss. A mechanical alarm event occurs when there is a contact closure at any alarm input. A recorded alarm event occurs when an alarm encoded field is detected during tape playback. A video loss alarm occurs when the Simplex system detects loss of video at an active camera input.

### MECHANICAL ALARMS

The **alarms** connector provides one mechanical alarm input for each camera input. These inputs can be connected to any security device equipped with either a contact closure or TTL/CMOS standard alarm output. Alarm polarity can be selected as either **ACT LOW** or **ACT HI** using the ALARM INPUT POLARITY toggle option in the setup menu.

Each alarm input requires two wires. One wire connects to the desired alarm input pin. The second wire connects to the ground screw (**gnd**) next to the alarm connector. Refer to *Table 1 — Alarm Connector Pin Assignments* for details.



**Alarm Counter** The Simplex counts the number of mechanical alarm events that occur at each camera input. It maintains a total count for each camera until the alarm counter is cleared. The maximum alarm count per camera is 999. Once the counter reaches 999, it does not change until it is cleared.

**To Display the Alarm Counter Screen:**

Press **FUNCTION+left arrow**. The Simplex displays the alarm count for each camera input and the time/date when the count was last cleared.

**To Exit the Alarm Counter Screen:**

Press the **LIVE** button to exit the alarm counter screen. The Simplex removes the Alarm Counter from the screen and resumes normal operation. Alarm counts are NOT cleared and counting continues without interruption.

**To Clear the Alarm Counter:**

Press the **CALL** button to clear the alarm counter. The Simplex resets the Alarm Counter (sets all counts to 000) and updates the ALARM COUNT SINCE date and time. Alarm counting begins immediately.

ALARM COUNT SINCE 00:28:02 05/03/97			
CAMERA	COUNT	CAMERA	COUNT
1	009	9	000
2	001	10	005
3	010	11	000
4	000	12	000
5	014	13	020
6	000	14	000
7	000	15	000
8	000	16	000

PRESS CALL KEY TO CLEAR  
PRESS LIVE KEY TO EXIT

Figure 7 — Alarm Counter

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Record Mode Alarm Response      When a mechanical alarm occurs in record mode, the Simplex alerts the operator and performs tasks required to record the alarm event on videotape.

When the initial alarm is detected in record mode:

1. The associated **CAMERA** LED flashes.
2. The alarm relay is energized.
3. The monitors display a full-screen image of the camera associated with the alarm. With multiple alarms, full-screen images sequence at the current dwell rate on both monitors.
4. The camera image is overlaid with an ALARM graphic on the main monitor (if ALARM MESSAGE DISPLAY is **ON**).
5. The alarm record encoding rate is selected.
6. In REC ALL mode or REC QUAD mode, the camera image is encoded as alarm and output to the VCR on a priority basis.
7. When the Simplex is in one camera record mode, it switches to the alarm record encoding rate and sends images from the camera associated with the alarm on a priority basis along with images from the camera selected in one camera record mode.

The Simplex processes multiple alarms in the order they occur. All alarms are identified by flashing **CAMERA** button LEDs and receive priority for output to the VCR.

The Simplex remains in the alarm state until ALL of the following occur:

- All mechanical alarms are released.
- The ALARM DURATION time elapses.
- The Alarm Hold Input is released.

Once the Simplex exits the alarm state, it returns to the previous display and record mode.

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Tape Playback Mode Alarm Response	When the Simplex system is in tape playback mode, only the call monitor responds to live alarm events by displaying the associated camera. The Simplex sends nothing to the VCR, does not display graphic messages, and does not flash the LEDs.
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**RECORDED ALARMS** The Simplex must be in tape playback mode to display and process recorded alarms. The Simplex detects recorded alarm events by monitoring the VIS information returned from tape. Each field of recorded video is encoded with alarm status information, camera number, camera title, time and date. The Simplex uses this information to identify camera related alarm events.

When the recorded alarm is detected in tape playback mode, the following events occur:

1. The associated **CAMERA** LED flashes.
2. The system overlays the video image of the associated camera with an ALARM or VIDLOSS graphic.

Multiple alarms are processed in the order in which they occurred.

The Simplex can detect recorded alarm events at any playback speed (including forward and reverse search on many VCRs). When a tape is played at the speed it was recorded, the duration of each alarm is the same as the original event. Other tape speeds can be used to speed up or slow down alarm playback.

**VIDEO LOSS ALARMS** The Simplex system can detect loss of the video signal at any connected camera input. It does so by detecting the loss of the video sync signal. The VIDEO LOSS ALARM menu option controls this feature. When this option is **ON** (the default), the system responds to the loss of camera video with a blinking LED above the **CAMERA** button and displays the VIDLOSS message on the main monitor.

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## Chapter 7 — Special Applications

The features and flexibility of the Simplex make it a powerful tool in special applications where unique capabilities are required. This section describes several ways to use the Simplex.

### MULTIPLEXED VIDEO TRANSMISSION

Two Simplex systems can be employed to transmit video from multiple cameras over a single video communication link. The link may be coaxial cable, a microwave channel, or other mediums that support real-time video. Multiplex video transmission requires that one Simplex system be installed at each location.

A multiplexed video link allows you to display either local or remote cameras at one site.

### One-Way Video Transmission

One-way multiplexed video transmission requires two Simplex systems and one video quality communication link. The link joins the **vcr out** connector at Site A to the **vcr in** connector at Site B. It is important to keep the Simplex at Site A in record mode so that images are sent. Site A cameras can be viewed at Site A and Site B. Site B can view either local cameras (Site B, LIVE display mode) or the cameras located at Site A (PLAYBACK display mode). See *Figure 3 — One-Way Multiplexed Video Transmission*.

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**REMOTE CONTROL** The Simplex provides two methods of remote control, a Remote Control Panel option, or using an ASCII terminal or computer to send RS-232 data. Both methods use the rear panel **remote in** and **remote out** connectors.

**Remote Control Panel** A Remote Control Panel option is available for the Simplex. It consists of a front panel assembly, a desktop stand, rack mount brackets, and a 50 foot cable. Remote panel operation is identical to that of the local panel and control can be exercised from either panel.

Up to 16 Simplex units can be daisy chained to a Remote Control Panel, but only one Simplex can be controlled at a time. You can change which Simplex you control by pressing FUNCTION and CALL on the Remote Control Panel. When the 16 LEDs above the CAMERA buttons on the Remote Panel light, press the CAMERA button for the next Simplex to control. The CAMERA button numbers are used in the same order as the Simplex units are connected to the Remote Control Panel. If you press CAMERA 16, you select the 16th connected Simplex. For details see *Operating the Panel* in the *Remote Control Panel* manual.

For more information about this option, contact your dealer or Factory Technical Support.

## APPENDIX A ALARM CONNECTOR PIN ASSIGNMENTS

The **alarms** connector is a DB37-S. It accepts a DB37-P mating connector. Connect ground wires to the **gnd** screw (next to the **alarms** connector).

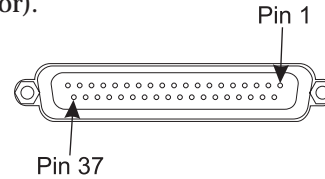


Figure 8 — Alarm Connector

PIN	PIN ASSIGNMENT	PIN	PIN ASSIGNMENT
1	Alarm input 1	20	Alarm output 1
2	Alarm input 2	21	Alarm output 2
3	Alarm input 3	22	Alarm output 3
4	Alarm input 4	23	Alarm output 4
5	Alarm input 5	24	Alarm output 5
6	Alarm input 6	25	Alarm output 6
7	Alarm input 7	26	Alarm output 7
8	Alarm input 8	27	Alarm output 8
9	Alarm input 9	28	Alarm output 9
10	Alarm input 10	29	Alarm output 10
11	Alarm input 11	30	Alarm output 11
12	Alarm input 12	31	Alarm output 12
13	Alarm input 13	32	Alarm output 13
14	Alarm input 14	33	Alarm output 14
15	Alarm input 15	34	Alarm output 15
16	Alarm input 16	35	Alarm output 16
17	Alarm output common	36	Alarm hold input
18	Alarm output NC	37	Autodetect VCR Speed
19	Alarm output NO		

Table 1 — Alarm Connector Pin Assignments

## APPENDIX B ALARM RECORDING CONTROL

Most installations require that alarm events be documented on videotape. The Simplex provides all of the necessary connectors and signals to accomplish this. The Simplex is compatible with virtually all VCRs and flexible enough to satisfy most video documentation requirements.

An alarm event begins when an active alarm signal is detected at the **alarms** connector. The sequence of events following alarm detection is determined by one or more of the following:

- Option settings
- VCR programming
- Connections between the Simplex and VCR

The following paragraphs describe uncontrolled or controlled alarm recording.

### Uncontrolled Alarm Recording

When alarm recording is not controlled, the VCR records cameras with active alarms at the normal rate. Since there is no alarm connection between the VCR and the Simplex, the VCR does not change recording speed when an alarm occurs. The VCR simply records alarm video output from the Simplex at the set time-lapse speed. Uncontrolled alarm recording requires only video connections between the Simplex and the VCR. Alarm connections are not required.

To set up the system for uncontrolled alarm recording:

1. Connect the Simplex **vcr in** connector to the VCR's video out connector and the Simplex **vcr out** connector to the VCR's video in connector.
2. Set the Simplex ALARM DURATION to the number of seconds you wish each alarm event to be recorded.
3. Set the VCR's time-lapse speed as desired.
4. Set the Simplex VCR RECORD TIME and VCR ALARM RECORD TIME options to match the speed set at the VCR.

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**Controlled Alarm Recording** When alarm recording is controlled by the Simplex, the VCR records cameras with alarm signals as alarm video. The recorder responds to the alarm signal provided by the Simplex system. It enters the alarm recording mode and changes to the alarm record speed. The VCR remains in the alarm mode until released by the Simplex. Controlled alarm recording requires both video connections and alarm connections between the Simplex and the VCR.

To set up the system for controlled alarm recording:

1. Connect the Simplex **vcr in** connector to the VCR's video out and the Simplex **vcr out** connector to the VCR's video in.
2. Connect a wire from the VCR ground to the Simplex **alarms** connector pin **17** (alarm output common).
3. Connect a wire from the VCR alarm input to the Simplex **alarms** connector pin **19** (if VCR alarm input polarity is active low) or pin **18** (if VCR alarm input polarity is active high).
4. Set the Simplex ALARM DURATION option to the number of seconds you wish each alarm event to be recorded.
5. Set the VCR's Alarm Duration option to MANUAL.
6. Set the Simplex VCR RECORD TIME option to match the VCR's normal recording speed.
7. Set the Simplex VCR ALARM RECORD TIME option to match the VCR's alarm recording speed.



## APPENDIX C IN CASE OF TROUBLE

If a problem occurs, review the section of the manual which covers the activity associated with the problem. If necessary, consult the *Troubleshooting Guide* on the following pages.

If the problem cannot be solved, you may have to contact your dealer or the factory. When you call for support, the representative will ask you to provide specific information about the installation. To save time, spend a few minutes getting organized before you telephone.

Before calling your dealer or Technical Support, write down the following information:

- The serial number of your Simplex.
- The make and model of each piece of hardware connected to the Simplex.
- Approximate date of purchase and of installation.
- The symptoms you have observed.

NOTE: Please do not return any product to the Factory without first obtaining a Return Authorization (RA) number. Failure to do so can result in a significant delay in processing your repair. To obtain an authorization number, contact Technical Support.

Sensormatic Video Products Division  
Technical Support  
+1 (619) 642-2400

TROUBLESHOOTING GUIDE		
PROBLEM	POSSIBLE CAUSES	SUGGESTED ACTION
Video Problems in Live Mode		
Live pictures too bright, too dark, bad color or bad contrast.	Monitor not correctly adjusted.	Adjust monitor using gray or color bars, as applicable.
	Termination not set correctly.	Check termination switches on back panel for each camera output.
Some live pictures too dark.	Camera iris is not correctly adjusted.	Adjust camera iris using calibrated monitor.
Some live pictures too light.	Some cameras are not terminated.	Check rear panel switches for each camera, set for 75 ohms.
	Camera iris is not correctly adjusted.	Adjust camera iris using calibrated monitor.
Black horizontal lines in picture, picture unstable.	Faulty camera sync or video output.	Replace affected camera with a known good camera.
One or more camera images do NOT change.	VIDEO LOSS ALARM set to <b>OFF</b> , or VIDLOSS message cleared before video loss is fixed.	Change display format, if camera window is blank, check video connections and camera.
Video Problems in Tape Mode		
Poor pictures, bad color, image unstable.	VCR faulty or requires maintenance.	Perform periodic maintenance and test VCR performance.
RECORDER STOPPED message on monitor.	Operator changing operating mode of unit.	For tape playback, press play on the VCR. To record, press the Simplex <b>RECORD</b> button and the VCR record button.

Table 2 — Troubleshooting Guide

TROUBLESHOOTING GUIDE		
PROBLEM	POSSIBLE CAUSES	SUGGESTED ACTION
Alarm Detection Problems		
No alarm message.	ALARM MESSAGE DISPLAY is set to <b>OFF</b> .	Set ALARM MESSAGE DISPLAY <b>ON</b> .
No response to a contact alarm input or continuous alarm when alarm input is connected.	Alarm not connected properly.	Check connections and correctly connect alarm.
	Alarm device polarity and multiplexer alarm input polarity do not match.	Change alarm device polarity or Simplex alarm input polarity.
Motion Detection Problems		
Important motion not detected.	Motion targets turned off.	Turn on motion targets where needed.
Unimportant motion detected.	Unnecessary motion targets turned on.	Turn off unneeded motion targets.
Motion detected when no motion occurred.	Camera is random interlace type, video is not stable or camera mounting is loose.	Replace camera or substitute another model to test. Check camera mounting.
Remote Control Problems		
No response to remote control panel. Remote control panel LEDs off, remote panel beeping.	Remote panel data cable plugged into Simplex <b>remote out</b> connector.	Plug remote panel data cable into Simplex <b>remote in</b> connector.
	Remote panel data cable loose.	Reconnect remote panel cable.
No response to remote control panel. Remote control panel LEDs off.	Remote panel power cable loose or not connected.	Check remote panel power cable connection.
No response to remote input.	Serial communications protocol not correct.	Configure remote device for 1200 bps, 1 start bit, 8 data bits, 1 stop bit, no parity.

Table 2 — Troubleshooting Guide (continued)

## APPENDIX D TECHNICAL SPECIFICATIONS

The following specifications apply to the American Dynamics Simplex only. American Dynamics reserves the right to revise and improve its products. All specifications are therefore subject to change without notice.

Operating Defaults	Record Function	ON
	Recording Status	REC ALL
	Alarm Message Display	ON
	Alarm Message Latch	OFF
	Video Loss Alarm	ON
	Alarm Input Polarity	ACT LOW
	Alarm Output Polarity	ACT HI
	Display Record Status	ON
	Quad Record Option (four-camera models only)	OFF
	Image Tenderizer	OFF
	VCR Record Time	24 hours
	VCR Alarm Record Time	24 hours
	Alarm Duration	4 seconds
	Global Dwell	2 seconds
	Camera Titles	Camera Number
Motion Setup Screen	All targets selected	
Security Lock	OFF	
Video Format	NTSC Color or EIA B&W	
	PAL Color or CCIR B&W	

Video Level	Camera Inputs	1.0 V p-p, 75 ohms
	Camera Outputs	1.0 V p-p, 75 ohms
	VCR Input	1.0 V p-p, 75 ohms
	VCR Output	1.0 V p-p, 75 ohms
	Monitor Output	1.0 V p-p, 75 ohms
Alarm	Camera Alarm Input	One input per camera. Activated by mechanical contact or TTL/CMOS active level.
	Alarm Hold Input	+5 to +15 VDC or TTL/CMOS active high.
	Alarm Duration	4 second default. Menu selectable from 1 to 999 seconds.
	Alarm Output	Normally open (NO) and normally closed (NC) contacts with shared common:  2.0 A at 30 VDC (resistive only)  1.0 A at 125 VAC (resistive only)
Display	Gray Shades	256 (8 bits)
	Colors	16,777,216 colors (24 bits)
	Full Screen Format (pixels)	512x464 (NTSC/EIA) 512x512 (PAL/CCIR)
	2x2 Format	256x232 (NTSC/EIA) 256x256 (PAL/CCIR)
	3x3 Format	170x154 (NTSC/EIA) 170x170 (PAL/CCIR)
4x4 Format	128x116 (NTSC/EIA) 128x128 (PAL/CCIR)	

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Controls	Soft touch, rubberized push buttons with indicator lights (LEDs).	
	Function	Used in combination with other buttons to access special functions.
	VCR view	Displays VCR output on main monitor.
	Sequence (Up arrow)	Provides full-screen sequenced image display. Scrolls up through available characters on setup menu.
	2x2 (Down arrow)	Provides a four-camera image display (quad). Scrolls down through available characters on setup menu.
	3x3 (Left arrow)	Provides a nine-camera image display. Selects previous option on setup menu.
	4x4 (Right arrow)	Provides a 16-camera image display. Selects next option on setup menu.
	Live	Enters live mode (display only, no recording).
	Tape	Enters tape playback mode.
	Record	Starts recording all cameras, cancels one camera recording.
	Call	Displays a full-screen camera image on the call monitor.
	Camera 1-16	Selects a camera for viewing or one camera recording.

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Connectors	Power	2.1 mm pin-type female. Power input.
	Remote in	RJ11. Remote Control Panel Option or control via RS-232 data.
	Remote out	RJ11. Use with Remote Control Panel for daisy chaining to another Simplex.
	Gnd	Ground screw.
	Alarms	DB37-S. Alarm control via contact closure or TTL/CMOS signal.
	Call Mon	BNC. Video signal output to call monitor.
	Main Mon	BNC. Video signal output to main monitor.
	VCR In	BNC. Composite video input from VCR.
	VCR Out	BNC. Composite video output to VCR.
	Cam In	BNC. Composite video input from camera.
Cam Out	BNC. Composite video output from camera (passive loop through).	
Electrical	Power Requirements	12 Watts (center positive 12 VDC) at least 1 Amp

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Physical Characteristics	Dimensions	17 in. (432 mm) Wide 12.25 in. (311 mm) Deep 1.75 in. (44 mm) High
	Unit Weight	9 lbs. (4 kg)
	Shipping Weight	11 lbs. (5 kg)
Environmental Requirements	Temperature	40–104°F (4–40°C)
	Humidity	5–95%RH noncondensing
	Altitude (operating)	0–10,000 ft. 0–3,048 meters
Options	Remote Control Panel	Includes front panel assembly, desktop stand, rack mount brackets, and 50 foot cable.