WARNING!

TO PREVENT FIRE OR ELECTRIC SHOCK,
DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

CAUTION!

RISK OF ELECTRIC SHOCK
DO NOT OPEN!

CAUTION! **TO PREVENT ELECTRIC SHOCK DO NOT REMOVE COVER. NO USER SERVICEABLE COMPONENTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

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.

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

CAUTION! ***Lithium Battery***

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

ATTENTION

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 or other possible recycling options.

CAUTION!

Electrostatic Sensitive Device!

Use proper CMOS and MOSFET handling precautions, including approved grounded wrist straps, etc., to avoid damage this unit or its internal components, from electrostatic discharge .

WARNING!

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 persuant 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.

Operation of this equipment in a residential area may cause interference, in which case the user is required to take all measures are necessary, at the user's expense, to correct the interference.

IMPORTANT SAFETY INFORMATION

- Read Instructions - All the safety and operating instructions should be read before the unit is operated.
- Retain instructions - The safety and operating instructions should be retained for future reference.
- Heed Warnings - All warnings on the unit and in the operating instructions should be adhered to.
- Follow Instructions - All operating and use instructions should be followed.
- Cleaning - Unplug the unit from the outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
- Attachments - Do not use attachments not recommended by the product manufacturer as they may cause hazards.
- Water and Moisture - Do not use this unit near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, near a swimming pool, in an unprotected outdoor installation, or any area which is classified as a wet location.
- Accessories - Do not place this unit on an unstable stand, tripod, bracket, or mount. The unit may fall, causing serious injury to a person and serious damage to the unit. Use only with accessories recommended by the manufacturer, or sold with the product. Any mounting of the unit should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.
- Ventilation - Openings in the enclosure, if any, are provided for ventilation and to ensure reliable operation of the unit and to protect it from overheating. These openings must not be blocked or covered. This unit should not be placed in a built-in installation unless proper ventilation is provided. Do not place directly on other hot equipment that may increase its operating temperature.
- Power Sources - This unit should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply you plan to use consult your appliance dealer or local power company. For units intended to operated from battery power, or other sources, refer to the operating instructions.
- Grounding or Polarization - This unit may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.
- Alternately this unit may be equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.
- Power-Cord Protection - Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
- Power Lines - An outdoor system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outdoor system, extreme care should be taken to keep from touching such power lines or circuits. When installing an outdoor system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.
- Overloading - Do not overload outlets and extension cords as this can result in a risk of fire or electric shock.

- Object and Liquid Entry - Never push objects of any kind into this unit through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the unit.

- Servicing - Do not attempt to service this unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

- Damage Requiring Service - Unplug the unit from the outlet and refer servicing to qualified service personnel under the following conditions:

a) When the power-supply cord or plug is damaged.
b) If liquid has been spilled, or objects have fallen into the unit.
c) If the unit has been exposed to rain or water.
d) If the unit does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage, or void the warranty, and will often require extensive work by a qualified technician to restore normal operation.
e) If the unit has been dropped or the cabinet has been damaged.
f) When the unit exhibits a distinct change in performance, this indicates a need for service.

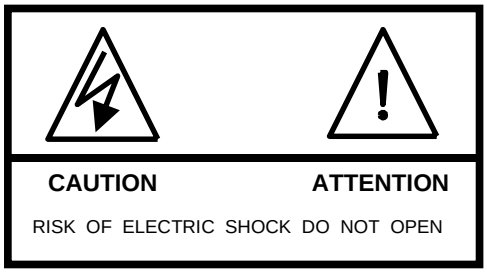
- Replacement Parts - When replacement parts are required be sure the service technician has used replacement parts specified by the manufacturer or that they have the same characteristics. Unauthorized substitutions may result in fire, electric shock or other hazards.

- Safety Check - Upon completion of any service or repairs to this unit, ask the service technician to perform safety checks to determine that the unit is in proper operating condition.

- Coax Grounding - If an outside cable system is connected to the unit, be sure the cable system is grounded. Lightning - For added protection of this unit during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the cable system. This will prevent damage to the unit due to lightning and power-line surges.

SAFETY PRECAUTIONS

TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT OPEN COVERS. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This label may appear on the bottom of the unit due to space limitations.

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

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

Lithium Battery Warning / Lithiumbatterien

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

WARNING: Electrostatic-sensitive device.

Use proper CMOS/MOSFET handling precautions to avoid electrostatic discharge.

NOTE: Grounded wrist straps must be worn and proper ESD safety precautions observed when handling the electrostatic-sensitive printed circuit boards.

UNPACKING

The shipping carton is the safest container in which the unit may be transported. Save it for possible future use.

EMISSIONS

The equipment complies with CE class A and to part 15 of the FCC rules for emissions, class A.

SERVICE

If technical assistance is required, please contact our Technical Support Engineer at 800-526-5308, extension 5234. (Monday through Friday, 9:00 am – 5:00 pm EST excluding holidays).

If the unit ever requires factory service, the customer should:

A. Pack the product carefully, preferably in the original carton,
B. Include a copy of your bill of sale,
C. Include a detailed letter of explanation of the problem,
D. Ship prepaid and insured to the following address:

JVC Professional Service
705 Enterprise Street
Aurora, IL 60504-8149
630-851-7855 Voice
630-851-0036 Fax

Refer to the SERVICE section in this manual.

Passwords

This page contains the system passwords. It is recommend that, for system security, you remove it from the manual and store it in a safe place.

The initial password, supplied with the unit for the Operator menu system, is:

Password 1, 

The password for the Installer menus is:

Password 2, 1 2 3 4

The password for resetting your multiplexer to the factory settings is:

Password 3, 8 1 1 1

You should change the password for the menu systems (passwords 1 & 2) and record it below for future reference.

Password 1.

_____

Password 2.

_____

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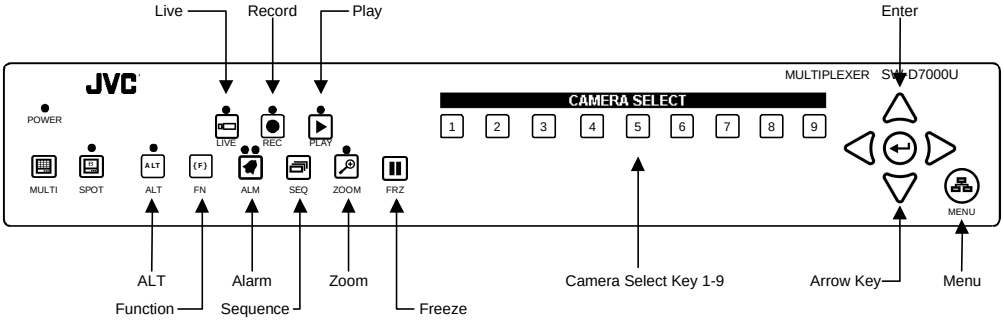
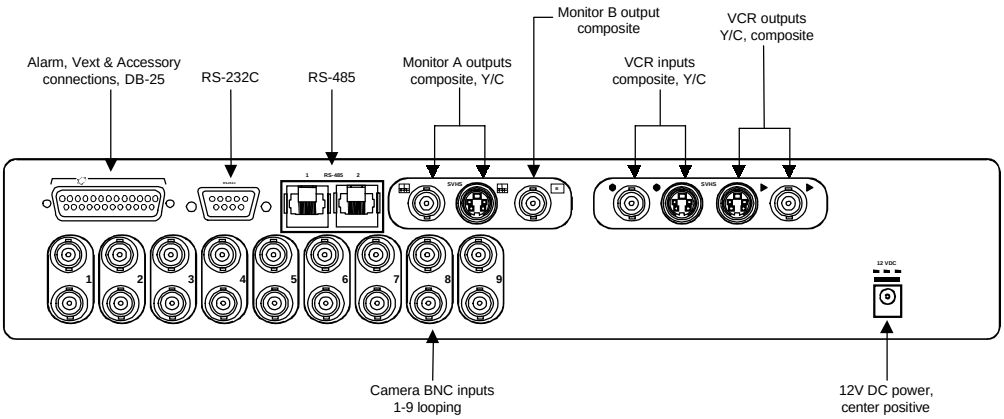
CONTROLS AND INDICATORS

FRONT PANEL CONTROLS



REAR PANEL CONNECTIONS



1.0 INSTALLATION INSTRUCTIONS

1.1 UNPACKING

Keep the original packing of use when the unit has to be stored or transported. The packaging should contain the following items;

- The multiplexer unit
- A power supply
- Instruction Manual

Be sure to check the unit for signs of damage. If damage has occurred, please contact the supplier and the delivery service immediately. Do not attempt to use the unit.

1.2 ASSOCIATED EQUIPMENT

A typical system, using this multiplexer, could contain the following components;

- Two monitors
- Recorder
- Security Cameras with 1Vp-p composite video outputs
- 75 ohm BNC connectors and video coaxial cable for connecting the video signals

1.3 LOCATION

Make sure your AC power supply outlet is stable and within the rated voltage of the external DC 12V power supply provided with the unit. If the site's AC power is likely to have spikes for power drops, use power line conditioning or uninterruptable powers supply (UPS).

Ventilation:
Make sure that the location planned for the installation of the unit is well ventilated. Locate the cooling vents in the unit enclosure and make sure they are not obstructed in the installation.

Temperature:
Make sure to check the ambient temperature specifications of the unit and insure that the location of installation is within these specifications. Extremes of heat or cold outside of the specified limits may cause the unit to fail. Do not install the unit near hot equipment.

You can place a monitor on top of the unit if it weighs less than 35lbs (16kg)

2.0 PRODUCT DESCRIPTION

This manual describes the installation, operation and programming of the SW-D7000U color duplex multiplexers.

The *SW-D7000U* multiplexer is designed as a *color* video record and Playback system. This unit allows the simultaneous recording of multiple camera inputs on a security recording devices. Live video inputs and recorded video when Played-back can also be viewed in several different multi-screen configurations. The units contain dual digital video processors so that multiplexed recording can always take place, even during Live mode multi-screen displays or during Playback of previously recorded multiplexed signals.

SW-D7000U, 9CH. COLOR VIDEO MULTIPLEXER

The *SW-D7000U* is a single integrated unit, housed in a 19" rack-mountable enclosure. The front panel contains all operator control keys and indications, while the looping video inputs, the video outputs, the alarm inputs and outputs, and the remote control connectors are housed on the rear panel. It has DC 12V power and is supplied with an external AC power supply.

The *SW-D7000U* has two monitor outputs, designated Monitor-A and Monitor-B.

- Monitor-A is used for multi-screen, *digital* images that can be frozen and zoomed.
- Monitor-B is a full-screen, Live, analog output. Monitor-B is sometimes referred to as a '*spot*' monitor in the security industry.

The *SW-D7000U* includes many advanced features:

- Easy setup and programming using modern style on-screen menus
- Menu adjustable camera AGC (automatic gain control)
- High quality color definition – CCIR 601 4:2:2 YUV
- S-VHS to Monitor-A
- Automatic video input termination
- VEXT VCR clock input for automatic synchronization to VCR speeds
- Activity/Motion detection
- Multiple Alarm inputs and outputs
- Motion Detection Sensitivity Scope for simplified set-up
- "Covert" Camera setting
- Conditional Live Display
- AutoList™ simplified sequence programming
- 2X digital zoom and digital pan & tilt – Live & Playback
- Alarm history log
- Operator programmable macro function keys
- A scheduler to automatically start macros at preset times, days or dates
- A simple Summer/Winter time change function
- Remote programming (upload and download)
- Remote control using optional keyboard or PC
- Optional Pan Tilt and Zoom controls
- Ability to decode tapes recorded on multiplexers manufactured by Dedicated Micros, Robot and Calibur, allowing existing DM and Robot sites to upgrade to the advanced features of the SW-D7000U multiplexers

WARNING!

The primary purpose of the SW-D7000U is efficient video multiplexing and multi-screen display. Alarm handling and motion detection are secondary functions. National standards relating to alarm equipment should be taken into account when choosing equipment to use with the SW-D7000U. In general, the SW-D7000U multiplexer should not be the only alarm device on the site.

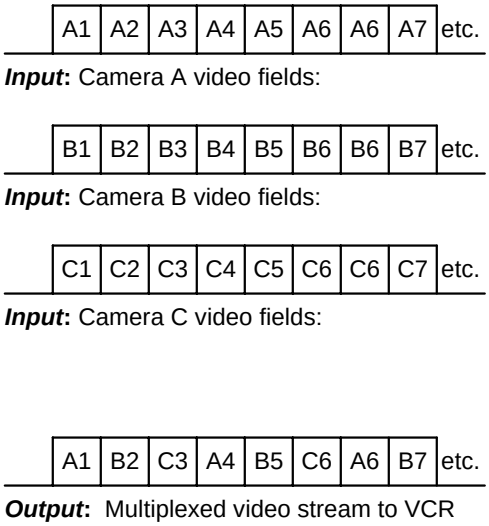
How multiplexed recording works:

To record several camera inputs on one video output, 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. The time slicing of several inputs onto one output is generally known as Time Division Multiplexing

(TDM). Time base correction is performed during digital capture and so input cameras need not be synchronized.

The order in which the fields are captured from the different input cameras is controlled by an operator-programmed RECORD LIST, which can be automatically modified by the system in the event of alarms or motion detection. The multiplexed video fields can then be recorded onto a single VCR via the VCR output connector.

Example: 3 multiplexed inputs:



In addition to the video content sent to the VCR in each field, a packet of digital data that uniquely identifies the field is inserted into each field sent to the VCR. (This packet data is not visible in the normal video and is used in the Playback mode to recognize incoming fields and to link them back to the original camera input from which they were captured.)

Besides the camera number, other status information stored in this packet of digital data includes time and date, camera status, camera title, selected record time mode information as well as system and alarm status at the time of recording. This status information is rebuilt and displayed with the corresponding camera during Playback. On Playback the operator can select one of several screen formats for display, and can also choose which cameras to display in which position in a multi-screen.

NOTE: The *SW-D7000U will* ***NOT*** set the VCR speeds which must be set up separately on the VCR.

How Playback works:

When Playing back multiplexed recordings which were originally recorded from a *SW-D7000U* compatible multiplexer, time stamped video fields are received from a VCR connected to the VCR input connector or Y/C input on the *SW-D7000U's* rear panel, each field being uniquely identified by its own digital data packet. These embedded digital data packets are decoded, and the video field is linked to its original input camera.

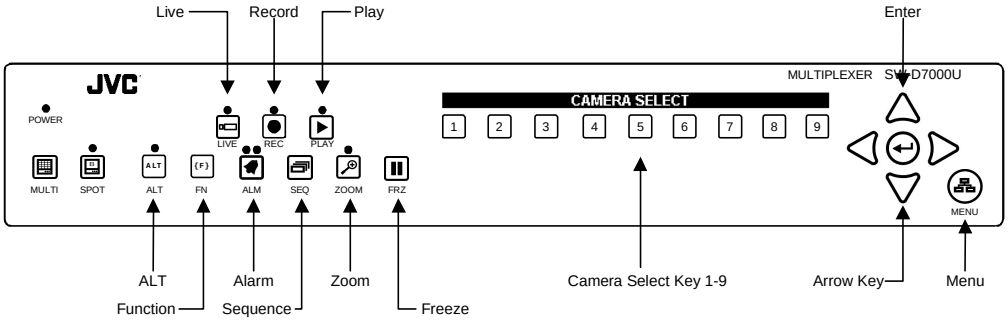
The operator can select which cameras to display during Playback, and so the video field for that camera is displayed (or skipped) according to the operator's Playback selection. All the associated status information, including titles, time and date of recording, as well as the alarm or video loss status of the camera is reconstructed from the digital data packet and displayed as on-screen text during Playback. Because the on-screen text is re-constructed and generated for on-screen display (as opposed to being recorded on the VCR as part of the video display) the operator is assured of very clear and legible status and titles during Playback.

2.1 FRONT PANEL CONTROLS

The front panel contains all the operator control keys and indicators, while the video inputs, video outputs, alarm inputs and outputs, and the remote control connections are on the rear panel.

The unit has DC 12V power and is supplied with an external AC power supply

FRONT PANEL CONTROLS



2.2 CONNECTIONS

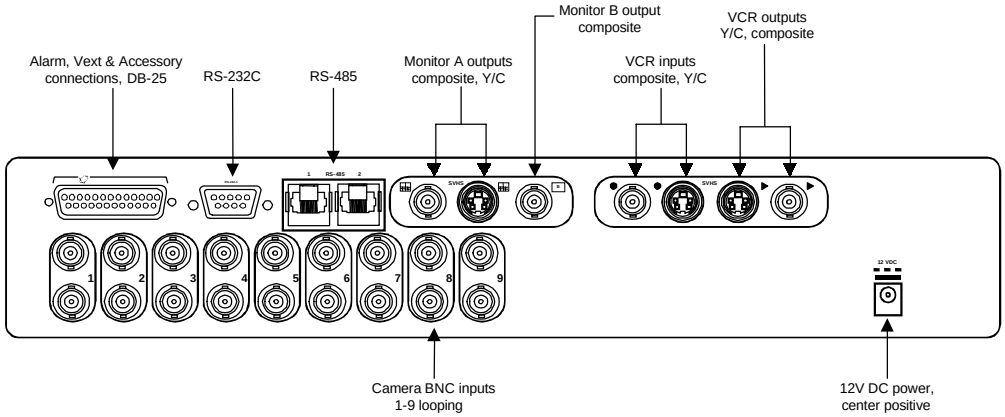
The following instructions relate to the multiplexer only. Refer to the relevant instructions for the associated equipment.

All the connectors are on the back-panel of your multiplexer as shown below. These connectors are:

- 9 Loop-through camera inputs with automatic termination
- Monitor outputs for Monitor-A (BNC and S-VHS) and Monitor-B (BNC)
- VCR input and output (BNC or S-VHS)
- 9 alarm inputs (25 pin D-sub) each of which can be normally open (NO) or normally closed (NC)
- RS232 and RS485 connections

The 25 pin “D-sub” connector also has the contacts for the two alarm output relays and VEXT input. The VEXT input accepts a synchronizing pulse from your VCR (see VCR instructions). This allows the multiplexer to follow, automatically, the time lapse speeds of the VCR if they change due to manual changes or alarm activity.

REAR PANEL CONNECTIONS



NOTE: Do not use locked type S-video cable.

2.3 CAMERA INPUTS

Use 75 ohm BNC connectors and video coaxial cable to connect to the camera input BNC sockets on the back of your multiplexer.

For each camera input, there are two BNC sockets, one for the camera input and one for the looped camera signal. If you connect to both BNC sockets your multiplexer automatically removes the 75-ohm termination. If using the loop-through facility, make sure that your ultimate connection point (e.g. A monitor or VCR) provides a 75-ohm termination at the end of the line. If you do not use the loop-through output the multiplexer will automatically terminate at the input BNC.

Connect your 9 camera inputs. If you have less than 9 cameras, you can disable individual camera inputs in the menu system, see CAMERA ENABLE/DISABLE.

2.4 VCR CONNECTIONS

This connection consists of a video and VEXT input (25 pin D-sub) connections. For an S-VHS VCR, use 4-pin mini-din S-VHS connectors.

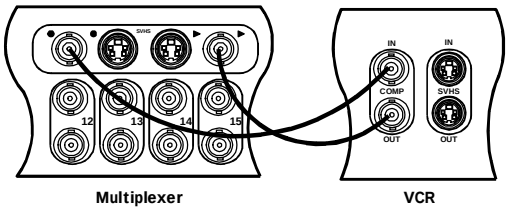
For a standard VCR use 75 ohm coaxial cable and BNC connectors.

NOTE: Do not use locked type S-video cable.

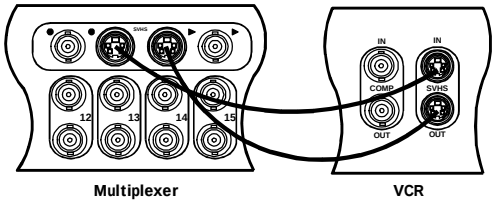
If you are using S-VHS, then for full benefit, you must also select S-VHS in the VCR SETUP menu. Although the VEXT connection is optional, it is a good way to simplify the operation of your multiplexer because it automatically synchronizes your VCR to your multiplexer. If using the VEXT input, the SWITCH INPUT option must be used in the VCR SETUP menu.

NOTE: Some time-lapse VCR's do not transmit a VEXT signal in real time mode (2 hour NTSC/EIA). In these cases, if you are using the VEXT input, select the same recording speeds in both the Alarm Record Speed and Normal Record Speed menu settings in the RECORD OPTION in the MAIN MENU.

Composite Video VCR Connections



SVHS or Y/C VCR Connections



Refer to the specific instructions provided with your VCR and connect the multiplexer's Record output to the VIDEO IN connector on your VCR and the multiplexer's Play input to the VIDEO OUT connector on your VCR. The drawings above are illustrative of typical multiplexer to VCR connections.

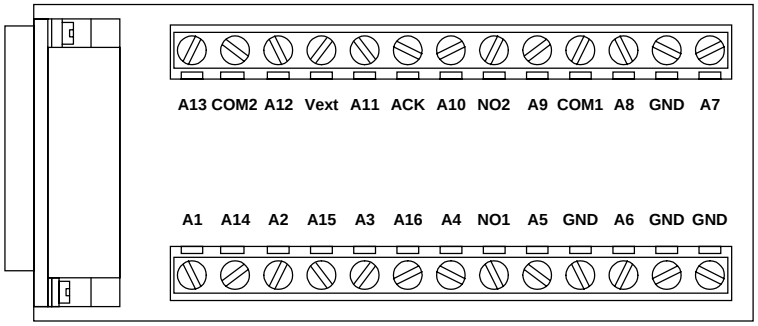
NOTE: Both standard (Composite) and S-VHS VCR connections cannot be used at the same time. Select either standard or S-VHS connections depending on the VCR used.

2.5 MONITOR CONNECTIONS

For Monitor-A (multi-screen), hook-up to the Monitor-A BNC connector, using a 75 ohm coaxial cable. Connect the other end of the cable to your monitor. For Monitor-B (spot), hook-up to the Monitor-B, BNC connector, using a 75-ohm coaxial cable. Connect the other end of the cable to your monitor.

2.6 ALARM INPUTS AND OUTPUTS

Use the supplied 25 pin D-Sub M connector or interface PCB, wired according to the following instructions. Do not wire directly to the 25 pin D-sub connector on the multiplexer back panel.

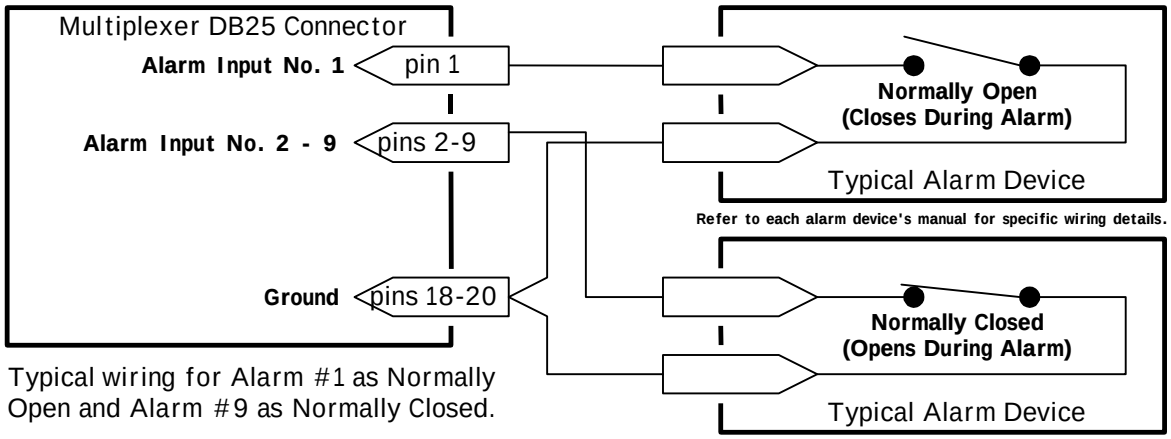


This drawing shows the Alarm I/O PCB supplied with the unit. This wiring interface greatly simplifies all alarm and VCR connections to the unit.

PIN NO. (PCB Location)	CONNECTIONS
Pins 1 to 9 (A1-A9)	Alarm inputs 1 to 9
Pin 17 (NO1)	Alarm output 1 – Relay #1 (selectable NO or NC)
Pins 18 to 20 (GND)	Ground connections – Alarms and VEXT inputs
Pin 21 (COM1)	Alarm output 1 – Relay #1 common ground
Pin 22 (NO2)	Alarm output 2 – Relay #2 (selectable NO or NC)
Pin 23 (ACK)	External Alarm clear (pull to ground to clear)
Pin 24 (VEXT)	VEXT, VCR synchronization pulse
Pin 25 (COM2)	Alarm output 2 – Relay #2 common ground

2.7 ALARM INPUTS

Each alarm input can be triggered by a relay contact from devices such as smoke detectors, passive infrareds (PIR), pressure pads etc. (refer to the relevant instructions). The alarms are disabled while the menu system is active.

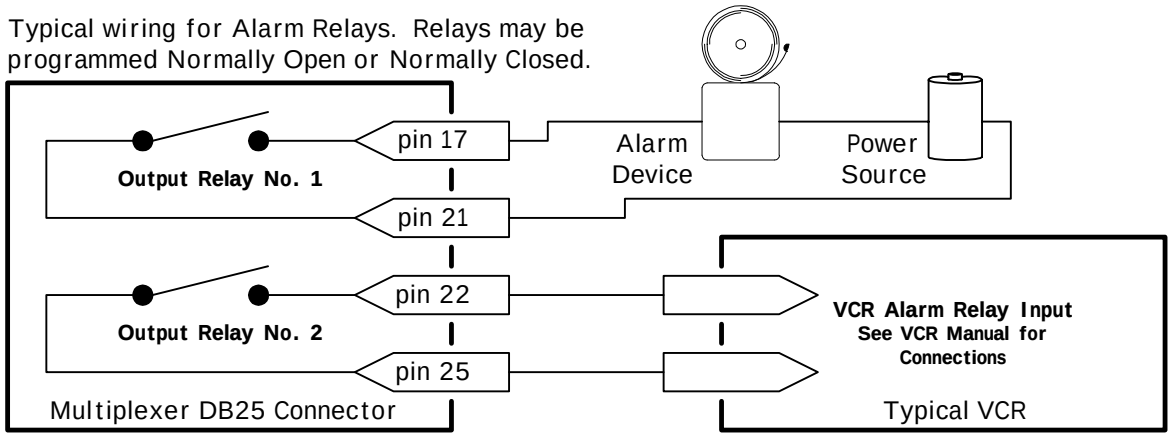


Typical wiring for Alarm #1 as Normally Open and Alarm #9 as Normally Closed.

2.8 ALARM OUTPUTS

NOTE: Do not exceed AC/DC 30V, 500mA on an alarm output relay. These outputs must not be used for power source.

Typical wiring for Alarm Relays. Relays may be programmed Normally Open or Normally Closed.



The alarm output relays can be programmed in the menu system to respond to macro functions, alarms and video loss. Connect your application to the alarm output relays (resistive loads only).

External Alarm Clear

You can use the External Alarm Clear to clear alarms by connecting it to ground on pins 18, 19 and 20. Clearing an alarm only clears the LED and the keyboard buzzer. The alarm output relay will follow the programming of the alarm input, which can be transparent, latched or timed-out. Refer to ALARMS menu programming

2.9 VEXT INPUT

The VEXT input (camera switch input) is for connecting from the VCR to your multiplexer. The VCR uses it to tell the multiplexer each time it has recorded an image. The multiplexer then transmits the next image on its VCR record output (VIDEO IN on the VCR). This way the VCR controls the multiplexer's recording speed. Connect the VEXT input (Pin 24) and one of the grounds pins to your VCR.

This facility is often referred to as a camera switch output, Rec trigger output, or similar, (see your VCR instructions). It is especially useful on VCRs with dual recording speeds (alarm and normal) because the multiplexer will automatically follow.

NOTE: Some time-lapse VCR's do not transmit a VEXT signal in real time mode (2 hour NTSC). In these cases, if you are using the VEXT input, select the same recording speeds in both the Alarm Record Speed and Normal Record Speed menu settings in the RECORD OPTION in the MAIN MENU.

The VEXT input accepts:

- TTL, field synchronized, negative going pulse, duration 2-5ms
- HIGH level, +4.5V to +5.5V
- LOW level, 0V

The multiplexer can be set to trigger off the negative or positive going edge (VEXT Pulse Edge in the RECORD menu).

NOTE: On power up, the auto-detection circuit will wait about 15 seconds to check if the VCR starts to output a switch pulse. The period of 15 seconds is approximately the period between switch pulses when the VCR is running in 960-hour mode. During this brief time the multiplexer will not switch cameras at all unless a switch pulse is detected. If the switch pulse ceases, the multiplexer will also take about 15 seconds to determine that it has in fact stopped and not just changed to 960-hour mode.

2.10 POWER

The multiplexer is supplied with a DC 12V class 2 output; AC 240 or 110V ±10%, 50 or 60Hz, input, external power supply. Its maximum power consumption is 40W.

DO NOT use any other power supply.

DO NOT connect the power until you have read the section Power Up and Tests in Section 4.1.

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

3.0 LIVE MODE OPERATION

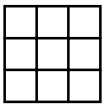
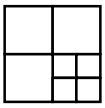
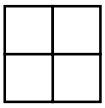
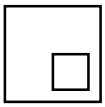
To select the Live mode, press the **LIVE** key.

In Live mode, Monitor-A displays multi-screen images of several cameras in formats selected by the operator. Images on Monitor-A are digital, and can be in multi-screen, in freeze or zoom. Images on Monitor-B are not digital. Regardless of the mode selected, Monitor-B only displays Live full-screen images of one camera.

3.1 MONITOR DISPLAY MODES

3.1.1 MULTI-SCREEN DISPLAYS ON MONITOR-A

To select different multi-screen displays press the **MULTISCREEN** key on the front panel. Each time the key is pressed, a new multi-screen format is selected. The order in which the multi-screens will appear each time the MULTISCREEN key is pressed is as follows:

			
9 - WAY 3 X 3	7 WAY ✷	QUAD 2 X 2	PIP 1 in 1

✷ The 7-way screen formats are not available in Play mode

Sequencing in cameos:

Press the **SEQ** key while in the Live multi-screen to automatically sequence all undisplayed cameras in the lower right cameo. (No menu setup is required. The cameo sequence list cannot be edited.)

Multi-screen Dwell time:

The multi-screen dwell time can be selected in the SEQUENCING sub-menu on the OPERATOR menu.

Automatic multi-screen format memory:

If the operator switches from a multi-screen display to a full-screen camera image, then when the **MULTISCREEN** key is next pressed, the operator will automatically return to the last multi-screen format that was being viewed. For example; the operator is viewing a 7-way multi-screen and switches the display to a full-screen display. If the **MULTISCREEN** key is pressed later the Monitor-A display will switch directly back to the 7-way screen format.

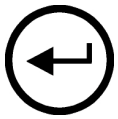
3.1.2 CHANGING CAMERAS IN MULTI-SCREEN DISPLAYS

Any camera can be displayed in any position in the *SW-D7000U* multi-screen displays. The default multi-screen displays show the cameras in ascending order. In the Live mode, the operator can display one camera in more than one position, while in Play mode each camera can be displayed once only on each multi-screen.

To select any camera for display in any cameo in a Live multi-screen, the *SW-D7000U* uses the concept of "*Active Cameos*".

Selecting the active cameo mode:

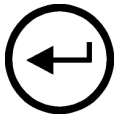
Press the ENTER key while displaying any multi-screen. The top left cameo will be the initial active cameo.



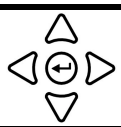
The active cameo is indicated by flashing the camera number and its title.

To End Active Cameo mode:

The active cameo mode will stay active 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 will also stop immediately if a new multi-screen display is selected, or if the operator switches between Live, Play, and Record mode.



Key functions during ACTIVE CAMEO mode:

	KEY	FUNCTION
	Arrow keys	Moves the active cameo around the multi-screen.
	Camera keys Labeled (**1** to **9**)	Selects a camera to display in the active cameo. The active cameo will auto-advance to the next logical cameo on the right so the operator can easily enter cameras in several cameos without using the arrow keys.
	FREEZE key	Freezes the cameo.
	ZOOM key	Switches to a full-screen display of that camera. *This will cancel active cameo mode*.

Notice that if the ZOOM key is pressed with no active cameo selected, then the display will switch full-screen to the camera displayed in the top left cameo.

NOTE: Display formats are operating parameters, not menu selections, and so they are saved in volatile memory and not in battery backed-up memory.

3.1.3 FULL-SCREEN DISPLAYS ON MONITOR-A

Fixed Full-screen display:

A full-screen display of any camera is selected on Monitor-A by pressing the corresponding camera key.

Full-screen Sequence list:

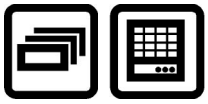
There are independent sequences, which operate on Monitor-A and Monitor-B. Refer to the AutoList™ feature below.

To start full screen sequencing on Monitor-A:

Select any full screen display by pressing the camera number, and then press the SEQUENCE key.

To stop full screen sequencing on Monitor-A:

Press SEQUENCE again, or press any camera key, or press the MULTISCREEN key.



Resolution of Full-screen displays:

The operator can switch the resolution of digital full-screen displays from 'frame' displays to 'field' displays. The lower resolution 'field' displays can result in less '*flickering'* on some high contrast camera scenes. Frame resolution is fully interlaced and provides higher resolution. See FIELD/FRAME SETUP in the OPERATORS menu.

NOTE: This is a ***global*** system setting and *all* camera displays will be changed.

3.1.4 AUTOLIST™

The operator can easily change the DEFAULT of all camera sequencing by using the AutoList™ function. AutoList™ sequence lists exist for Monitor A, full-screen and Monitor B through E. An AutoList™ also exists for the PLAY mode. DEFAULT settings for the lists are all cameras included, dwell time taken from menu. The DEFAULT dwell time is 3 seconds.

An AutoList™ recording is started in full-screen mode (LIVE or PLAY) by pressing ALARM and SEQUENCE keys simultaneously. Then select cameras in order of the sequence desired and at time desired for individual dwell times. Press the SEQUENCE key to stop recording of the AutoList™. Dwell times of up (time between key presses) to 30 seconds are allowed. A maximum of 32 cameras may be put into an AutoList™.

Pressing any key other than a valid camera key or the SEQUENCE key during recording will void the AutoList™. To return to the DEFAULT of all cameras included in the sequence list, with a fixed menu programmed dwell time, go to the SEQUENCING menu and change the dwell time.

NOTE: The AutoList™ will be erased whenever the FULLSCREEN DWELL setting is selected in the SEQUENCE menu. All Monitor sequences will default to the FULLSCREEN DWELL setting with all cameras consecutively sequenced.

3.1.5 PIP DISPLAY: SIZE AND POSITION

The PIP (picture-in-picture) display on monitor-A can be displayed in one of three sizes, and it can be displayed in one of two positions.

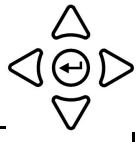
Size selection:

The sizes can be 1/4, or 1/9 of full-screen.

Position selection:

The PIP can either be displayed on the lower right hand side of the display, or else on the top left-hand side of the display.

Changing the PIP size and position:



Select the multi-screen for PIP on Monitor-A. Using the arrow keys changes the PIP size and position. The up/down arrows will change its position, and the left/right arrows will change its size, left being smaller and right being larger.

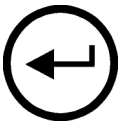
3.1.6 CHANGING POSITIONS AND COLORS OF TITLES

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

To change the position and color of the title for any camera:
Select a full-screen view of that camera on Monitor-A, and then press ENTER several times to toggle the title position and color. The operator can select one of seven options for each camera.

The following cycle will be followed as the ENTER key is pressed:

- Top, black
- Top, gray
- Top, white
- Bottom, black
- Bottom, gray
- Bottom, white
- Do not display this camera title
- Repeats from top…



NOTE: This setting affects only the Monitor-A display. Text on the Monitor-B display is not moved.

3.1.7 MONITOR-B DISPLAYS

Monitor-B is a full-screen, analog switching display of the Live input cameras. It displays only full-screen, Live images, regardless of the mode selected. The operator can select a fixed display of any one camera on Monitor-B, or a sequenced display of several cameras.

Monitor-B Sequence list and Dwell time:
There are independent sequences, which operate on Monitor-A and Monitor-B. Refer to the AutoList™ feature.

To operate on Monitor-B:
Press the MONITOR-B key first. The LED by the key will light until the MONITOR-B key is pressed again. While the LED remains lit, the camera keys and the SEQUENCE key will operate on Monitor-B and not on Monitor-A.

To select a camera full-screen on Monitor-B:
Press the camera number key while the Monitor-B LED is on.

To start Monitor-B sequencing:
Press the SEQUENCE key while the Monitor-B LED is on.

To stop Monitor-B sequencing:
Press SEQUENCE again, or press a camera number to select a fixed display on Monitor-B, while the Monitor-B LED is on.

3.2 RECORDING

In Record mode, single fields from up to 9 video input channels are assembled to form a continuous multiplexed video signal, which can then be recorded on a VCR according to a pre-programmed recording list.

Each recorded field is uniquely identified and linked to its input camera source by coded digital data that is automatically inserted into the time-sliced video field. Time/date and camera status information is also included in the coded data within each field. This coded data is used to provide comprehensive status and camera identification information during later Playback of recorded signals.

Record mode is always active. It is not necessary to press the RECORD key.

3.2.1 MONITOR OUTPUTS IN RECORD MODE

Monitor-A Output while recording:

The operator can select either the Live or Play mode while recording is taking place. The operator can select any desired Monitor-A multi-screen function as previously described in Section 3.0. In Play mode, images on Monitor-A are from the VCR tape recording when the VCR is in Play mode. If the VCR is not in Play mode, then the images on Monitor-A are from the VCR output of the *SW-D7000U*, not recorded images.

Record Speed Indicator on Monitor-A:

During recording, the *SW-D7000U* indicates the speed at which it is recording on Monitor-A. It uses the same time-format for the indicator as is generally used by time lapse VCRs. For example, **R024** will be displayed to indicate that the unit is **R**ecording in **24** hour mode. (If the VCR VEXT input is active, then **R EXT** will be displayed.)

Monitor-B Output while recording:

Monitor-B always displays analog Live, full-screen images of the camera inputs, regardless of which mode is selected.

3.2.2 ALARM DISPLAYS IN RECORD MODE

Alarm displays will conform to the Live or Play modes of operation. See Section 3.4 for further details on alarms.

3.3 PLAYBACK

Play Mode:

To enter Play mode, press the PLAY key.

Play mode will initially always stop any Live mode multi-screen displays on Monitor-A. Monitor-B always displays full-screen Live displays and hence will not be affected if Play mode is selected.

The *SW-D7000U* video multiplexer can display video Played back from a VCR whether it was originally recorded from a multiplexer, or whether it was recorded from normal video input, (i.e. not multiplexed).

The *SW-D7000U* can also correctly interpret tapes encoded on Dedicated Micros, Robot, or Calibur multiplexers, by changing an operator selectable option in the OPERATOR sub-menu PLAYBACK FORMAT. This is useful in installations that already have other multiplexers.

3.3.1 PLAY MODE: MONITOR-A DISPLAYS

Monitor-A Multi-screen display formats:
When Playback is first started, the unit will select a 7-way multi-screen display on Monitor-A, which shows all cameras that were recorded on that tape.

To select a different multi-screen:
Press the MULTISCREEN key. To select different cameras in a multi-screen, use active cameo setup (see 3.1.2). This can be used, for example, to Play back cameras 4, 5, 7 and 9 in a quad display, which is at the best resolution for four cameras simultaneously.

During Play mode, the operator can select the multi-screen formats that are available in Live mode, except for 7-way displays.

Full-screen displays:
To select a camera for full-screen Playback on Monitor-A during the Play mode, push the corresponding camera key once. A full-screen display of that camera from tape will be displayed full-screen.

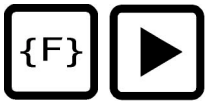
If tapes cannot be decoded:
If the *SW-D7000U, MULTIPLEXER* cannot decode a tape that is being Played back, the system will display a blank screen. The fields will not be decoded or separated.

There are two possible reasons why a tape cannot be decoded:

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

In the event that the tape was actually recorded on either a *SW-D7000U* compatible multiplexer, a Dedicated Micros or Robot or Calibur multiplexer, but is not correctly decoded, first check to see that the correct PLAYBACK FORMAT has been selected in the menus. See the OPERATOR MENU item in this manual.

To view tapes which were not decoded:
With the VCR Playback a tape, press FUNCTION then PLAY (see 3.6.4) to view the undecoded input. It should be clear from the undecoded Playback video if the video is multiplexed or not, as several camera images will be overlaid on each other.



3.3.2 PLAY MODE: MONITOR-A INDICATIONS

During Playback, the on-screen text '**P**' indicates the unit is in the Play mode.
The speed at which the data *was recorded* is displayed after the '**P**' (e.g. **P002** or **P024**).

If the recording was made using the camera switch input (VEXT), then the mode and speed indicator will read **'P EXT'**. The time and date is displayed on-screen during Play mode.

NOTE: This is the time recorded on the tape, not the current system time.

The indicator **'V'** will be displayed in the corresponding camera cameo (**'VDL'** if full screen), if there was video loss at the time that the recording was made.

NOTE: Any camera which is not detected on tape for 8 or more consecutive cycles during Playback, and is not flagged as a video loss camera, will result in the warning message **'N/A',** signifying that it is **N**ot **A**vailable. This is a warning message only, and can appear during Playback on full-screen or multi-screen formats on Monitor-A.

Several circumstances can cause the **'N/A'** indication:

- The camera may not have been included in the record list at the time of recording.
- The camera may have been disabled at the time of recording.
- The images for that camera on tape have been corrupted and cannot be decoded at time of Playback.
- The VCR Play speed is very slow.

The **'N/A'** indicator helps the operator to tell the difference between images that are not being updated during Playback and images that are being updated from tape but have no movement within the image.

The alarm indicator **'A'** will be displayed with the corresponding camera image on Monitor-A if there was an active alarm at the time that the recording was made.

Decoding of videotapes recorded on alternative multiplexers will have indicators as follows;

- SW-D7000U – "**JVC**"
- Calibur – "**CBR**"
- Calibur Lite – "**DM/Mini**"
- Dedicated Micros – "**DM/Mini**"
- Robot – "**ROBOT**"

These indicators will appear only if the programmer or operator has selected the corresponding menu option under the sub menu PLAYBACK FORMAT to decode tapes that were recorded on alternative multiplexers.

3.3.3 PLAY MODE: MONITOR-B DISPLAYS

During the Play mode, Monitor-B continues to show Live analog images in full-screen or sequencing according to the operator's selection.

CAUTION: The Monitor-B time and date, alarm, video loss, titles and all other on-screen data and indications on Monitor-B will be related to the current, Live data, and must not be confused with the Playback data which is being displayed on Monitor-A.

3.3.4 PLAY MODE: CHANGING TEXT POSITIONS AND COLORS

The positions and colors of camera titles, and the color of the date/time can be set separately for Playback. Refer to Section 3.1.5 for instructions.

NOTE: The title colors and positions in Play mode can be different to those in Live mode. The unit will keep a separate record of the selections for Live and Play.

3.3.5 PLAY MODE: SEQUENCING DURING PLAYBACK

During the Play mode, the multi-screens and full-screens are sequenced according to the sequence list and dwell times programmed in the menus. (Refer to the descriptions in the Live mode section of the manual.)

CAUTION: When sequencing the display during Playback, do not set the VCR's Play speed such that the frequency at which any one camera is Played back off the tape is slower than the frequency that the sequence list will switch through cameras in the list.

Example:
If the VCR is set to 48 hour mode while Playing back a tape with 9 cameras recorded, then a field for any one camera will generally not be sent from the VCR to the multiplexer more often that every 5 seconds. If the sequence dwell time is then set to 2 seconds, there is a very good chance that the display will not be updated with a field from VCR for the current camera in the sequence, before the sequencing switches to the next camera in the sequence list.

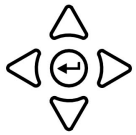
Recommendation:
Set the VCR to its 2hour speed when sequencing the displays during Playback.

NOTE: Tapes being Played back may be from different sites or different setups, and may have nothing to do with the current Live setup of the unit. Hence, the multi-screen sequencing option will sequence through only the cameras that are not already on the multi-screen. Any video loss or disabled cameras setup or detected in Live or during recording will be ignored.

3.3.6 ADJUSTING PLAYBACK BRIGHTNESS AND CONTRAST

The *SW-D7000U* provides a simple front panel adjustment to digitally adjust the contrast and brightness of the Playback signal from the VCR. (This can also be used to compensate for some VCRs that output a higher or lower video signal level than the standard.)

VCR signal contrast and brightness adjustment:
Select the Play mode and then select the camera image to be enhanced full-screen on Monitor-A. Use the arrow keys to adjust the signal.



VCR Playback Brightness:
Use the up/down arrow keys to adjust the brightness.

VCR Playback Contrast:
Use the left/right arrow keys to adjust the contrast.

3.4 ALARMS

The *SW-D7000U* are equipped with one alarm input per camera input, each of which is normally associated with its corresponding live video input. An active alarm input can result in an on-screen indication on both Monitor-A and Monitor-B, a flashing front panel LED, an internal buzzer and automatic modification of the record list to give the camera in alarm a higher update rate.

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

During alarms, the *SW-D7000U* can automatically adjust the record list so that any cameras in alarm are recorded at a higher rate. Macro functions, which can execute several pre-recorded keystrokes automatically, can be activated by any alarm input. Any alarm input can be enabled or disabled.

Alarm Handling Capability:

Alarms can be programmed to:

- Display Full-screen image of the camera in alarm on Monitor-B.
- Activate either one or both of the Alarm Output Relays.
- Latch until reset, Timed-Out (latched for a preset time), or Transparent and follow the status of the alarm input, either active or not active.

3.4.1 MANUAL ALARM ACTIVATION (PSEUDO ALARM)

Pressing the ALARM and CAMERA number (of the alarm) key simultaneously can activate a single camera recording. This will cause the alarm number corresponding to camera number selected to activate. The pre-programmed alarm responses will activate automatically through this manual activation. The programmed parameters for the alarm, such as latching mode, buzzer setting and relays will determine the alarm actions.

In addition, the camera associated with the alarm will be recorded as programmed.
To deactivate this function, simply reset the alarm as normal by pressing the ALARM key.

3.4.2 ALARM DISPLAYS IN LIVE MODE

During alarms in Live mode, Monitor-A will automatically switch to a full-screen view of the cameras in alarm. Monitor-B is simultaneously switched full-screen to the camera in alarm.

NOTE: The alarm screen on Monitor-A will be displayed only while an alarm is active. Once an alarm times out or is cleared, the display will automatically revert to the screen displayed before the alarm. It is hence very important that the installer selects the best alarm-latching mode for alarm displays.

If the operator changes the screen format while an alarm is active, then the unit will continue to display the operator's selection after the alarm clears - it will not revert to the pre-alarm screen display.

Monitors A and B Full-Screen during alarms:
During alarms in Live mode, Monitors A and B will automatically switch to a full-screen display of the camera in alarm. If multiple alarms are active, Monitors A and B will automatically sequence between the alarm cameras at a fixed 1-second dwell. This dwell is not programmable. Monitor-B cannot freeze images.

NOTE: The Monitor-B screen will not revert to its original fixed display after the alarm is cleared. It will continue to display the last alarm camera. However if sequencing

was active on Monitor-B before the alarm, then Monitor-B will continue to sequence after the alarm is cleared.

3.4.3 ALARM DISPLAYS IN PLAY MODE

Monitor-A during Play mode - Recorded Alarms:

In the Play mode the Monitor-A display will not automatically provide custom alarm displays based on recorded alarm status. Monitor-A will display the Playback images from the VCR according to operator selected formats, and will display the normal "**A**" alarm indicator only if a camera was in alarm at the time that a recording was made.

CAUTION: If a camera that had an alarm at the time of recording is not selected by the operator for display, there will be no on-screen indication at all that the alarm occurred. Thus if an operator is looking for cameras in alarm during Playback, ensure that all cameras on tape are displayed by using a 9-channel multi-screen.

Monitor-B during Play mode:

Monitor-B will continue to display Live images, according to the operator's selection. If a Live alarm occurs during Play mode, Monitor-B will automatically switch to the camera in alarm. It will sequence at a 1 second dwell time for multiple cameras in alarm. After the operator has canceled the alarm, Monitor-B will continue to display the alarm camera that was on the screen at the time that the alarm was canceled, or will continue to sequence if sequencing was enabled.

Alarm LED and Internal buzzer in PLAY Mode:

The LED and internal buzzer alarm indicators will be activated only if a Live alarm is active. Alarm status Played back from a recorded tape has no effect on these indicators. The internal buzzer can be disabled via an installer programmed menu item.

3.4.4 ALARM INDICATORS

On-screen display of text "**A**" in each corresponding cameo of multi-screen displays and **'ALM'** on any Monitor-B displays relating to cameras in alarm. The indications will be flashing. An additional indication in the form of an LED is provided on the front panel, above the ALARM key. This LED will flash if any Live alarm is active and has not been cleared. An internal will sound while any Live alarm is active. This buzzer can be disabled via a setup menu.

3.4.5 CLEARING ALARMS

To clear all displayed alarms: Press the ALARM key.

3.4.6 ALARM HISTORY

An alarm history is kept in a cyclic buffer. History data, including camera number and time and date is kept in memory for up to 100 events. The most recent 100 alarm events can be viewed on-screen in the menus, by selecting the OPERATOR menu and then selecting ALARM HISTORY. A table will appear, allowing the user to browse forward and backwards among the last 100 alarmed events. Each event relates the time of occurrence with an alarm-input number.

3.5 MOTION DETECTION

The *SW-D7000U* offers motion detection capabilities, including built-in Activity Detection. Activity detection is used to adjust the rate at which cameras are recorded and can activate an output relay to cause automatic external actions such as speed change on the VCR, or floodlights, or audio announcements and so on.

3.5.1 ACTIVITY DETECTION

Activity detection simply looks for changes in the luminance in various selected areas of the screen, and if changes are above a set threshold (sensitivity) then the activity detector interprets that to be activity. Typically, activity detection is used to detect activity in crowded areas, where activity is not the result of intruders and where human traffic is normal and expected.

If activity is detected the *SW-D7000U* will automatically change recording speed according to its programmed settings. If a relay has been programmed to be activated, then it will respond as programmed until the activity ceases.

Indicators:

If enabled in programming, the indicator '**M**' will appear in each camera scene whenever activity motion has been detected. The indicator is not present on full-screen analog displays. This motion indicator will stay on each active camera's display for at least 2 seconds after the motion has ceased.

If alarm input is activated by one of the *SW-D7000U* internal motion detector channels, the unit will react in exactly the same way as for any other external sensor activating that alarm input. The system does not differentiate between input from another alarm sensor and the input activated by the link from the internal motion detection.

3.6 SPECIAL FUNCTIONS

3.6.1 VIDEO LOSS

Indication:

LED on front panel, with on-screen display of **"V"** in each affected cameo of the multi-screen display and **'VDL'** on corresponding full-screen displays. An additional indication in the form of an LED is provided on the front panel atop the Alarm key. This LED will flash on and off on video loss detection of any camera input.

Further indication of video loss can be programmed. A relay can be closed whenever video loss is present, and the buzzer can be activated during video loss.

Video Loss action in Live mode:

Monitor-A: If the camera is being displayed at the time that video loss occurs, the camera image will be frozen. However, if sequencing is in progress, the display will be blanked when it is switched to a camera experiencing video loss.

Monitor-B: The Monitor-B display cannot freeze images, and so the display will always be blanked while 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 coded digital data recorded with each field will be updated to indicate a video loss situation on the affected camera. This video loss status is then shown during Playback. The *SW-D7000U* continues to monitor cameras that have video loss and will automatically restore the cameras when video loss ceases.

3.6.2 FREEZE OPERATION

Press the FREEZE key to freeze multi-screen or full-screen displays on Monitor-A in both the Live or Play modes. The FREEZE button is used both to freeze and to unfreeze displays.

FREEZE is not available on Monitor-B.

NOTE: Frozen images can be ZOOMed. (See Section 3.6.3)

Freezing a single cameo:
Using an 'active cameo' (see Live mode displays), the operator can freeze (or unfreeze) only one cameo in a multi-screen display. This is useful when an event must be frozen for further investigation or for review by a supervisor, but the balance of the cameras must continue to be monitored.

Indicator:
On-screen display of text **"✱"** in each affected cameo of the multi-screen display and **'FRZ'** on any corresponding full-screen displays. The indication will be flashing.

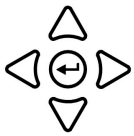
NOTE: The FREEZE key must be pressed again to unfreeze the display.

3.6.3 ZOOM

The *SW-D7000U* provides a digital 2X ZOOM on full-screen displays on Monitor-A, during Live or Play modes. ZOOM is not available on Monitor-B.

To ZOOM an image:
First select a full-screen display on Monitor-A and then press the ZOOM key. If desired, the image can be frozen before it is zoomed. Zoom operates on either a frozen or a non-frozen display. A zoomed signal can be frozen.

Electronic Pan & Tilt:
On all zoomed displays on Monitor-A use the arrow keys to pan and tilt to different sections of the zoomed image.



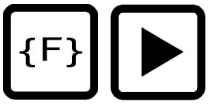
Indicator:
There is an on-screen ZOOM indication when zoom mode is in effect, and the LED in the ZOOM key is lit.

NOTE: The ZOOM key must be pressed again to unZOOM the display.

3.6.4 SELECTING VCR AS AN INPUT (VCR VIEW)

The operator may need to view the video output of the VCR. Typically this is to check VCR output or settings.

To select the VCR as an input:
Press FUNCTION and then press PLAY



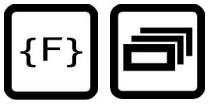
To de-select the VCR as an input:
Repeat the above procedure.

NOTE: When VCR VIEW is exited, the unit always reverts to Live mode.

3.6.5 SUMMER / WINTER TIME CHANGE

Setting the time requires the operator to know the menu password. In some installations personnel with access to the menus are not available to reset the unit's clock during time changes for summer and winter. The *SW-D7000U* provide a simple shortcut to set time forward by an hour in Spring and back by an hour in the Fall, using the following Function key sequence.

To adjust the clock by an hour for Summer/Winter time changes press FUNCTION and then press the SEQUENCE key.



In April, this will cause the time to adjust forward by one hour. In October, this will cause the time to adjust back by one hour.

This function can only be used once in each period. For example, if FUNCTION + SEQUENCE is pressed during April it will add an hour to the time, but if FUNCTION + SEQUENCE is pressed again then it will be ignored until October.

NOTE: If the Master/Slave selection is used for setting one multiplexer of several in an installation as a master clock, the Summer/Winter time change can be done on just the Master unit. The master clock will control the time and date display for the other multiplexers connected to the RS-485 network. Each multiplexer in the network needs to be separately set up via the menu for either master or slave to function properly.

3.6.6 MACRO FUNCTIONS

Macro Functions allow the operator to pre-program frequently used key sequences, and frequently used menu setups. These can then be quickly executed as a two-keystroke function.

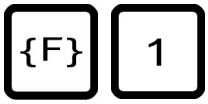
Up to nine (9) macros, each having 32 keystrokes, can be programmed, depending on the number of cameras on the model.

Macros can be programmed to start at a fixed time and day of the week in the menu. This option allows the programmer to program up to 20 events, which will automatically run one of the macro functions.

Scheduled events can be started on a preset time on a particular day of the week, or at a preset time on every day of the week. Any macro can be started by each of the 20 scheduled events, and a macro can be started by more than one event.

Keep a record of scheduled events for easy reference. A table is provided in the back of this manual to list the scheduled events.

To Play a MACRO:
A macro can be Played back simply by pressing the FUNCTION key, followed by the CAMERA key that corresponds to the macro number 1-9. A macro can be stopped during its Playback by pressing the FUNCTION key.



Indicator:
While the macro is Playing back, **'F'** and the macro number will appear.

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3.7 OPERATOR MENUS

PASSWORD

This page contains the system passwords. It is recommend that, for system security, you remove it from the manual and store it in a safe place.

The initial password, supplied with the unit for the Operator menu system, is:

Password 1,

Password

_____

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3.7.1 OPERATOR MENU ITEMS

NOTE: The ALARM key and indicator is disabled while the menu system is active.

To enter the menu system, press the MENU key and enter the 4-key password. The password is set to password 1 when the unit is shipped. You should change the password (using the menu system) and remove the password page from this manual to prevent unauthorized use of the menu system.

Once the MENU key has been pressed, the Password Box appears:

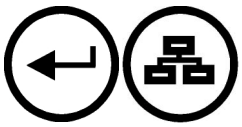
Password Box
Please enter the Password **[____]** **[CANCEL] [OK]**

The main menu bar will appear once the correct password has been entered.

Main	**QuickInstall**	**Operator**	**SystemView**

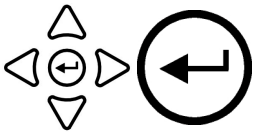
3.7.2 NAVIGATING THE OPERATOR MENU SYSTEM

You have two menu levels, designed in such a way as to make it very easy to navigate around the menu choices. The best way to understand the menu system is to use it, with this manual handy for reference.



In general, the ENTER key is used to go to the next level of menu, and the MENU key is used to 'escape' to the previous level of the menus without making any changes.

You have access to the OPERATOR AND SYSTEMVIEW menu levels only when using the Operator password.

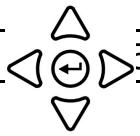


The OPERATOR menu is a list of all sub-menus, each of which you can access. The sub-menus are arranged into logical menu sections. To access a sub-menu from the OPERATOR menu, use the arrow keys to select a desired section and then press the ENTER key.

Pull-down Menus

Pull-down menus are the first sub-menu level. If additional choices are available in that sub-menu, typically these are made in Pop-up menus. Pull-down menus can be exited either by selecting Exit and then pressing the ENTER key, or by pressing the MENU key.

Pop-up Menus



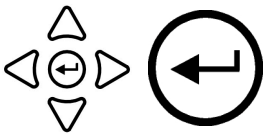
Pop-up menus are the last levels in the menu system. In general, use the left/right arrow keys to select sections in the Pop-up menu and then use the up/down arrow keys to make changes to the values. There are, however, some Pop-up menus where the arrow keys have additional functionality.

In Pop-up menus, there are no EXIT selections. To exit a Pop-up menu without making any 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 sub-menu will *not* save the changes made in that sub-menu. The MENU key is the same as CANCEL.

3.7.3 THE AVAILABLE MENUS

If you are installing or programming the unit, the Menu Bar enables you to select Main or QuickInstall using the installer's password. However the Operator password will enable you to select OPERATOR or SYSTEMVIEW only. To do this, highlight the one that you want using the left or right arrow keys and press ENTER.



Main	QuickInstall	Operator	SystemView

Field / Frame Display	**SystemView 1**
Sequencing	**SystemView 2**
Time / Date Display	**SystemView 3**
Title Display	**SystemView 4**
Playback Format	**SystemView 5**
Alarm History	**SystemView 6**
Operator Password	
Normal Record Speed	
Exit	

3.7.4 THE OPERATOR MENU

The OPERATOR Menu gives you access to all the programmable operator options, in logical sub-sections.

3.7.5 FIELD/FRAME SETTING

You can switch the resolution of digital full-screen displays from 'frame' displays to 'field' displays. The lower resolution 'field' displays can result in less 'flickering' on some high contrast camera scenes.

To switch between 'field' resolution and 'frame' resolution on a full-screen display, select the Field/Frame menu item to display the selection menu as below;

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

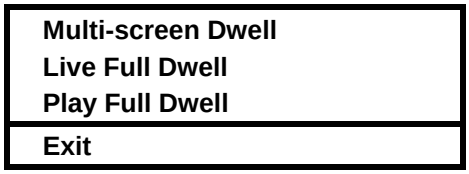
The default setting is Frame. To switch between to 'Field' use the left or right arrow keys to toggle between 'Frame' and 'Field' settings.

Note: This is a global system setting, not a camera-by-camera setting.

Field or Frame Indication (Color Models)
A "-" will be displayed next to the time / date display of camera 1 only to indicate that 'field' resolution has been selected. The indicator is removed if 'frame' resolution has been selected.

3.7.6 SEQUENCING

This option lets you specify the sequence dwell time (as displayed when SEQUENCE key is pressed). The multi-screen dwell time, (for the sequencing cameras in multi-screen mode) and the Live and Play full screen dwell times are also set here. The following pull down menu is displayed.

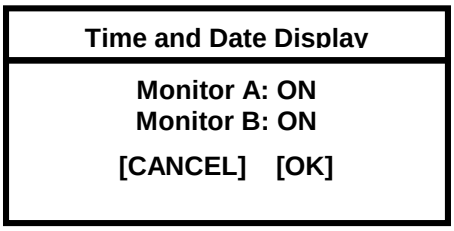


The full-screen dwell times are the same for both Monitor-A and Monitor-B in Live and Play modes. Dwell time settings determine the time between each camera sequence in the sequence list.

NOTE: The camera sequence list for Monitor-A and Monitor-B is programmed using the AutoList™ feature.

3.7.7 TIME/DATE DISPLAY

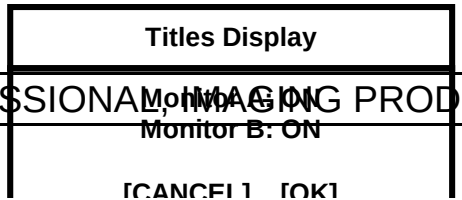
This option lets you specify whether the data and time are to be displayed on Monitor A and Monitor B. You get the following pull-down menu:



To change displays use the left or right arrow keys to turn displays ON or OFF.

3.7.8 TITLES DISPLAY

This option lets you specify whether the titles are to be displayed on Monitor A and Monitor B. You get the following pull-down menu:



To change displays use the left or right arrow keys to turn displays ON or OFF.

3.7.9 PLAYBACK FORMAT

The *SW-D7000U* can decode tapes recorded on other multiplexers. If a tape from a Dedicated Micros, Robot or Calibur compatible multiplexer is to be Played back, the proper format must first be selected from the *SW-D7000U* menus. This setting can be found in the PLAYBACK FORMAT sub-menu.

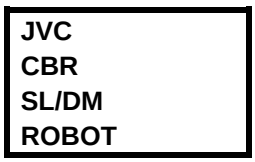
NOTE: If an alternate decoding is selected, *SW-D7000U* tapes will not be correctly decoded, and vice-versa.

DEFAULT: Format to decode *SW-D7000U Plus* recorded tapes. This is the factory default setting.

INDICATORS: Decoding of videotapes recorded on alternative multiplexers will have indicators as follows;

- SW-D7000U – "**JVC**"
- Calibur – "**CBR**"
- Calibur Lite – "**DM/Mini**"
- Dedicated Micros – "**DM/Mini**"
- Robot – "**ROBOT**"

These indicators will appear only if the programmer or operator has selected the corresponding menu option under sub menu PLAYBACK FORMAT to decode tapes that were recorded on alternative multiplexers. The menu appears as follows;



If tapes cannot be decoded: If the *SW-D7000U* cannot decode a tape that is being Played back, the system will display a blank screen. The fields will not be decoded or separated.

There are two possible reasons why a tape cannot be decoded:

- The tape was not recorded on a multiplexer,
  or
- The tape is not compatible with the decoding format selected by the programmer.

In the event that the tape was actually recorded on either a *SW-D7000U,* compatible multiplexer or an alternate multiplexer, but is not correctly decoded, first check to see that the correct PLAYBACK FORMAT has been selected in the menus.

To view tapes which were not decoded:

With the VCR Playing back a tape, press FUNCTION (**F**) then PLAY to view the undecoded input. It should be clear from the undecoded Playback video if the video is multiplexed or not, as several camera images will be overlaid on each other.

3.7.10 ALARM HISTORY

An alarm history is kept in a cyclic buffer. History data, including the camera number and time and date is kept in memory for up to 100 events. The most recent 100 alarm events can be viewed on-screen in this menu.

A table will appear, allowing you to browse forward and backwards among the last 100 alarmed events. Each event relates the time of occurrence with an alarm-input number. The RS-232 remote control capability allows an operator to upload the alarm history to a PC or a similar controlling device.

3.7.11 OPERATOR PASSWORD

The operator password may be changed in this menu item:

Password Box
Please enter the Password **[____]** **[CANCEL] [OK]**

3.7.12 NORMAL RECORD SPEED

Unless VEXT (VCR sync pulse, installer programmed) is used, it is important that the *SW-D7000U* be programmed with the same record speeds as those to which the VCR has been set for NORMAL and ALARM recording.

Time-lapse VCRs are usually capable of dual speed operation, allowing two different speeds of recording during NORMAL operation and ALARM situations. The ALARM recording speed is usually the faster speed, and normally the fastest that the recorder will go, which is the 2 HR speed setting for NTSC. Normal time-lapse recording is typically set to a slower speed, such as 12 hour to 960 hour, resulting in a tape saving while no alarm events are occurring. If the VCR switch input (VEXT) is not active, then the recording speeds in the *SW-D7000U* menus must match those set in the VCR. The factory default settings are 2 hour.

The Normal Record Speed can be programmed here in the OPERATORS menu. The factory default settings are 2 hours. The Normal Record Speed menu appears as follows;

Normal Record Speed	
Fields	**Hours**
[001]	**[002]**

The selection of either 'Fields' or 'Hours' will cause the other to change accordingly. Typically the Hour setting will be used, however it may be necessary to use the 'Field' setting dependent on the VCR used. Refer to your VCR's recommendations for field delay time to properly set this option.

Indicator:

During recording, the *SW-D7000U* indicates the speed at which it is recording on Monitor-A. It uses the same time-format for the indicator as is generally used by time lapse VCRs. For example, **R024** will be displayed to indicate that the unit is recording in 24-hour mode. (If the VCR switch input is active, then **R EXT** will be displayed.

Checking record output settings (VCR VIEW): The operator may need to view the video output of the VCR, typically this is to check VCR output or settings.

To select the VCR as input, press FUNCTION (**F**) and then press PLAY. On Monitor-A you will see the multiplexed video images as they are being output to the VCR for recording.

To de-select the input, repeat the above procedure. Notice that when VCR VIEW is exited, the unit always reverts to Live mode.

VCR Playback Speed:

The programmer must select the Playback speed on the VCR, and not on the *SW-D7000U*. There is no related setup required on the *SW-D7000U* during Playback.

The *SW-D7000U* will automatically adjust its display to match the VCR Playback speed.

Indicators:

During Play mode the on-screen text "**P**" indicates the current mode, Play mode. The speed at which the data was recorded is displayed after the "**P**". The on-screen **"P024**" indicator (for example 24 hour mode) tells the operator the speed at which the tape was recorded. It does not indicate the speed at which the tape is being played back. To find out the Playback speed, the operator must look at the VCR's Playback speed indicator.

If the recording was made using the camera switch VEXT input, then the mode and speed indicator will read **'P EXT'** in Play mode.

The time and date is displayed on-screen during Play mode. Note that this is the recorded time, not the current system time.

The indicator **'V'** will be displayed in the corresponding camera image if there was video loss at the time that the recording was made.

The *SW-D7000U* will display the text **'N/A'** if a camera is not detected on tape for 8 or more consecutive cycles during Playback. And if it is not flagged as a video loss camera the warning message **'N/A'** will display signifying that it is **N**ot **A**vailable. This is a warning message only, and can appear during Playback on full-screen or multi-screen formats on Monitor-A.

Several circumstances can cause the **'N/A'** indication:

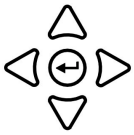
- The camera may not have been in the record list at the time of recording.
- The camera may have been disabled at the time of recording.

- The images for that camera on tape have been corrupted and cannot be decoded at time of Playback.
- The VCR Play speed is very slow.

This indicator helps the operator to tell the difference between images that are not being updated during Playback and images that are being updated from tape but have no movement within the image.

The indicator **'A'** will be displayed with the corresponding camera image on Monitor-A if there was an active alarm at the time that the recording was made.

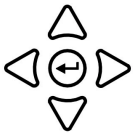
Adjusting VCR brightness and contrast:



The *SW-D7000U* provides a simple front panel adjustment to digitally adjust the contrast and brightness of the Playback signal from the VCR. (This can also be used to compensate for some VCRs, which output a higher or lower video signal level than the standard.)

Select PLAY mode and then select the Playback camera image to be enhanced full-screen on Monitor-A. Use the arrow keys to adjust the signal.

Brightness:



Use the up/down arrow keys to adjust the brightness.

Contrast:

Use the left/right arrow keys to adjust the contrast.

3.7.13 SYSTEMVIEW MENU

This menu is provides a view of all settings and parameters of your multiplexer. It is a reference list only and cannot be changed except through accessible installation menus.

4.0 MENU PROGRAMMING AND SETUP

This section describes the menu programming features and options for your multiplexer.

NOTE: The ALARM key and indicator is disabled while the menu system is active.

4.1 INITIAL POWER UP

Once your installation is complete, turn on the power. Your multiplexer will start by displaying the software version and then a multi-screen display on Monitor-A. If you have previously changed any settings in the MENU system, your settings are still stored while the power is off and are now current.

Power Up and Tests;

NOTE: Read the entire instruction manual before operating the unit.

- Power up all the cameras and the monitor, and only then power up the multiplexer by plugging in the DC 12V class 2 isolated power supply.
- With the unit in record mode, select each camera, full screen, and check the picture quality. This is live video. If the picture quality is poor, check the BNC connections and loop-through terminations, the video levels of incoming signals and potentials for power ground loops.
- Record/Play quality: Record for at least 3 minutes at normal VCR speed (2 hour mode) and then play back the recordings, selecting each camera in turn. Check the playback picture quality. Be sure to check the VCR's tracking adjustment.
- For advice on setting up cameras, consult your camera installation instructions
- Test the VCR VEXT switch pulse connection to the multiplexer by setting the unit to Record mode, starting the VCR recording and then changing the VCR record speed on the VCR. Play back the recording and observe that the unit displays **PEXT** in the top right corner of your monitor display.

4.2 USING THE MENU SYSTEM

The *SW-D7000U* video multiplexer provides programmer-friendly on-screen menus for entry of programmer data such as titles and for the selection of options. As an alternative to on-screen programming in the menus, the options can be downloaded via the RS-232 port from a central controller or PC.

To enter the on-screen program menu, press the MENU key and enter the 4-key password. The default password is set to 1, 2, 3, 4 when units are shipped from the factory.

This password can be changed by the programmer in the menus.

The MAIN MENU bar will appear once the correct password has been entered.

Main	QuickInstall	Operator	SystemView

There is a QUICKINSTALL section that gives the programmer a basic set of menu items to set up. This allows for a quick installation setup.

The MAIN MENU section gives the programmer access to all the programmable options, in logical sub-sections. This is described in more detail below.

NOTE: Each section in this manual will give a description of choices that are programmable in the MAIN MENU. It is recommended that the corresponding section in the manual be read before starting to program the options in the menus.

4.3 BATTERY BACKED-UP MEMORY FOR MENU OPTIONS

Menu option selections are automatically saved to battery backed-up memory as they are made. In general, the battery has a 5-year shelf life and can retain memory in the unit even if the unit is powered down for several months.

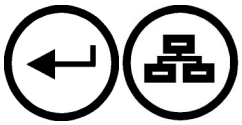
If a unit is to be powered down for any extended time (3 months or longer) then the battery should be removed during power down, and replaced when the unit is ready to be put back into service. Alternatively, install a new battery when a unit has been powered down for an extended time. Contact the factory for further details on battery replacement/removal.

CAUTION: All data will be lost if the battery is removed, and the system will revert to factory defaults.

4.4 NAVIGATING THE FOUR MENU LEVELS

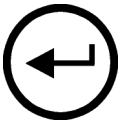
The programmer has four menu levels, designed in such a way as to make it very easy to navigate around the menu choices. The best way to understand the menu system is to use it, with the manual handy for reference.

In general, the ENTER key is used to go down to the next level of menu detail, and the MENU key is used to 'escape' up to the next higher level of the menus without making any changes.



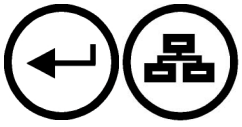
Main Menu Level:

This is a list all sub-menus, each of which can be individually accessed by the programmer. The sub-menus are arranged into logical menu sections. To access a sub-menu from the MAIN MENU, use the arrow keys to select the desired section and then press the ENTER key.



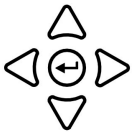
Pull-Down Menus:

Pull-Down menus are the first sub-menu levels. If additional choices are available in that section, they are typically Pop-Up menus. Pull-Down menus can be exited either by selecting EXIT and then pressing the ENTER key, or by pressing the MENU key.

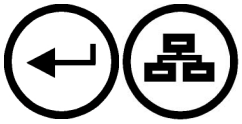


Pop-Up Menus:

Pop-Up menus are the last levels in the sub-menus. In general, use the left/right arrow keys to enter sections in the Pop-Up menu and then use the up/down arrow keys to make changes to the values. There are however some Pop-Up menus where the arrow keys have additional functionality.



In Pop-Up menus, there is no EXIT selection.

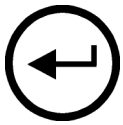


- To exit a Pop-Up menu without making any changes, press the MENU key or else select CANCEL and press the ENTER key.
- To exit and save the changes made, select OK and press the ENTER key.

CAUTION: Pressing MENU to exit from a sub-menu will *NOT* save the changes made in that sub-menu. The MENU key is the same key as CANCEL. To save the changes made in a Pop-Up menu, select OK and then press the ENTER key.

The Available Menus:

The MENU bar enables you to select MAIN, QUICKINSTALL, OPERATOR or SYSTEMVIEW. To do this, highlight the one that you want using the left or right arrow keys and press ENTER.



This manual provides instructions on programming of the MAIN menu items. The QUICKINSTALL menu items are programmed similar to the MAIN menu and are therefore explained in this manual.

The OPERATOR and SYSTEMVIEW menu's are described and explained in section 3.7.

MENUS

When selected, the menus will be listed on Monitor-A as follows:

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

4.5 TIME/DATE SET UP

This option lets you specify the time and date settings. You may chose whether to display on Monitor-A and Monitor-B, the format to be used, and if an external clock is to be used.

To edit the time and date, use the QUICKINSTALL menu or the TIME/DATE submenu from the MAIN MENU. The following pull down menu appears:

Time/Date Display
Set Time Format
Set Date Format
Set Time
Set Date
Exit

The time can be in one of two formats, and date can be in one of three formats. Time format can be either a 12-hour or 24 hour clock. Date format can be either DD/MM/YY, MM/DD/YY, or YY/MM/DD.

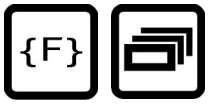
Changing Time/Date Display Colors:

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, select a full-screen view of that camera on Monitor-A , and toggle its position and color as described in Section 4.8. This time/date color setting is a *global* system setting and therefore all time/date displays will be affected.

Summer/ Winter Time Change:

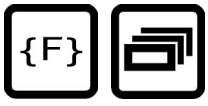
In some installations personnel with access to the menus are not available to reset the unit's clock during time changes for summer and winter. The *SW-D7000U* provides a simple shortcut to set time forward by an hour in spring and back by an hour in the fall, by using the FUNCTION key.

To adjust the clock by an hour for Summer/Winter time changes press FUNCTION and then press the SEQUENCE key.



In April, this will cause the time to be adjusted forward by one hour.
In and October, this will cause the time to be adjusted back by one hour.

This function can only be used once in each period. For example, if FUNCTION + SEQUENCE is pressed during March it will add an hour to the time, but if FUNCTION + SEQUENCE is pressed again then it will be ignored until September.



NOTE: When setting the date, select the correct day of the week, 1 to 7. For example, if today's date is set on a Wednesday and Sunday is day 1 in the week, then enter a '4' during date setup. This is used to start a SCHEDULED MACRO (Timed Macro) on the correct day.

4.6 SEQUENCE SET UP

This option lets you specify the sequence dwell time (as displayed when SEQUENCE key is pressed). The multi-screen dwell time (for the sequencing cameras in multi-screen mode) the Live and Play modes full screen dwell times are also set here. The following pull down menu is displayed.

Multi-screen Dwell
Live Full Dwell
Play Full Dwell
Exit

The full-screen dwell times are the same for both Monitor-A and Monitor-B in Live and Play modes. Dwell time settings determine the time between each camera sequence in the sequence list.

NOTE: The camera sequence list for Monitor-A and Monitor-B is programmed using the AutoList™ feature.

To start full screen sequencing on Monitor-A or B:
Select any full screen display by pressing the camera number, and then press the SEQUENCE key.

To stop full screen sequencing on Monitor-A or B:
Press SEQUENCE again, or press any camera key, or press the MULTISCREEN key.

4.7 AUTOLIST™

The operator can easily change the DEFAULT of all camera sequencing by using the AutoList™ function. AutoList™ sequence lists exist for Monitor-A, full-screen and Monitor-B. An AutoList™ also exists for the PLAY mode. DEFAULT settings for the lists are all cameras included, dwell time taken from menu. The DEFAULT dwell time is 3 seconds.

An AutoList™ recording is started in full-screen mode (LIVE or PLAY) by pressing ALARM and SEQUENCE keys simultaneously.

Then select cameras in order of the sequence desired and at time desired for individual dwell times. Press the SEQUENCE key to stop recording of the AutoList™. Dwell times of up (time between key presses) to 30 seconds are allowed. A maximum of 32 cameras may be put into an AutoList™.

Pressing any key other than a valid camera key or the SEQUENCE key during recording will void the AutoList™. To return to the DEFAULT of all cameras included in the sequence list, with a fixed menu programmed dwell time, go to the SEQUENCING menu and change the dwell time.

4.8 RECORD SET UP

This RECORD LIST option is used to specify the order in which images are to be recorded from the different camera inputs. You can have up to 30 camera numbers 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. In this menu, you can specify the normal record speed for the VCR (time lapse speed) and the alarm record speed (typically 2 hour mode).

The following pull down menu is displayed.

You may wish to review the description of “How multiplexed recording works” in Section 2.0.

RECORD LIST

A programmer programmed RECORD LIST controls the sequence in which the single fields from each camera are multiplexed to the VCR during record mode.

The list can contain any camera several times. For example, if the list is set to the equivalent of “1 2 3 3 3 4 5 6 7 8 5__”, then camera 3 will be recorded once in the record list cycle, but for three times the selected dwell time, and camera 5 will be recorded twice in the cycle. For a multiplexer, the programming for camera 5 is the preferred way to repeat a camera because it results in more evenly spaced updates for that camera. Repeat a camera only if it should normally have priority over other cameras in the list.

A blank entry ends the list. For example a list set to the equivalent of “1 2 3 _ 5 6 7 8 _” will only record cameras 1, 2 and 3. The first ‘blank’ after the ‘3’ ends the record list.

Automatic modification of the record list:

The *SW-D7000U* will automatically modify the record list in the case of alarms and/or activity detection, according to the parameters selected by the programmer in the ALARM and MOTION DETECTION menus. For example, the programmer can select ‘INTERLEAVED' recording on alarm. In this case, a camera in alarm will be recorded in virtual real time.

NOTE: If alarms and activity detection occur at the same time, the alarm’s modifications to the record list will take precedence and will cancel all modifications made to the record list via activity detection. (Refer to the Alarm and Motion Detection sections in this manual for more detail.)

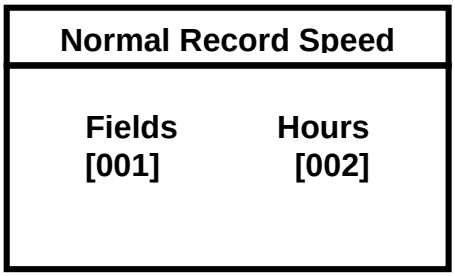
NOTE: The *SW-D7000U* does not control the setup of the VCR itself. The installer must ensure that the VCR is correctly programmed and has correct alarm inputs.

NORMAL AND ALARM RECORD SPEEDS

Unless VEXT (see 2.2) is used, it is important that the *SW-D7000U* be programmed with the same record speeds as those to which the VCR has been set for NORMAL and ALARM recording.

Time-lapse VCRs are usually capable of dual speed operation, allowing two different speeds of recording during NORMAL operation and ALARM situations. The ALARM recording speed are usually the faster speed and normally the fastest that the recorder will go, which is the 2 HR speed setting for EIA. Normal time-lapse recording is typically set to a slower speed, such as 12 hour to 960 hour, resulting in a tape saving while no alarm events are occurring. If the VCR switch input (VEXT) is not active (see VCR SETUP sub-menu), then the recording speeds in the *SW-D7000U* menus must match those set in the VCR. The factory default setting is 2 hour for NTSC/EIA.

The record speeds can be programmed in the Normal Record Speed and Alarm Record Speed sections of the Record sub-menu. The factory default settings are 2 hours for Normal and Alarm EIA. The Normal and Alarm Record Speed menu appears as follows;



The selection of either 'Fields' or 'Hours' will cause the other to change accordingly. Typically the Hour setting will be used, however it may be necessary to use the 'Field' setting dependent on the VCR used. Refer to your VCR's recommendations for field delay time to properly set this option.

Indicator:

During recording, the *SW-D7000U* indicates the speed at which it is recording on Monitor-A. It uses the same time-format for the indicator as is generally used by time lapse VCRs. For example, **R024** will be displayed to indicate that the unit is recording in 24-hour mode. (If the VCR switch input is active, then **R EXT** will be displayed.

Checking record output settings (VCR VIEW): The programmer may need to view the video output of the VCR, typically this is to check VCR output or settings.

To select the VCR as input, press FUNCTION (**F**) and then press PLAY. On Monitor-A you will see the multiplexed video images as they are being output to the VCR for recording.

To de-select the input, repeat the above procedure. Notice that when VCR VIEW is exited, the unit always reverts to Live mode.

VCR Playback Speed:

The programmer must select the Playback speed on the VCR, and not on the *SW-D7000U*. There is no related setup required on the *SW-D7000U* during Playback. The *SW-D7000U* will automatically adjust its display to match the VCR Playback speed.

Indicators:

During Play mode the on-screen text "**P**" indicates the current mode, Play mode. The speed at which the data was recorded is displayed after the "**P**". The on-screen **"P024**" indicator (for example 24 hour mode) tells the programmer the speed at which the tape was recorded. It does not indicate the speed at which the tape is being played back. To find out the Playback speed, the programmer must look at the VCR's Playback speed indicator.

If the recording was made using the camera switch VEXT input , then the mode and speed indicator will read **'P EXT'** in Play mode.

The time and date is displayed on-screen during Play mode. Note that this is the recorded time, not the current system time.

The indicator **'V'** will be displayed in the corresponding camera image if there was video loss at the time that the recording was made.

The *SW-D7000U* will display the text **'N/A'** if a camera is not detected on tape for 8 or more consecutive cycles during Playback. And if it is not flagged as a video loss camera the warning message **'N/A'** will display signifying that it is **N**ot **A**vailable. This is a warning message only, and can appear during Playback on full-screen or multi-screen formats on Monitor-A.

Several circumstances can cause the **'N/A'** indication:

- The camera may not have been in the record list at the time of recording.
- The camera may have been disabled at the time of recording.
- The images for that camera on tape have been corrupted and cannot be decoded at time of Playback.
- The VCR Play speed is very slow.

This indicator helps the operator to tell the difference between images that are not being updated during Playback and images that are being updated from tape but have no movement within the image.

The indicator **'A'** will be displayed with the corresponding camera image on Monitor-A if there was an active alarm at the time that the recording was made.

Decoding of videotapes recorded on alternative multiplexers will have indicators as follows;

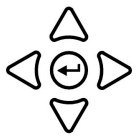
- SW-D7000U – "**JVC**"
- Calibur – "**CBR**"
- Calibur Lite – "**DM/Mini**"
- Dedicated Micros – "**DM/Mini**"
- Robot – "**ROBOT**"

These indicators will appear only if the programmer has selected the corresponding menu option under VCR SETUP sub menu PLAYBACK FORMAT to decode tapes that were recorded on alternative multiplexers.

NOTE: If the programmer attempts to Play back tapes which are not compatible with the selected format then the tapes will not be decoded correctly.

Adjusting VCR brightness and contrast:

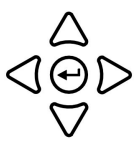
The *SW-D7000U* provides a simple front panel adjustment to digitally adjust the contrast and brightness of the Playback signal from the VCR. (This can also be used to compensate for some VCRs, which output a higher or lower video signal level than the standard.)



Select PLAY mode and then select the Playback camera image to be enhanced full-screen on Monitor-A. Use the arrow keys to adjust the signal.

Brightness:

Use the up/down arrow keys to adjust the brightness.



Contrast:

Use the left/right arrow keys to adjust the contrast.

4.9 ALARM SET UP

The standard *SW-D7000U* is equipped with one alarm input per camera input, each of which is normally associated with its corresponding Live video input. An active alarm input can result in an on-screen indication on both Monitor-A and Monitor-B, a flashing front panel LED, an internal buzzer and automatic modification of the record list to give the camera in alarm a higher update rate.

This menu item is for alarm inputs. You can specify whether the input for each camera is normally open or normally closed and if the alarms are latched on (remain active until reset), latched off (transparent – no buzzer or indicator), or timed out (active until a preset time expires). In addition, you may program output relay actions, recording parameters and actions.

Indicators:

On-screen display of text **"A"** in each corresponding cameo of multi-screen displays and **'ALM'** on any full-screen or Monitor-B displays relating to cameras in alarm. The indications will be flashing.

An additional indication in the form of an LED is provided on the front panel, under the ALARM key. This LED will flash if any Live alarm is active and has not been cleared. An internal buzzer will sound while any Live alarm is active. This buzzer can be disabled via the ALARMS sub-menu item BUZZER SETUP.

Clearing Alarms:

To clear all displayed alarms: Press the ALARM key.

MANUAL ALARM ACTIVATION (PSEUDO ALARM)

Pressing the ALARM and CAMERA number (of the alarm) key simultaneously can activate a single camera recording. This will cause the alarm number corresponding to camera number selected to activate.

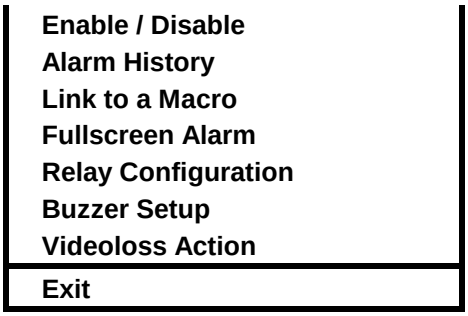
The pre-programmed alarm responses will activate automatically through this manual activation. The programmed parameters for the alarm, such as latching mode, buzzer setting and relays will determine the alarm actions. In addition, the camera associated with the alarm will be recorded as programmed.

To deactivate this function, simply reset the alarm as normal by pressing the ALARM key.

You can also specify how the images from the alarmed cameras are to be recorded (interleaved, exclusive or no change) and whether some or all of the alarms are to be enabled or disabled. You can view alarm history for the last 100 alarm and specify whether the unit's alarm output relays are normally open or normally closed.

The ALARMS menu appears as follows:

Input Configuration
Alarm Latch
External Alarm Action
Record Mode



INPUT CONFIGURATION

The alarm inputs are configured as zero potential relay contacts, individually programmable via the menu to be normally open (NO) or normally closed (N/C). The factory default is N/O for all inputs.

ALARM LATCH

There are three ways of alarm latching:

- Latched until the operator cancels it,
- Latched for a pre-set time (timed out), or
- Not latched (Transparent)

Alarm latching is controlled by a single setting (global) .

Latched alarms:
Alarms are latched as they become active. An alarm will stay active until the operator acknowledges it. There is no time out period. When the operator acknowledges the alarm, it will be cleared whether the alarm input is still active or not. Alarms that have been acknowledged by the operator will not be reactivated unless the alarm input has ceased and then restarts.

Timed out alarms:
Timed out alarms are latched for a pre-set time out period from the start of the alarm becoming active. After expiration of the time out period, the alarm is automatically cleared unless the alarm input is still active. The time out period is programmable in the menu by the programmer.

If an alarm input is still active after the time out, the alarm will stay active while the input is active, and then clear immediately that the alarm is inactive. Alarms that cease and restart before the time out is complete, will restart the time out period.

Timed out alarms can be cleared by the operator at any time. Like latched alarms, if the operator cancels the alarm, it will be cleared whether the alarm input is still active or not. Alarms that are cleared by the operator before their inputs have ceased, will not be reactivated until the alarm input ceases and restarts.

Transparent alarms (Not latched):
Alarms are active only while the alarm input is active. As soon as the alarm-input ceases, the alarm will be automatically cleared.

NOTE: The operator cannot clear A Transparent alarm. It will remain active as long as the corresponding alarm input is active.

Application Note:

If it is necessary for the operator to be able to clear active alarms, and Transparent mode is preferred, then rather select timed-out alarms instead of transparent alarms in the ALARM LATCHING menu, and set the time out period to 1 second.

ALARM ACTION

The *SW-D7000U* provides extensive alarm handling capability:

On alarm activation:

- A full-screen image of the camera in alarm will automatically appear on Monitor-B.
- Monitor-A will automatically switch to pre-programmed quad display for a single alarm. In addition, a different pre-programmed multi-screen display for multiple, simultaneous alarm occurrences may be displayed.
- The programmer can program the unit to automatically freeze the camera-in-alarm at the instant of alarm.
- Each alarm input can be programmed by the programmer to activate either one or both of the Alarm Output Relays.

Simple menu tables make it quick and easy for the programmer to select the desired alarm action for each camera.

Alarm Action Set-Up:

The programmer can program the 'camera in alarm' and three 'associated cameras' which will be most useful to view with the alarm camera, using the ALARM ACTION section of the ALARMS sub-menu. This allows the programmer to program any 4 camera numbers. The first camera number will define the camera in alarm on Monitor-A and Monitor-B.

The factory default for the camera in alarm is the camera having the same number as the alarm input. (For example, the camera in alarm factory default for alarm input #6 will be camera #6.)

The factory defaults for associated cameras will be the camera before the camera in alarm, plus the two cameras *after* the camera in alarm.

Example:

The default for associated cameras for camera #6 will be 5, 7 and 8, while the default for associated cameras for camera #1 will be 16, 2, 3. The three automatic custom alarm screens are as follows, depending on the number of active alarms:

Displays for more than 3 simultaneous alarms:

If more than 3 alarms are active at the same time, the *SW-D7000U* will automatically select a display format which is able to show all the cameras in alarm. Associated cameras will not be selected for display, and alarms will not be frozen. This will be a 9-way display. As each new alarm is received, the unit will automatically adjust the display.

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. Use the YES/NO selection under FRZ in the ALARM ACTION section of the ALARMS sub-menu to select this option. The factory default for all alarm inputs is that the camera-in-alarm will be frozen when an alarm input is received.

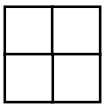
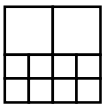
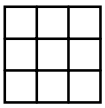
NOTE: If additional alarms are received while some cameras are already frozen, then all frozen cameras will be unfrozen and re-frozen at the instant that the new alarm input was received.

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

Application Note:

If the programmer programs one of the associated cameras to the same camera number as the camera in alarm, then this feature can be used to have a frozen image of the camera in alarm as well as a Live image of that alarm camera on Monitor-A at the same time. This is not needed if Monitor-B is installed.

A customized alarm display will be selected automatically by the multiplexer, depending on the number of simultaneous alarm inputs, to show all cameras in alarm, plus associated cameras. The custom screens are automatic for up to 3 simultaneous alarms.

		
Top left quadrant is the camera in alarm and the remaining 3 quadrants are associated cameras	Top 2 quadrants are cameras in alarm and 3 of the remaining cameos below each quadrant are associated cameras	Top 3 cameos are cameras in alarm and the 2 cameos below each top cameo are associated cameras

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

MON-B Full-Screen during alarms:

During alarms, Monitor-B will automatically switch to a full-screen display of the camera in alarm. If multiple alarms are active, Monitor-B will automatically sequence between the alarm cameras at a fixed 1 second dwell. This dwell is not programmable. Monitor-B cannot freeze images.

NOTE: The Monitor-B screen will not revert to its original fixed display after the alarm is cleared. It will continue to display the last alarm camera. However if sequencing was active on Monitor-B before the alarm, then Monitor-B will continue to sequence after the alarm is cleared.

If the operator changes the screen format while an alarm is active, then the unit will continue to display the operator's selection after the alarm clears - it will not revert to the pre-alarm screen display.

Fullscreen Alarm:

In the event that the programmer does not install Monitor-B, and relies solely on Monitor-A for all system information, a full-screen alarm display on Monitor-A may be preferred to the custom multi-screen displays.

In this case, the programmer can select a menu option in the ALARMS sub-menu that will cause Monitor-A to switch to a full-screen display of the camera in alarm, and sequence full-screen between multiple alarms, exactly as Monitor-B normally does. The custom alarm screens will not appear. (This is a global setting for all cameras).

A single full-screen alarm will be frozen, if the option was selected in the ALARM ACTION menus. However this option will be ignored for multiple full-screen alarms on Monitor-A.

EXTERNAL ALARM ACTIONS (RELAY OUTPUTS)

Two alarm relay outputs are provided to enable the programmer to program automatic external actions such as a speed change on the VCR, or alarm floodlights or sirens. The alarm relay outputs are rated at 500 mA. They are provided in either the normally open (N/O) and normally closed (N/C) configuration on the rear panel of the unit (programmable), and are isolated.

The alarm relays can be activated by motion detection, by active alarms, by video loss, or by MACRO functions. The choice of which relay is activated by which event is selectable via the menus.

Selecting the Relay Outputs linked to Alarm Inputs:
Once EXTERNAL ALARM ACTION is selected, a menu will appear, allowing the programmer to select one of the following four choices for each alarm input:

- None
- Relay 1
- Relay 2
- Relay 1&2.

NOTE: When making this selection, remember that video loss and motion detection can also be programmed to activate one of these output relays.

Factory default settings for Alarm Output Relays are:

All Alarm Inputs	will activate	Relay 1
All Activity Detection	will activate	Relay 2

Additional alarm output data:
The *SW-D7000U* also allows the programmer to read the status of alarm inputs for each camera via the RS-232 remote control port.

RECORD MODE

The programmer can select NORMAL recording, EXCLUSIVE recording or INTERLEAVED recording to take place whenever an alarm occurs. The latter two modes will always result in a faster update to tape of a camera in alarm. This is a system wide (*global*) setting, and is not set up individually for each alarm input.

Normal:
NORMAL recording during alarms means that there is no priority recording for the cameras in alarm, and the record list will be unchanged while alarms are active. However, the programmer can still program the VCR and the unit to switch from a time lapse speed to a faster recording speed during alarms, which by itself can ensure that alarm events have a faster update speed.

Exclusive:
EXCLUSIVE recording will cause the system to record only alarmed cameras. All non-alarmed cameras are omitted from the record list while an alarm is active. EXCLUSIVE recording mode is typically chosen only when several simultaneous alarms can be expected to occur very often, and where a near real-time record of those alarm events are needed. The disadvantage of choosing this mode is that other cameras will not be recorded at all while any alarm is active.

If EXCLUSIVE alarm recording is selected, then the alarm-input sensors used need to be:

- very comprehensive, so that alarm events are not missed, and
- reliable, so that the system does not start exclusive alarm mode recordings for false alarms.

NOTE: If only one camera is in alarm and the alarm speed is set to the 2 hour mode, then the unit will automatically select INTERLEAVED recording even though EXCLUSIVE mode is selected.

Interleaved:

During INTERLEAVED recording both the alarmed cameras and non-alarmed cameras are recorded, but alarmed cameras, having a higher priority, are interleaved between non-alarmed cameras. 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 Cameras in alarm: 4,6	INTERLEAVED recording sequence: 1,4,6,2,4,6,3,4,6,5,4,6,7,4,6,1, ...etc.

NOTE: Because of the fast update rate of the SW-D7000U, if one camera is in alarm then INTERLEAVED mode will result in real-time Playback of the camera in alarm. In general, on the SW-D7000U, INTERLEAVED recording will give very fast update speeds of cameras in alarm even for multiple alarms. **INTERLEAVED mode is the recommended setting.**

ENABLE / DISABLE

Any alarm input can be set up as being active (enabled) or inactive (disabled). In this option you may select:

INDVIDUAL ENABLE ENABLE ALL DISABLE ALL

ALARM HISTORY

An alarm history is kept in a cyclic buffer. History data, including camera number and time and date is kept in memory for up to 100 events. The most recent 100 alarm events can be viewed on-screen in the menus, by selecting the ALARMS menu and then selecting ALARM HISTORY. A table will appear, allowing the programmer to browse forward and backwards among the last 100 alarmed events. Each event relates is recorded with the Alarm #, Date, Time and Relay #. The RS-232 remote control capability also allows an operator to upload the alarm history to a PC or a similar controlling device.

LINK TO A MACRO

Any alarm input can be linked to any macro function. This can be used to start a pre-programmed sequence of keystrokes each time an alarm occurs. Several alarm inputs can be linked to the same macro function. To link alarm inputs to macro functions, use the LINK TO MACRO menu in the ALARMS sub-menu.

NOTE: The system will always complete normal alarm action before executing the macro function.

FULLSCREEN ALARM

This option allows setting the system to display only a FULLSCREEN image on Monitor-A instead of the default multiscreen (or associated alarm camera displays) for any alarm input. See section 4.9.

NOTE: This is a *global* setting and will apply to ALL alarms.

RELAY CONFIGURATION

Each relay (1 & 2) can be configured for N/OPEN (normally open NO) or N/CLOSED (normally closed NC). This menu item allows selection of either NC or NO configuration.

BUZZER SETUP

The internal buzzer is programmable to respond under various conditions. The sub-menu item under ALARMS is as follows:

Buzzer Setup	
Global Buzzer	**:ON**
Live Alarm Buzzer	**:ON**
Videoloss Buzzer	**:ON**
Playback Buzzer	**:ON**
[CANCEL] [OK]	

- Global Buzzer – Set to OFF if some Buzzer responses are not to be active.
- Live Alarm Buzzer – Set to OFF if no Buzzer is desired on incoming Live Alarms.
- Video loss Buzzer – Set to OFF if no Buzzer is desired on video loss detection
- Playback Buzzer – Set to OFF if no Buzzer is desired on during the playback of Videotapes where alarms are present.

VIDEO LOSS ACTION

This option is used to specify what is to happen in the event of loss of a video input. Video loss can occur due to a failed camera or disconnection of the video signal to the multiplexer.

Video Loss action in LIVE Mode:

Monitor-A: If the camera is being displayed at the time that video loss occurs, the camera image will be frozen. However, if sequencing is in progress, the display will be blanked when it is switched to a camera experiencing video loss.

Monitor-B: Monitor-B cannot freeze images, and so the display will always be blanked while a camera with video loss is selected.

Video Loss action in RECORD Mode:

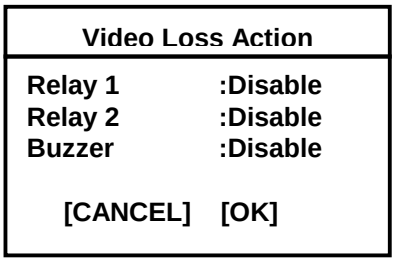
When video loss is detected, the affected camera is temporarily removed from the record list, and the coded digital data recorded with each field will be updated to indicate a video loss situation on the affected camera. This video loss status is then shown during Playback. The *SW-D7000U* continues

to monitor cameras that have video loss and will automatically restore the cameras when video loss ceases.

Indications:
On-screen display of text **"V"** in each affected cameo of the multi-screen display and **'VDL'** on any corresponding full-screen displays. An additional indication in the form of an LED is provided on the front panel atop the Alarm key. This LED will flash on and off on video loss detection of any camera input.

Further indications of video loss can be programmed. A relay can be closed whenever video loss is present, and the buzzer can be activated during video loss.

Select the camera for setup, then select either ENABLES or DISABLE for each relay (Relay-1 and Relay-2) and ENABLE or DISABLE for the Buzzer.



NOTE: The *SW-D7000U* allows the programmer to disable cameras which are not connected, or will be out of service for an extended time, so that unnecessary video loss messages can be avoided. (Refer to Camera Disable below)

4.10 MACROS

Macro Functions allow the programmer to pre-program frequently used key sequences, and frequently used menu setups. These can then be quickly executed as a two-keystroke function. The FUNCTION button plus the macro number (1-9) will start the macro. Pressing the FUNCTION button again can stop a macro.

Up to nine (9) macros, each having 32 keystrokes, can be programmed into the *SW-D7000U,* depending on the number of cameras on the model.

The macro functions can be started automatically at up to 20 preset times during the week by using the built-in macro scheduler. (See MACRO TIMED START)

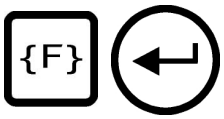
To program MACROS select the MACROS menu item and the following pull-down sub-menu appears:

MACRO RECORD

To initiate recording, select MACRO RECORD in the MACRO sub-menu, and select one of the macros (1-32) on which to start recording. Upon selection, the system will automatically exit the menus and go to a default screen. Subsequent keystrokes will be recorded into that macro.

NOTE: An on-screen indicator, **'F'** plus the macro number', will appear and will stay on the screen until recording of that macro is complete.

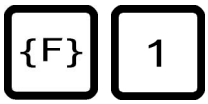
Each keystroke will be recorded, until either the FUNCTION key and ENTER is pressed to terminate the macro recording, or until 32 keystrokes have been recorded.



Special keys functions during MACRO RECORD:

The following two-key combinations provide the programmer with special actions within macros.

FUNCTION then **1**	Activate output relay 1
FUNCTION then **2**	Reset output relay 1
FUNCTION then **3**	PAUSE macro, 1 second
FUNCTION then **4**	PAUSE macro, 5 seconds
FUNCTION then **5**	Activate output relay 2
FUNCTION then **6**	Reset output relay 2
FUNCTION then **ENTER**	end Macro recording



Recording new Menu Setups during MACRO RECORD:

If the programmer presses the MENU key during macro recording, recording of keystrokes is stopped. Instead of recording keystrokes while in the menus, the programmer only records the final setting of each setup parameter for those sub-menus, which are accessed by the programmer. Each time the MENU key is pressed it is counted as one keystroke in the MACRO.

Upon Playback of the macro, the unit will retrieve only those recorded menu setup parameters, and will set the unit up accordingly. Parameters in sub-menus, which were not accessed during recording of the macros, will not be recorded or retrieved during Playback of the macro.

These new menu setups can be activated manually or automatically by time and day (see MACRO TIMED START) or on Alarm (see ALARM SETUP). Typical uses of this unique MACRO feature are;

- Different Alarm Associated Alarm Display screens or Alarm Actions
- Different sequence tables
- Different recording modes or playback format
- Disable or Enable Cameras, Alarms and Motion Detection

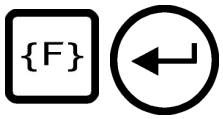
Exceptions to Menu Setup MACRO RECORD:

- In the Motion Detection sub-menu, motion detection can only be *enabled* and *disabled* via macros. Other motion detection parameters cannot be set via macros
- The following parameters cannot be set up via a macro, and should be set up during installation:
  - Output Relay selection, 1 or 2 or both, per input.
  - Output Relay NO or NC selection.
  - 'M' indicator ON/OFF selection
  - Video loss relays and buzzer selections, per input
  - VCR switch pulse edge selection

NOTE: Parameters such as Motion Detection Grids, which cannot be changed via a macro function, usually because of the extensive memory requirements, can be set up via RS-232.

Ending MACRO RECORD:

Press FUNCTION key and ENTER to end the recording of a Macro.



Recommendation:

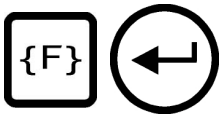
Make a list of the function of each macro with its macro number, for later use in playing the macros. A section is provided in the back of this manual to conveniently keep a list of the macros and their intended functions.

Editing a MACRO RECORD:

There is no macro editing capability. To check a macro function, play back the Macro by pressing the FUNCTION key and the macro number, and check for correct operation. If the macro does not appear to function correctly, delete the macro as described below and re-enter it.

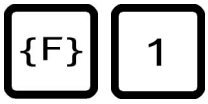
Deleting a MACRO RECORD:

Delete a macro by recording an empty macro over the macro that is to be deleted. To record an empty macro, start macro recording from the MACRO RECORD sub-menu and immediately press FUNCTION key and ENTER to end the recording.



Playing a MACRO RECORD:

A macro can be Played back simply by pressing the FUNCTION key followed by the macro number (1-9).



Indicator:

While the macro is Playing back, '**F'** and the macro number will appear on Monitor-A.

Stopping a Macro:

A macro can be stopped during its Playback by pressing the FUNCTION key.

MACRO TIMED START

Macros can be started at a fixed time and day of the week by using the MACRO TIMED START. This option allows the programmer to program up to 20 events, which will automatically run one of the macro functions.

Scheduled events can be started on a preset time on a particular day of the week, or at a preset time on every day of the week. Any macro can be started by each of the 20 scheduled events, and a macro can be started by more than one event.

MACRO TIMED START setup includes:

- EVENT – Numbered 1-20 for scheduled events.
- DAY - Select the day of the week (1-7) on which the event must start a macro. (The DAY of the week corresponding to today's date can be found in the DATE setup menu from the TIME/DATE submenu.) If the macro is to be run every day at the same time, select '**' for the DAY field. If a '0' is entered for the day, the scheduled event entry is canceled and will not start the macro.

- TIME - Select the time to run the macro function.
- MACRO - Enter the number of the macro to run.

Keep a record of scheduled events for easy reference. A table is provided in the back of this manual to list the scheduled events.

4.11 MOTION DETECTION

The *SW-D7000U* offers motion detection capabilities, including built-in Activity Detection. Activity detection is used to adjust the rate at which cameras are recorded and can activate an output relay to cause automatic external actions such as speed change on the VCR, or floodlights, or audio announcements and so on.

The difference between Intrusion detection and Activity detection:
When digital video motion detection is used, it is important to know the difference between simple activity detection and intrusion detection.

Activity detection:

Activity detection simply looks for changes in the luminance in various selected areas of the screen, and if changes are above a set threshold (sensitivity) then the activity detector interprets that to be activity. Typically, activity detection is used to detect activity in crowded areas, where activity is not the result of intruders and where human traffic is normal and expected.

Intrusion detection:
Intrusion detection looks for real movement in the scene, and raises an alarm if it is found. It is used to monitor areas where no human traffic is allowed or expected, and so when movement is found it will be likely that it was caused by an intruder, and so an alarm should result. It is hence important that intrusion detectors do not cause false alarms, resulting from light changes, camera vibration or random reflections of light in the scene. An ability to reduce false motion alarms, in areas where no motion is expected, is the key difference between intrusion detection and activity detection.

Upon selection of the MOTION DETECTION menu item, the following pull-down sub-menu appears:

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

ENABLE / DISABLE DETECTION

Each camera has the MOTION DETECTION function disabled when the unit is first powered up (Factory default). The first setup item, which should be done by a programmer, is to enable the cameras.

Select the ENABLE/DISABLE DETECTION section of the MOTION DETECTION sub-menu and the following menu appears:

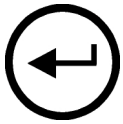
Individual Enable

Enable All
Disable All

You may now select the cameras to be enabled (1-9) or you many enable or disable all.

SETUP ACTIVE ZONES

Select the SETUP ACTIVE ZONES sub-menu and select the camera to setup. Once you select the camera and press ENTER you will move to the screen showing 256 zones arranged in a 16 x 16 grid to be enabled or disabled. The factory default is that all zones are enabled.



NOTE: All cameras have motion completely disabled as detailed under ENABLE/DISABLE above. This must not be confused with enabling or disabling individual zones within the camera scene.

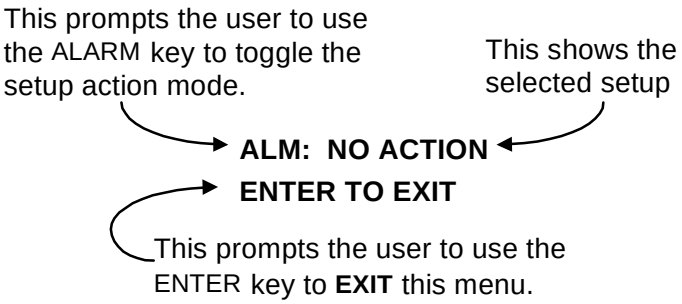
Recommendation:
Disable zones which may contain movement that is incidental or not important. Incidental motion can include the possible movement of trees in the wind, vehicles in an adjacent street, allowable pedestrian areas, or areas with glass and other highly reflective surfaces which can be sources of apparent motion via reflections.

Cursor: The top left zone will have a flashing square indicator, known as the cursor. The zone, which has the flashing cursor, can be enabled or disabled. When the cursor reaches the end of a line in the zone grid, it will automatically wrap around to the beginning of the next line.

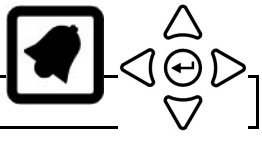
Use the ALARM key to select either the ENABLE or DISABLE or NO ACTION mode. The ALARM key toggles between the three possible zone setup modes, and the flashing cursor will change color as follows:

- No Action = Cursor color gray/white (flashing)
- Enable Zones = Cursor color black/white (flashing)
- Disable Zones = Cursor color clear/white (flashing)

In addition to the flashing cursor indicator, you will see on-screen text prompts indicating the cursor mode selected. The on-screen prompts shown during the zone setup are as follows:

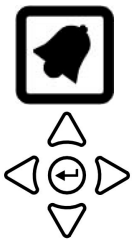


- **NO ACTION** - used to move the cursor around the grid to zones that must be changed to enabled or disabled. After selecting NO ACTION

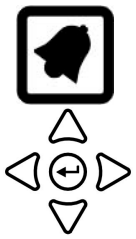


mode by using the ALARM key, use the ARROW keys, to go to the first zone to be changed.

- **ENABLE ZONES** - is used to change disabled zones to enabled zones. Enabled zones will sense motion, according to SETUP PARAMETERS. After selecting ENABLE ZONES mode by using the ALARM key, the flashing cursor will be changed to the enabled mode (black/white flashing). Once ENABLE ZONES is selected, the ARROW keys move the cursor and enable adjacent zones. Change the mode to NO ACTION or DISABLE ZONES when no more adjacent zones need to be enabled.



- **DISABLE ZONES** - is used to change enabled zones to disabled zones. Zones which are disabled will ignore all motion. After selecting DISABLE ZONES mode by using the ALARM key the flashing cursor will be changed to the disabled mode (clear/white flashing). Once DISABLE ZONES is selected, use the ARROW to move the cursor and disable adjacent zones as necessary. Change the mode to NO ACTION or ENABLE ZONES when no more adjacent zones need to be changed.

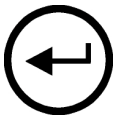


Indications:
To indicate whether each zone is enabled or disabled, enabled zones have a Grey **“”** indication and disabled zones have a clear indication inside the corresponding grid position.

SENSITIVITY SCOPE

Your multiplexer includes a helpful graphic representation of motion and the sensitivity settings to simplify motion detection set-up. You will a “Sensitivity Scope” on the left side lower portion of the image. This scope represents the sensitivity setting you have selected in RED. A BLACK line that will move from bottom to top of the scope when movement occurs represents the actual motion/activity in the scene. When the BLACK line intersects with the RED line, a motion alarm is activated. In this mode, the sensitivity can be changed by selecting the number keys 1-10. In this way, the actual motion in the scene can be used to set the most appropriate sensitivity setting.

Exit SETUP ACTIVE ZONES:
When all zones have been set up, the programmer can exit back to the MOTION DETECTION sub-menu. Press ENTER and all changes will be saved as they were made.



INDICATE DETECTION

This option in the MOTION DETECTION sub-menu is used to activate the indicator **‘M’** for motion detection on Monitor-A. The factory default setting is set to activate the indicator. If you desire the on-screen indicator not to display when motion is detected then select NO in the sub-menu. This is a *“global”* setting and will affect all cameras with enabled motion detection.

If motion has been turned on, but there is no **‘M’** indication in the corresponding cameras display when motion is present, check the SETUP ACTIVE ZONES and the sensitivity settings as detailed below.

ACTIVITY / INTRUSION

The SETUP PARAMETERS for motion detection (sensitivity, target size, false alarm rejection, record rate, output relays and links to alarm inputs), are chosen on a camera-by-camera basis. The parameters available for each camera in this menu item will depend on whether INTRUSION DETECTION or ACTIVITY DETECTION is the intended use of that camera.

In the ACTIVITY/INTRUSION sub-menu you may select by camera number the intended use of motion detection. (The factory default for each camera is ACTIVITY DETECTION.) This selection will result in different SETUP PARAMETERS for either INTRUSION DETECTION or ACTIVITY DETECTION.

SETUP PARAMETERS

Activity Parameters Setup

The menu for ACTIVITY PARAMETERS SETUP appears as:

Activity Parameters Setup		
Camera	**:**	**01**
Sensitivity	**:**	**05**
Record Rate	**:**	**4X**
Relay Output	**:**	**02**
[CANCEL]		**[OK]**

Sensitivity:

The motion detection sensitivity on each camera can be set to levels of 1-10. This setting is set on a camera-by-camera basis, and applies to all the ENABLED zones in any particular camera scene.

Each of the 256 zones (16 x 16 grid) stores 256 grey levels of discrimination, averaged over the zone's area. Changes in the 256 grey levels in a zone can be set as follows:

- 1 = least sensitive setting = detect change of 100 of 256 grey levels in a zone, averaged over a zone.
- 10 = most sensitive setting = detect change of 5 of 256 grey levels in a zone, averaged over a zone.

NOTE: The highest sensitivity of 10 is only reasonable if the video signal has extremely low noise. (The factory default sensitivity setting is 5, for all cameras.)

Recommendations:

When setting sensitivity, choose the highest setting that does not result in very frequent 'false' motion detections. The higher the sensitivity, the more likely it is that incidental movement will be detected as motion, so if motion is indicated without apparent cause, reduce the sensitivity.

When setting high sensitivity, such as 8, 9 or 10, it is important to ensure that sources of false motion, such as trees and bushes which may move in the wind, or windows which can reflect flashes of light, are eliminated from detection if possible. To do this, DISABLE the corresponding zones as described above in SETUP ACTIVE ZONES.

Sensitivity Scope:

Refer to the description under SETUP ACTIVE ZONES sub-menu for further information on setting sensitivity.

Record Rate: (This setting is only used in ACTIVITY DETECTION).

Your multiplexer shares one VCR between many cameras. As a result, the video from a camera which normally provides 60 fields a second must be time sliced and reduced to a rate of far fewer fields every second to allow the other cameras to insert fields into the same video stream going to the VCR. (Refer to the explanatory figure in the RECORDING section of this manual.)

The lowered update rate for each camera is not a problem if there is little movement in the scene, but if there is activity in the camera view it is always preferable to get as many updated fields of the activity as possible so that important activity events are recorded.

The *SW-D7000U* solves this dilemma in two ways:

1. It has a very fast, optimized update rate to tape, which at 2-hour alarm speeds is about 3 times faster than most other multiplexers.

2. It allows the rate of update of each camera to tape to be automatically adjusted by the system if there is ongoing motion within a camera's field of view. In this way, cameras without activity are recorded less often and cameras with frequent and continuous activity are recorded more often and so can capture more of the activity.

A unique feature of the *SW-D7000U* is that the increase in update rate can be set by the programmer in this RECORD RATE sub-menu. Cameras with activity can be recorded twice (2X) as often they would normally be recorded, or four times (4X) as often, or they can be INTERLEAVED. This allows programmers the flexibility to set up the system according to the requirements of their particular installation.

NOTE: The record list and record rate can also be modified by an active alarm. A record list update resulting from an active alarm input will always override any record list modifications which resulted from sensing activity. (See ALARMS sub-menu RECORD MODE)

There are four choices of RECORD RATE for activity:

- NONE - If most cameras are expected to have motion at the same time, or if the particular camera scene is not important yet has a lot of motion.
- 2X - If not all cameras are connected.
- 4X - The factory default setting.
- INTERLEAVED - If very few cameras will have motion at any one time.

Relay Output:

Two relay outputs are provided to enable the programmer to program automatic external actions such as a speed change on the VCR, or floodlights, or audio announcements and so on. The relay outputs are rated at 500 mA. They are provided in both the normally open (N/O) and normally closed (N/C) configuration on the rear panel of the unit, and are isolated.

The two relays can be activated by activity detection, by active alarms, video loss or by Macro functions. There are four choices on relay output for ACTIVITY on each camera:

- None – no relay is activated
- Relay 1
- Relay 2
- Relay 1&2.

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

- All Alarm Inputs will activate Relay 1
- All Activity Detection will activate Relay 2
- All Video Loss will activate None

SETUP PARAMETERS

Activity Parameters Setup

The menu for ACTIVITY PARAMETERS SETUP appears as:

Activity Parameters Setup	
Camera	**: 01**
Sensitivity	**: 05**
Record Rate	**: 4X**
Relay Output	**: 02**
[CANCEL]	**[OK]**

Sensitivity:

The motion detection sensitivity on each camera can be set to levels of 1-10. This setting is set on a camera-by-camera basis, and applies to all the ENABLED zones in any particular camera scene.

Each of the 256 zones (16 x 16 grid) stores 256 Grey levels of discrimination, averaged over the zone's area. Changes in the 256 Grey levels in a zone can be set as follows:

- 1 = least sensitive setting = detect change of 100 of 256 Grey levels in a zone, averaged over a zone.
- 10 = most sensitive setting = detect change of 5 of 256 Grey levels in a zone, averaged over a zone.

NOTE: The highest sensitivity of 10 is only reasonable if the video signal has extremely low noise. (The factory default sensitivity setting is 5, for all cameras.)

Recommendations:

When setting sensitivity, choose the highest setting that does not result in very frequent 'false' motion detection. The higher the sensitivity, the more likely it is that incidental movement will be detected as motion, so if motion is indicated without apparent cause, reduce the sensitivity.

When setting high sensitivity, such as 8, 9 or 10, it is important to ensure that sources of false motion, such as trees and bushes which may move in the wind, or windows which can reflect flashes of light, are eliminated from detection if possible. To do this, DISABLE the corresponding zones as described above in SETUP ACTIVE ZONES.

Sensitivity Scope:

Refer to the description under SETUP ACTIVE ZONES sub-menu for further information on setting sensitivity.

Record Rate: (This setting is only used in ACTIVITY DETECTION).

Your multiplexer shares one VCR between many cameras. As a result, the video from a camera which normally provides 60 fields a second must be time sliced and reduced to a rate of far fewer

fields every second to allow the other cameras to insert fields into the same video stream going to the VCR. (Refer to the explanatory figure in the RECORDING section of this manual.)

The lowered update rate for each camera is not a problem if there is little movement in the scene, but if there is activity in the camera view it is always preferable to get as many updated fields of the activity as possible so that important activity events are recorded.

The *SW-D7000U* solves this dilemma in two ways:

1. It has a very fast, optimized update rate to tape, which at 2-hour alarm speeds is about 3 times faster than most other multiplexers.

2. It allows the rate of update of each camera to tape to be automatically adjusted by the system if there is ongoing motion within a camera's field of view. In this way, cameras without activity are recorded less often and cameras with frequent and continuous activity are recorded more often and so can capture more of the activity.

A unique feature of the *SW-D7000U* is that the increase in update rate can be set by the programmer in this RECORD RATE sub-menu. Cameras with activity can be recorded twice (2X) as often they would normally be recorded, or four times (4X) as often, or they can be INTERLEAVED. This allows programmers the flexibility to set up the system according to the requirements of their particular installation.

NOTE: The record list and record rate can also be modified by an active alarm. A record list update resulting from an active alarm input will always override any record list modifications which resulted from sensing activity. (See ALARMS sub-menu RECORD MODE)

There are four choices of RECORD RATE for activity:

- NONE - If most cameras are expected to have motion at the same time, or if the particular camera scene is not important yet has a lot of motion.
- 2X - If not all cameras are connected.
- 4X - The factory default setting.
- INTERLEAVED - If very few cameras will have motion at any one time.

Relay Output:

Two relay outputs are provided to enable the programmer to program automatic external actions such as a speed change on the VCR, or floodlights, or audio announcements and so on. The relay outputs are rated at 500 mA. They are provided in both the normally open (N/O) and normally closed (N/C) configuration on the rear panel of the unit, and are isolated. The two relays can be activated by activity detection, by active alarms, video loss or by Macro functions.

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

- None – no relay is activated
- Relay 1
- Relay 2
- Relay 1&2.

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

- All Alarm Inputs will activate Relay 1
- All Activity Detection will activate Relay 2
- All Video Loss will activate None

INTRUSION PARAMETERS SETUP

NOTE: Settings of INTRUSION parameters are very important for correct detection by the system. Read the following section carefully.

The menu for INTRUSION PARAMETERS SETUP appears as:

Intrusion Parameters Setup		
Camera	**:**	**01**
Sensitivity	**:**	**05**
Rejection	**:**	**LOW**
Target Size	**:**	**001**
Link to Alarm	**:**	**01**
[CANCEL]		**[OK]**

Sensitivity:

Refer to instructions above for ACTIVITY.

Recommendations:

When choosing sensitivity, choose the highest setting that does not result in very frequent 'false' motion detections, while the FALSE ALARM REJECTION setting is on 'LOW', and the TARGET SIZE is set correctly. (See below). The higher the sensitivity, the more likely it is that incidental movement will be detected as motion, so if motion is indicated without apparent cause, reduce the sensitivity. Do no use sensitivity level 10 with INTRUSION, and use level 9 carefully.

When setting high sensitivity, such as 8, 9 or 10, it is very important to ensure that sources of false motion, such as trees and bushes which may move in the wind, or windows which can reflect flashes of light, are eliminated from detection if possible. To do this, DISABLE the corresponding zones as described above in SETUP ACTIVE ZONES. Only after the sensitivity is set to its reasonable maximum should the programmer adjust the False Alarm Rejection as needed.

Rejection (False Alarm):

(This setup is only used for INTRUSION detection.) Motion detection and false alarms will vary from scene to scene, but processing to reduce false alarms can often result in reduced motion detection sensitivity. To optimize performance, the *SW-D7000U* allows the programmer to choose one of three levels of false alarm rejection separately for each camera as follows:

LOW If the sensitivity of the motion detection is adequate to detect the intended targets, and there are few false alarms.

MEDIUM If there are frequent false alarms resulting from changes in light or similar apparent movement over the whole camera scene. This can be caused by lights being turned on and off, objects passing very close to the camera lens, camera vibration, or the sun going behind clouds.

HIGH If there are frequent false alarms resulting from flashes of light on reflective surfaces, or infrequent fast moving objects such as birds. Also changes in light as above should be considered. If using the HIGH setting, check the recommendation for Lens Selection below.

The factory default setting is LOW, for all cameras.

NOTE: It is important that the sensitivity and target size be set up *before* the false alarm rejection is changed. It is also important that zones are not enabled for areas which have frequent

incidental movement, such as trees which may move in the wind, highly reflective surfaces like windows or stretches of water, and traffic or pedestrians in the background.

Selecting the false alarm rejection level: It is recommended that the false alarm rejection setting is left on LOW. Before changing the setting to MEDIUM or HIGH to reduce false alarms, first check that the sensitivity, target size and zones are set up correctly. Do not select a higher false alarm rejection level unless it is necessary.

Target Size:

(This setup is only used for intrusion detection.) The size of a target for motion detection (normally a human being) will vary depending on the camera lens and the distance from the camera. In general, if size discrimination is used during the detection of motion, motion detection will result in fewer false alarms from small animals, movement of plants in the wind or reflections. 'TARGET SIZE' defines the minimum size.

The *SW-D7000U* target size setting is related to the number of zones that a single target will fill. The programmer can set the TARGET SIZE separately for each camera, between 1 and 256. The factory default target size setting is 1. This means that all sizes of targets will result in motion detection if the sensitivity is set up correctly.

Setting TARGET SIZE:

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

Example:

If a human normally fills a 5 x 2 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, unless false alarms from smaller targets are common. For more reliable intrusion detection, the target size should preferably be set to *at least 2*.

Recommended LENS SELECTION for Intrusion Detection:

- Select a lens so that a human will always fill 2 or more zones in the camera scene.
- Select the lens and field of view so that the Target will normally remain in the field of view for at least two seconds, at expected target speeds.

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

Link to Alarm:

(This setup is only used for INTRUSION detection.) The *SW-D7000U's* motion detection for each camera can be used as a sensor to activate any of the alarm inputs. The *SW-D7000U* allows the programmer to link the internal motion detection directly to the unit's rear panel alarm to create a motion based alarm sensor input. No physical wiring is needed to link to an alarm input, just the menu entry.

If an *SW-D7000U* alarm input is activated by one of the *SW-D7000U's* internal motion detector channels, the unit will react in exactly the same way as for any other external sensor activating that alarm input. The system does not differentiate between an input from another alarm sensor and the input activated by the link from the internal motion detection.

Because the *SW-D7000U's* internal motion detection can be set up to be more effective than simple activity detection, it can be used to replace a separate external motion detector and hence will save the user that cost in most installations. Detection of intruders is normally only set up in areas where there is little or no expected movement. In high traffic areas, intrusion detection is not a feasible application of motion detection.

NOTE: Some outdoor environments can have very complex intrusion detection requirements. In those cases, it is preferable to use a motion detector intended specifically for complex outdoor situations.

Linking INTRUSION to Alarms:

Select the Alarm number which is to be activated (1-9) in the sub-menu.

Remember that if motion is linked to alarms then, because the alarm input record list always takes priority over the activity record list, the alarm record list will be used. The activity record list will be ignored while an alarm is active, even if that alarm results from motion linked to an alarm input.

Linking INTRUSION to Macro functions:

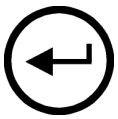
Intrusion detection can be linked indirectly to a macro, by linking an alarm input which has been set to start macros. (See LINK TO MACROS sub-menu in ALARMS section)

4.12 CAMERA TITLES SET UP

This option is used to specify the titles to be displayed on Monitor-A and Monitor-B for each camera input. The following pull down menu is displayed.

Title Display
Edit Titles
Exit

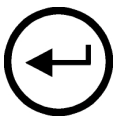
To Edit Camera Titles: (Factory defaults: Camera 1 - Camera 9.)



Select the EDIT TITLES sub-menu ant then press ENTER. Select the camera number by pressing numbers 1 –9 on the keypad then presses ENTER. Use the arrow keys to select characters and the arrow keys to insert the character. The SEQUENCE key selects the character bank (upper/lower case, numbers, punctuation etc.)

Titles can be displayed either at the top or at the bottom of the camera view, or titles can be switched off. Titles can also be displayed as black, grey, or white characters. This feature is selectable for each camera during either Live or Play modes.

To change the position and color of the title for any camera:



Select a full-screen view of that camera on Monitor-A, and then press ENTER to toggle the title position and color. The programmer can select one of seven options for each camera. The following cycle will be followed as the ENTER key is pressed:

- Top, black
- Top, gray
- Top, white
- Bottom, black
- Bottom, gray
- Bottom, white

- Do not display this camera title

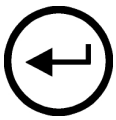
NOTE: This setting affects only the Monitor-A display. Text on the Monitor-B display is not moved.

In any Monitor-A full-screen display, all text except the time and date will move from the top to the bottom of the screen, and vice versa.

The title display can be turned on or off for each camera via the CAMERA TITLES sub-menu. This is in effect for both Live and Play modes.

To Change the Color of the Time/Date Display:

The Time/Date display cannot be moved from its position in the top right corner of the Monitor-A display. However the color may be changed by cycling through the colors as done for camera titles. You may only change Time/Date display colors by selecting Camera 01, then press ENTER several times until the camera title display changes color and position, then the last toggle is the Time/Date color change.



This time/date color setting is a global system setting and therefore all time/date displays will be affected.

4.13 CAMERA SET UP

The camera set-up and adjustment options provide several important settings for efficient use of the camera images available. The menu item CAMERA SET-UP provides for;

Camera AGC
Camera Disable
Covert Camera
Camera Scope

CAMERA AGC

The unit has a versatile camera-by-camera AGC Range adjustment. This allows the programmer to set the unit up via simple menus to compensate for camera inputs that have excessive video levels outside of the normal AGC range. This is a setup function, which would normally be used only by the installer.

Example:

Cameras with auto-iris lenses may be adjusted during installation so that the video is consistently at a much higher level (brighter) than the standard video signals. This is often done to compensate for cable losses, or simply to improve the general video appearance. This may take the video levels beyond the range of the unit's AGC. The AGC range adjustment will compensate for this. The *SW-D7000U* allows the programmer to easily adjust the input AGC separately for each camera from the front panel controls.

Adjusting the input AGC for any camera:

Select the CAMERA AGC sub-menu from the CAMERA SETUP MENU. You may now select the camera to be adjusted (1-9) and the selected camera view will appear in the background of the menu screen. The default AGC range setting is 5 for all inputs. You may adjust the range from 1-10 and view the actual image changes to your preference.

Signal Gain Set-up	
Camera	:01
Gain	:05
[CANCEL]	[OK]

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

CAMERA DISABLE

If a camera is not installed then the continual display of the on-screen VIDEO LOSS indicator **"V"**, for a cameo or **VDL** for a full-screen, can distract an operator.
In addition, unnecessary time must be spent to remove the camera from the sequence lists and the record lists. The *SW-D7000U* takes care of this situation with one setting.

The *SW-D7000U* allows the programmer to set inactive cameras as "DISABLED" via a menu setting, so that video loss indications are not shown. In addition, disabled cameras are automatically removed from all programmable sequence lists and the Record List. Besides being used for cameras, which are not installed, this feature is also very useful when a camera is undergoing maintenance, or has a temporary fault.

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

Individual Disable
Power Up Disable
Auto Disable Now
Exit

- Individual Disable - provides a listing of each camera that can be disabled or enabled individually.
- Power Up Disable - if activated, causes the multiplexer to automatically disable cameras whose sync or video level are not present on the video inputs.
- Auto Disable Now - will automatically disable cameras whose sync or video levels are not present on the video inputs.

COVERT CAMERA

This menu item allows for cameras to be removed from the LIVE display view without affecting the recording of the camera for review at a later time. In this way, operators or subjects will not be aware of cameras being recorded.
Camera Scope

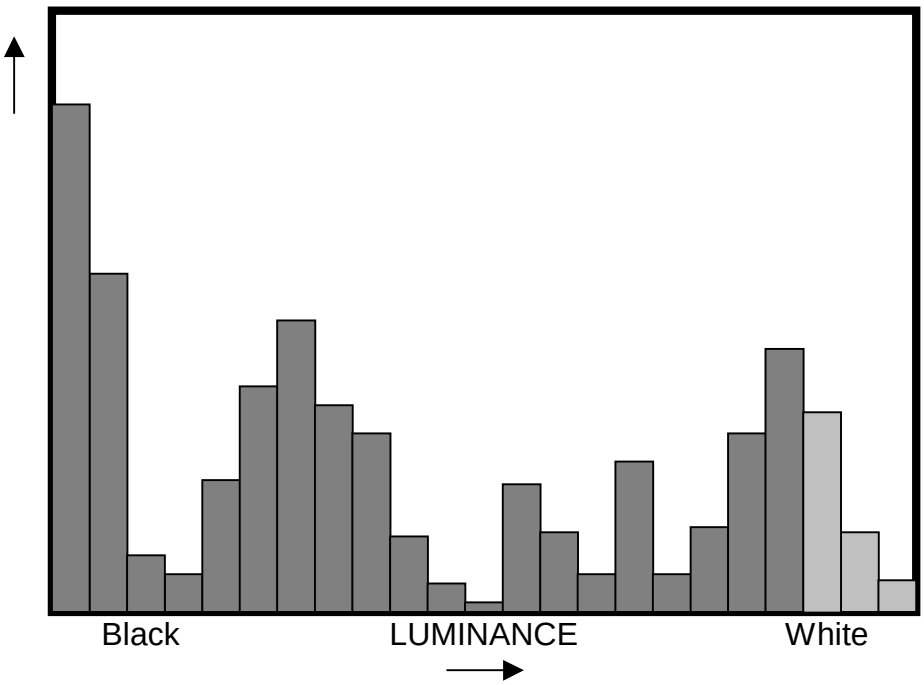
This menu item provides a camera scope representing the incoming analog camera video signal. To

Covert Camera	
Camera 01	:NO
Camera 02	:NO
Camera 03	:NO
Camera 04	:NO
Camera 05	:NO
Etc.	
[CANCEL]	[OK]

optimize the motion detection abilities and the associated signal the system installer should take more care in system camera set-up.

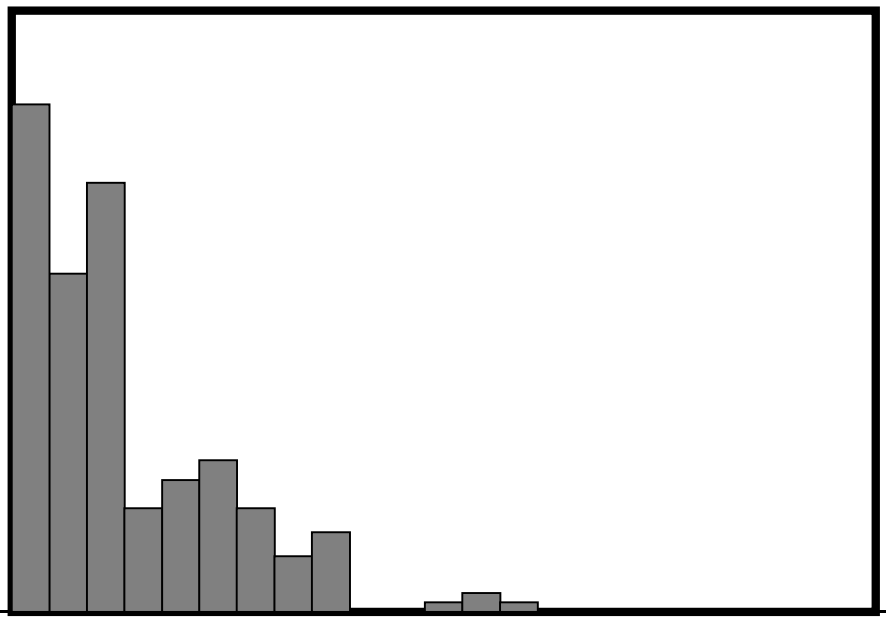
The camera scope displays the characteristics of the incoming camera video signal useful to a system installer in determining if certain aspects of the system installation have been done correctly. The installer can quickly and easily determine firstly if cameras or their lenses have been set up incorrectly or secondly if a camera input level and dynamic range is suitable for the motion detection circuits in a multiplexer.

RELATIVE AMPLITUDE **FIGURE 1**



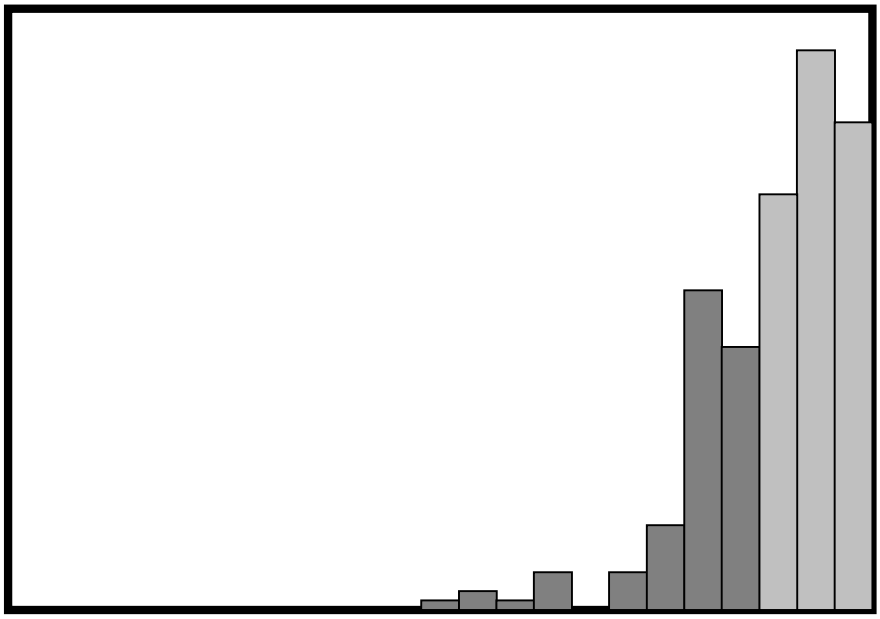
In Figure 1, the camera has a wide range of luminance, or Grey scales and shows a signal with a high level of detail. This signal will be suitable for video motion detection applications because high detail is present.

FIGURE 2



In Figure 2, the camera's luminance levels are low and have a smaller range, so that it will be more difficult for the user to see detail both when viewing live displays of the camera as well as when reviewing multiplexed recordings of the camera. This camera will also not be suitable for video motion detection, because relatively few Grey levels will be digitized and changes with time are less likely to be detected by the VMD circuits.

FIGURE 3



In Figure 3, the camera's lens or its AGC is out of adjustment, resulting in high luminance levels. As a result, detail in the scene is likely to be lost during multiplexed recording, and video motion detection will be ineffective.

Benefits of the camera scope:

- An inexperienced installer can use it to check the 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 a technical support person who is remote from the site can easily get an untrained person on the site to describe the camera scopes. This will then enable a diagnosis to be made without incurring the time and expense of a visit to the site.

4.14 VCR SETUP

This option is used to specify the type of VCR that is connected to the multiplexer. You can also define the VCR as to whether it has a switch input (VEXT) and negative or positive leading edge. The choices are;

S-VHS/Composite
Switch Input ON/OFF
Switch Edge
Signal Level

Playback Format

S-VHS OR COMPOSITE VCR

S-VHS and Composite video output's are available. Select type your VCR type here.

SWITCH INPUT ON/OFF

Most time lapse VCRs provide a hard-wired pulse output to devices such as the multiplexer, indicating that the VCR has just completed recording of one field of the current camera. This lets the multiplexer know that it can switch to a new camera input. This feature simplifies the programmer's installation since it automatically takes care of synchronizing the normal and alarm record speeds of the *SW-D7000U* with those of the time lapse VCR. No VCR speeds then need to be set up in the *SW-D7000U* menus, only on the VCR itself.

This feature can be disabled or enabled in the program menus via the SWITCH INPUT ON/OFF selection in the VCR SETUP sub-menu. The factory default setting is ON, which allows the auto-detection circuit to operate. This is the recommended setting.

NOTE: On power up, the auto-detection circuit will wait about 15 seconds to check if the VCR starts to output a switch pulse. The period of 15 seconds is approximately the period between switch pulses when the VCR is running in 960-hour mode. During this brief time the multiplexer will not switch cameras at all unless a switch pulse is detected. If the switch pulse ceases, the multiplexer will also take about 15 seconds to determine that it has in fact stopped and not just changed to 960-hour mode.

Indicator:
An on-screen '**R EXT**' indicator replaces the record speed indicator while this switch input is active and detected by the *SW-D7000U*.

SWITCH EDGE

You can select a Negative Edge or Positive Edge for the pulse edge used for the Switch/VEXT input.

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

SIGNAL LEVEL

There are different signal levels from different types of time lapse VCRs. The multiplexer is designed to operate with all commonly available time lapse VCRs (type B). There are some less common VCRs (type A, type C) which have different signal levels. The multiplexer has a menu switch to change between VCR types in the VCR Set-up sub-menu.

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

PLAYBACK FORMAT

The *SW-D7000U* can decode tapes recorded on other multiplexers. If a tape from a Dedicated Micros, Robot or Calibur compatible multiplexer is to be Played back, the proper format must first be selected from the *SW-D7000U* menus. This setting is in the PLAYBACK FORMAT sub-menu.

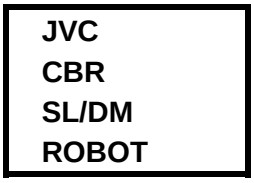
NOTE: If an alternate decoding is selected, *SW-D7000U* tapes will not be correctly decoded, and vice-versa.

DEFAULT:
Format to decode *SW-D7000U Plus* recorded tapes. This is the factory default setting.

INDICATORS:
Decoding of videotapes recorded on alternative multiplexers will have indicators as follows:

- SW-D7000U – "**JVC**"
- Calibur – "**CBR**"
- Calibur Lite – "**DM/Mini**"
- Dedicated Micros – "**DM/Mini**"
- Robot – "**ROBOT**"

These indicators will appear only if the programmer has selected the corresponding menu option under VCR SETUP sub menu PLAYBACK FORMAT to decode tapes that were recorded on alternative multiplexers. The menu appears as follows:



If tapes cannot be decoded:
If the *SW-D7000U* cannot decode a tape that is being Played back, the system will display a blank screen. The fields will not be decoded or separated.

There are two possible reasons why a tape cannot be decoded:

- The tape was not recorded on a multiplexer, -- *or* --
- The tape is not compatible with the decoding format selected by the programmer.

In the event that the tape was actually recorded on either a *SW-D7000U* compatible multiplexer or an alternate multiplexer, but is not correctly decoded, first check to see that the correct PLAYBACK FORMAT has been selected in the menus.

To view tapes which were not decoded:
With the VCR Playing back a tape, press FUNCTION (**F**) then PLAY to view the undecoded input. It should be clear from the undecoded Playback video if the video is multiplexed or not, as several camera images will be overlaid on each other.

4.15 COMMUNICATIONS

This option is used to specify the baud rate to be used for the RS-232 serial port and the unit's network address for RS485 communications.

RS232

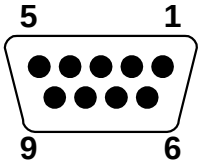
RS-232 remote control is through a D-sub 9pin connector on the rear panel. This is used to provide programmable remote control from a PC or similar controller. The programmer is able to set up all menu functions and also control front panel controls via the RS-232 port.
Functions included are:

- All menu programming
- All front panel keys
- Alarm history read
- Alarm Input Status read

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

To set the baud rate, select the RS-232 section of the COMMUNICATIONS sub-menu.

Refer to the *SW-D7000U's* **RS-232 Remote Control Protocol** data sheets in the rear of this manual for more details.



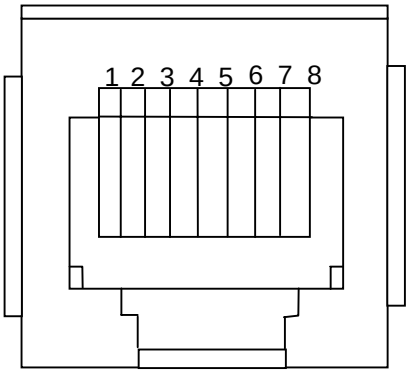
The figure shows the socket on the multiplexer as seen from the back of the unit. The numbers are marked on the connector itself, although they may difficult to read.

PIN NUMBERS	FUNCTION
Pin 2	Receive Data (RX)
Pin 3	Transmit Data (TX)
Pin 5	Ground (GRD)

RS485

The *SW-D7000U* can have up to 15 optional remote keyboards controlling it through the RS-485 network. In addition, a single remote keyboard can control up to 15 different *SW-D7000U* units, (or a mixture of keyboards and multiplexers totaling 9 devices), installed in a multi-drop configuration. The *SW-D7000U* unit address on the RS-485 network is programmable in the RS-485 section of the COMMUNICATIONS submenu. Here you will set the address of the multiplexer on the network 1-15.

Using RS-485 correctly wired, the total length of all connections on one configuration of multiple units and multiple keyboards can be up to 3,200 feet (1,000 meters) from end to end. A remote keyboard can thus be up to 1,000 meters from the actual unit without the need for additional transmission equipment.



RJ45 Socket Looking from the rear of the multiplexer

The connection details are the following:

Pin	Use
1	GND
2	DC +12V
3	Network +ve
4 (NC)	-
5 (NC)	-
6	Network -ve
7	GND
8	DC +12V

For networks longer than 30 feet, you must terminate the network at each end for it to work reliably. The network is polarity dependent, so you must connect pin 3 to pin 3 and pin 4 to pin 4. Do not reverse the polarity of the network.

Do NOT use the DC 12V power leads in the RS-485 cable UNLESS it is to be used on a one-to-one connection between a unit with DC 12V power and a unit with no DC 12V power. For example, from a multiplexer directly to a keyboard that does not have its own power source. In all other circumstances, such as multi-dropped multiplexers, do NOT use the DC 12V power leads in the RS-485 cable.

If you choose to power another unit (e.g. a single keyboard), you can do this up to 30 feet from the multiplexer. Use a 4-core shielded cable, equivalent to Belden 8723.

For more detail on the remote keyboard, refer to the **JVC-KB Remote Keyboard** instruction sheet.

4.16 FRONT PANEL LOCK

This option is used to lock and unlock the front panel keyboard of the multiplexer. You get the following menu:

Unlock Keyboard
Lock Keyboard

Once LOCK KEYBOARD is selected, the multiplexer can only be operated again through the input of the proper password. The only key which will operate is the MENU key.

4.17 FACTORY SETTINGS

This option is used to reset the multiplexer to factory settings. The password for this setting is only available for factory authorized service personnel. Contact Customer Support for further information.

4.18 PASSWORDS

This option is used to change the passwords for the menu system. You get the following menu:

Installer Password
Operator Password

When you have entered a new password, a confirmation box is displayed where you must specify the same password again. You should note the new password on the Password page of this document, which should be removed and stored in a safe place.

If the password is lost, contact the factory Customer Support for assistance.

5.0 WARRANTY

JVC LIMITED WARRANTY

JVC PROFESSIONAL PRODUCTS COMPANY
DIVISION OF JVC AMERICAS CORP.
1700 Valley Road, Wayne, NJ 07470

JVC PROFESSIONAL PRODUCTS COMPANY warrants this product and all parts thereof, except as set forth below ONLY TO THE ORIGINAL PURCHASER AT RETAIL to be FREE FROM DEFECTIVE MATERIALS AND WORKMANSHIP from the date of original retail purchase for the period as shown below:

PARTS: TWO YEARS **LABOR: TWO YEARS**

PRODUCTS: SW-D8000U --- 16 Channel Color Video Multiplexer
SW-D7000U --- 9 Channel Color Video Multiplexer

THIS LIMITED WARRANTY IS VALID ONLY IN THE FIFTY (50) UNITED STATES, THE DISTRICT OF COLUMBIA AND IN THE COMMONWEALTH OF PUERTO RICO.

WHAT WE WILL DO:
If this product is found to be defective, JVC will repair or replace defective parts at no charge to the original owner. Such repair and replacement services shall be rendered by JVC during normal business hours at JVC Factory Service Centers. Parts used for replacement are warranted only for the remainder of the Warranty Period. All products and parts thereof may be brought to a JVC Factory Service Center on a carry-in basis.

WHAT YOU MUST DO FOR WARRANTY SERVICE:
Return your products to a JVC Factory Service Center with a copy of your bill of sale. For your nearest JVC Factory Service Center, please call toll free: **(800) 537-5722.**

If service is not available locally, box the product carefully, preferably in the original carton, and ship, insured, with a copy of your bill of sale plus a letter of explanation of the problem to the nearest JVC Factory Service Center, the name and location will be given to you by the toll-free number.

If you have any questions concerning your JVC Professional Product, please contact our TECHNICAL SUPPORT ENGINEER, PROFESSIONAL SERVICE DIVISION at **(800) 526-5308.**

WHAT IS NOT COVERED:
This limited warranty provided by JVC does not cover:

1. Products which have been subject to abuse, accident, alteration modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, or if repaired by anyone other than a service facility authorized by JVC to render such service, or if affixed to any attachment not provided with the products, or if the model or serial number has been altered, tampered with, defaced or removed;
2. Initial installation and installation and removal for repair;
3. Operational adjustments covered in the Owner's Manual, normal maintenance, video and audio head cleaning;
4. Damage that occurs in shipment, due to acts of God, and cosmetic damage;
5. Signal reception problems and failures due to line power surge;
6. Except that Video Heads, Rotary Head, Video Pick-up Tubes, Cartridge are covered for 90 days from the date of purchase;

7. Accessories;
8. Batteries (except that Rechargeable Batteries are covered for 90 days from the date of purchase).

There are no express warranties except as listed above.

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Some states do not allow the exclusion of incidental or consequential damages or limitations on how long an implied warranty lasts, so these limitation or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

6.0 RS-232 REMOTE PROTOCOL

COMMUNICATION TYPES:

a. Remote Front Panel Simulation
b. Remote Data and Commands

a. Remote Front Panel Simulation

i) Data structure

Byte 1: 0xFF
Byte 2: 0x55
Byte 3: Front Panel Key Code

ii) Description

Byte 1 & 2 are communication type ID bytes.

Byte 3 contains the code for a specific front panel key.

The different keys and their corresponding codes are as follows.

NO_KEY	0	
RECORD_KEY	1	
PLAY_KEY	2	
LIVE_KEY	3	
ALARM_KEY	4	
FREEZE_KEY	5	
ZOOM_KEY	6	
SEQ_KEY	7	
MON-A_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	
RESERVED	18 - 24	
MENU_SETUP_KEY	41	
SELECT_KEY	42	
RESERVED	43	
MACRO_KEY	44	
RESERVED	45 - 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	Pseudo Key
DOWN_LEFT_KEY	69	Pseudo Key
UP_RIGHT_KEY	70	Pseudo Key
DOWN_RIGHT_KEY	71	Pseudo Key
RESERVED	72	
RESERVED	73	

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 - SPARE
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 - 45 RESERVED
46 - TITLE9
47 - 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 - 78 RESERVED
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, it will respond by sending a **0xff** start byte, followed by the requested information, 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 alarm history list

buffer[0] = 0xff;
buffer[1] = 0xBB;
buffer[2] = 0;
buffer[3] = HISTORY;

d) RESERVED

e) SPARE

f) Changing the record list

buffer[0] = 0xff;
buffer[1] = 0xAA;
buffer[2] = 30;
buffer[3] = RECLIST;
buffer[4] -- buffer[33] = BINARY 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] = BINARY list of 16 numbers - digits (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] = BINARY list of 16 numbers - digits (0 - Disable,1 -Enable)

i) Changing the Multi-screen Dwell time

buffer[0] = 0xff;
buffer[1] = 0xAA;
buffer[2] = 1;
buffer[3] = DWELLQUAD;
buffer[4] = BINARY 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] = BINARY 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] = BINARY 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] = BINARY list of 16 numbers (0-Normally Closed, 1-Normally Open)

m) Changing the macro link values

buffer[0] = 0xff;
buffer[1] = 0xAA;
buffer[2] = 16;
buffer[3] = MACROLINK;
buffer[4] -- buffer[19] = BINARY 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] = BINARY number (1-1200, 1-2400, 2-4800, 3-9600)

o) Enable or disable the display of the time and the date

buffer[0] = 0xff;
buffer[1] = 0xAA;
buffer[2] = 1;
buffer[3] = DISPLAYTD;
buffer[4] = BINARY 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] = BINARY number (0-disable,1-enable)

q) Changing the Playback format

buffer[0] = 0xff;
buffer[1] = 0xAA;
buffer[2] = 1;
buffer[3] = PBFORMAT;
buffer[4] = BINARY number (0-JVC+/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] = BINARY 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] = BINARY number - Time format (0 - 12 hour, 1 - 24hour)
buffer[5] = BINARY number - 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] = BINARY number - Language
(0 - Eng, 1 - 4 = per Eproms supplied);

u) Enabling/disabling external VCR switch

buffer[0] = 0xff;
buffer[1] = 0xAA;
buffer[2] = 1;
buffer[3] = EXTSWITCH;
buffer[4] = BINARY 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] = BINARY number - (1 - 13)

w) Setting the alarm record speed

buffer[0] = 0xff;
buffer[1] = 0xAA;
buffer[2] = 1;
buffer[3] = ALMRECSPEED;
buffer[4] = BINARY 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
Multi-screen	= 8
'1'	= 9
'2'	= 10
'3'	= 11
'4'	= 12
'5'	= 13
'6'	= 14
'7'	= 15
'8'	= 16
'9'	= 17
RESERVED	= 18 - 24
Setup	= 25
Select	= 26
RESERVED	= 27
RESERVED	= 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 the macros may not exceed 32.

y) Enable activity detection

buffer[0] = 0xff;
buffer[1] = 0xAA;
buffer[2] = 16;
buffer[3] = ENACTIVITY;
buffer[4] - buffer[19] = BINARY list of 16 numbers - digits (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] = BINARY digits
corresponding to zones
Two bytes per row, 16 rows. (1 - active, 0 - off)

NOTE: This message must be used with caution. Delays of 100ms 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) 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] = 0 - OFF, 1 - ON

af) Setting the VCR Type

buffer[0] = 0xff;
buffer[1] = 0xAA;
buffer[2] = 1;
buffer[3] = VCR_TYPE;
buffer[4] = 0 - Type A,1 - Type B

ag) Setting the Vext Pulse active edge

buffer[0] = 0xff;
buffer[1] = 0xAA;
buffer[2] = 1;
buffer[3] = SWITCH_EDGE;
buffer[4] = 1 - Negative Edge,0 - Positive Edge

ah) Setting the Network Address

buffer[0] = 0xff;
buffer[1] = 0xAA;
buffer[2] = 1;
buffer[3] = NETWORK_ADDRESS;
buffer[4] = Binary number (0-255)

UPLOADING DATA

a) Alarm history list

When the "Request Alarm History List" message is received by the system, it will respond by sending 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 /line-feed pair

b) Activity settings

Six bytes are uploaded:
i) Sensitivity, (1-10)
ii) Relay, (0 - none, 1-relay 1, 2-relay 2, 3-both)
iii) Link to Alarm, (1-16)
iv) False Alarm Reject. (0-low, 1-med., 2 - high)
v) Size Discrimination, (1-255)
vi) Record Rate, (0-none, 1-2x, 2-4x, 3-interleaved)

c) Activity grids

16 x 32 bytes are uploaded. 1st 32 bytes are zones from camera 1, 2nd 32 bytes from camera 2, etc. (Two bytes per row, 16 rows)

d) Alarm and video loss

4 bytes are uploaded. The 1st 2 represent the alarms in the system (MSB,LSB). The next 2 bytes represent the video loss status (MSB, LSB).

7.0 TECHNICAL SPECIFICATIONS:

Video

Outputs:
Three (3) BNC connectors, EIA/CCIR compatible video outputs.
- One MON-A multi-screen output. (Composite/S-video)
- One MON-B analog switching output. (Composite)
- One VCR output. (Composite/S-video)

Inputs:
Cameras: Nine (9) looping BNC connectors, EIA/CCIR compatible, auto terminating.
Color camera inputs accepted
VCR Inputs: One (1), EIA/CCIR compatible.
- One BNC
- Signal Conditioning: Input AGC, 0.7 to 2.0V p-p composite video inputs accepted

Termination: Automatic, 75Ω, or Hi-Z if looped
Display memory: 1024 X 1024 memory array, 8 Mb total display memory
Resolution: 720 pixels, Horizontal, 484 active lines Vertical (576 CCIR)
Grey Scale: 256 levels

Alarm Handling:
Alarm inputs: 9. Programmable NO or NC in menus.
Alarm outputs: Two (2), form C relays, each NO and NC. Rated 0.5A continuous, 1.0 A momentary.
Alarm latching: Three (3) settings: Latched; Transparent; Timed-out, programmable 1 - 100 seconds
Alarm recording: Automatic priority control, interleaved or exclusive, or none, programmable.
Alarm Displays: Automatic full-screen

Controls and Indicators:
- RECORD: Selects record mode. On duplex model, always in record mode. This key inactive. Indicator: RECORD mode, LED.
- PLAY: Selects playback mode for decoding tapes.
- LIVE: Selects LIVE mode
- SEQUENCE: Starts or stops sequencing. Operates on multi-screen displays and full-screen displays. Selectable dwell and Autolists, on-screen indicator
- MACRO FUNCTION: {F} Starts execution of a pre-recorded key sequence. Nine macros can be recorded by the user.
- ALARM: Used to accept active alarms
- ALARM INDICATORS: LED flashes on any active alarm; plus buzzer
- FREEZE: Freezes any display in LIVE or PLAY mode.
- ZOOM: Zooms 2x, fully interlaced, on full-screen displays
- PAN & TILT: Arrow keys provide digital pan & tilt on zoomed images.
- MULTISCREEN: Selects multi-screen displays in LIVE or PLAY mode. Toggles through list of multi-screens.
- 1 - 9 Selects corresponding camera, full-screen
- ARROWS: Used in menus, and Pan & Tilt.
- MENU SETUP: Enters and exits menu screens for programming of unit. Password protected.
- ENTER: Selects menu items when programming. Starts active cameo mode, LED lit in active cameo mode
- TIME and DATE: Displays time and date in selectable formats plus Summer/Winter time change function.

Video Indicators:
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, using {F} key.

Motion Detection:
Zones per camera: 256, 16 x 16 grid
Sensitivity settings: 10 levels
Grey 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: D-sub9, female. 3-wire, N-8-1. 9600baud. Allows remote programming of menus, upload of status data, remote control of front panel buttons
RS-485: RJ-45 remote keyboard input, looping, up to 1000m (3,200') without conditioning.

Physical:
Dimensions: 14.2W X 13.9D X 2.6H in. (360W x 355D x 65H mm)
Weight: 9.3 lbs. (4.2 kg) nominal
Finish Paint: Light gray powdercoat, light texture

Environmental:
Temperature: 0 to 40 °C, operating.
Relative Humidity: 90%, non-condensing

Electrical:
Input Voltage: DC 12V, 240 or 110Vac to DC 12V adapter included.
Power: 40 W nominal

MODEL NUMBERS / OPTIONS:
SW-D7000U 9 channel color Duplex
Remote Keyboard: JVC-KB Includes motorized PTZ control capabilities.

Note: All specifications are subject to change without notice.

8.0 LIST OF MACRO FUNCTIONS

MACRO #	DESCRIPTION
1	
2	
3	
4	
5	
6	
7	
8	
9	
{F} + Play	VCR VIEW. Selects the VCR as an input so that the VCR can be setup.
{F} + SEQ	SUMMER / WINTER TIME. Sets clock ahead 1 hour in April and back 1 hour in October

9.0 LIST OF SCHEDULED MACROS

DAY OF WEEK SETUP (See DATE/TIME MENU**) : MONDAY =** _____ (Typ. 1 or 2)

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			

10.0 SYSTEM CONFIGURATION