Multiplexer Technology Inc.

MTI-9CD & MTI-16CD Multiplexers

Operation Manual

Table of Contents

MTI-16CD Front Panel

Caution !!

In cases where the unit is subject to high voltage the potential exists for the unit not to operate properly. MTI Series products are designed to provide the maximum degree of protection from high voltage spikes, however not all situations can be accounted for.

Warning

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limit for a Class A computing device pursuant to subpart J of part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

C E
Compliant

Features

Color High Resolution Display and Recording
       NTSC   858 x 525 (pixels X lines)
       PAL 864 X 626 (pixels X lines)
Multi Image Display 1, 4, 9 or 16 pictures on screen
Rugged Metal Case approx. 1U Height
Full Duplex Operation for simultaneous recording and live multi-image monitor or VCR playback
True Video Motion Detection for Outdoor Applications with 3 Motion Parameters for alarming on unwanted movement.
       Object Size
       Sensitivity
       Object Tracking Time
       262,144 Detection Points with 288 Programmable Zones
       Night /Day Mode and Three Daily On/Off Timers
Simultaneous Video Activity Detection with sensitivity settings for increasing the camera update rate when movement in any camera is present.
Up to 16 Alarm Inputs either NO or NC
Alarm Output NO or NC
Interactive On-Screen Programming Password Protected
Auto Configure for PAL or NTSC
Power Input Voltage Free 100-240 VAC 50/60 Hz
Printer Port for Alarm Log, Image Printing or Digital Storage to a PC
Windows Software include for PC DVR Function
Compatible with Standard VHS or SVHS VCRs
2X Zoom with Screen Pan/Tilt function
3 Monitor Outputs 1 Digital and 2 Analog Call Monitors
Programmable Sequences and Salvos for Analog monitors
Four Daily Sequence Timers
Multi OSD Language Support
Video Loss Display and Alarm
Audible and Visual Alarm Responses
VCR Switcher Pulse Compatible
External Options Available
       Remote Keyboard RS-232 & RS-422

MTI-16CD Rear Connections
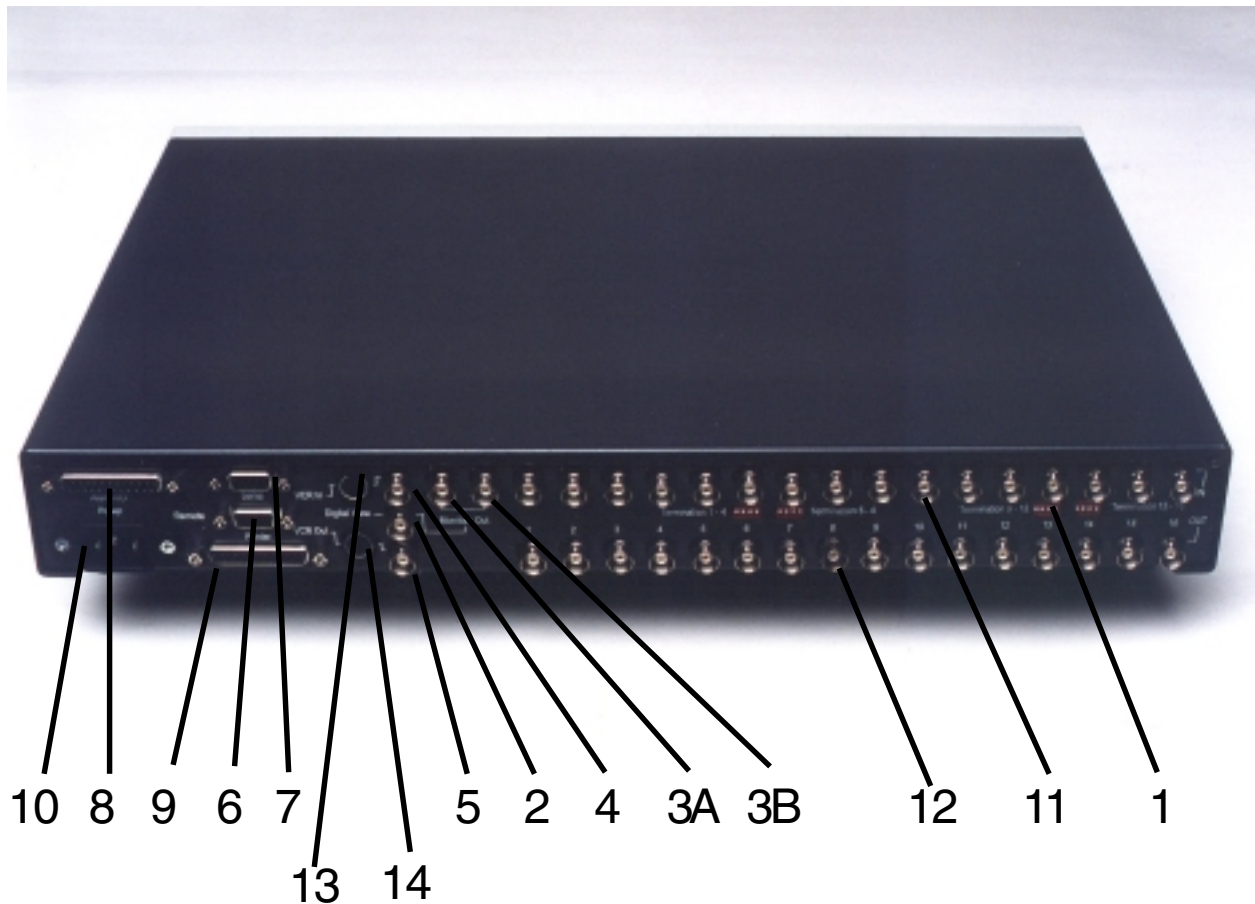
1) **Termination Switch (75 ohm terminate On/Off)**
2) **Digital View (Multi Image Display)**
3) **Analog Monitors (Call Monitors Full Screen Analog Only)**
   A) **Monitor A**
   B) **Monitor B**
4) **VCR In (Connects to VCR Output)**
5) **VCR Out (Connects to VCR Input)**
6) **Data Port (Optional Function Connector)**
7) **Serial Port (RS-232 for Remote Keyboard, Remote Control or Downloading)**
8) **Alarm I/O (X9 or X16 Alarm Inputs, Alarm Output, CS Pulse)**
9) **Printer Port (Centronics Standard)**
10) **Power (100-240VAC 50/60 Hz Voltage Free)**
11) **Camera Inputs X9 or X16 (1 V P-P Composite Video NTSC or PAL Auto)**
12) **Looping Connectors (Outputs when termination is OFF)**
13) **VCR Output SVHS (Connects to SVHS or Y/C Input on VCR)**
14) **VCR Input SVHS (Connects to SVHS or Y/C Output on VCR)**

Rear Panel Descriptions

1) **Termination**
    Proper terminations must be set for each camera. If the signal is "looped though" set the termination Off (down): if the signal is not looped through, set the termination On (up) which will terminate the video with 75 ohms.

2) **Digital View**
    The monitor connected here is referred to in this manual as the Digital Display. This monitor is required for viewing multiple camera images, VCR playback, and some programming functions.

3) **Analog Monitors**
    The monitor connection for Monitor A is the primary alarm output monitor, and is required for programming and for displaying sequences.

4) **VCR In**
    Be sure to connect the proper type of cabling, S-VHS or Composite, according to the type of equipment to be used. Do not connect both VCR inputs.

5) **VCR Out**
    Be sure to connect the proper type of cabling, S-VHS or Composite, according to the type of equipment to be used.

6) **Remote Port**
    When equipped with the optional card, this port accepts data from cash registers or ATM machines and overlays the data on the video image or supports PTZ domes.

7) **SerialPort**
    This connector accepts RS-232 inputs for external functional control or downloading programming from a computer or a remote keyboard.

8) **Alarm I/O**
    This connector contains:
    1) The **Alarm Inputs** which can be programmed N/O (normally open) or N/C (normally closed)
    2) The **Alarm Output** (N/O)
    3) The **Frame Gate Pulse Input or Camera Switcher Pulse** which allows the VCR to automatically change the rate of the multiplexer's frame switching.

9) **Printer**
    Standard Centronics parallel printer output. A PCL-5 printer is required to print video images. The Event Log will print to almost any standard printer, including dot matrix and inkjet printers.

10) **Power**
    Accepts power 100-240VAC 50/60Hz mains power source.

11) **Camera Inputs and Outputs**
    Without input for Camera 1 at power up, the unit will not function properly. At power up, the unit automatically configures itself for NTSC or PAL based on the input of Camera 1. Camera inputs must be composite 1V P-P NTSC or PAL.

Equipment Compatibility and Requirements

Cameras

Without Camera 1 input at power up, the unit will not operate properly. However the unit does need not to have all camera inputs to function properly. If cameras are added later, the unit must be re-scanned (see Programming, "Language / Format menu")

The inputs to all MTI multiplexers are fully time base corrected and can be used with non-synchronous cameras such as 12VDC cameras. The use of non-line lock cameras will not affect general performance, but may affect the recording and update rates of the frame switcher. For best results, use 24 VAC line-lock cameras.

The unit will accept color or B/W NTSC or PAL video signals.

Camera sync that does not conform to EIA, NTSC, CCIR or PAL standards will result in poor quality and may not be compatible with the operation of the equipment.

Pan/Tilt/Zoom (PTZ) cameras are not compatible with Video Motion Detection or Video Activity Detection. If you have PTZ cameras connected to the unit, be sure to turn off the Motion & Activity Detection for each PTZ camera. (see Programming, "Camera Settings")

Monitors

MTI multiplexers require two monitors for full featured operation, a Digital monitor and an Analog monitor. The Digital monitor can display various multiple camera views, and can freeze an image, zoom, then pan and tilt within the zoomed image. Analog monitors display camera sequences, alarm images, and programming menus.

VCRs

Multiplexers require a stable video signal to recover images from tape. Video tape recorders, by their nature, reproduce video with time base errors. As recorders age, this time base error increases and can adversely affect the ability to recover images from tape. Therefore, it is important that your recorder be properly maintained. Please refer to the maintenance schedule usually found in your recorder's operation manual.

MTI multiplexers are designed to recover images played back in the same speed that they were recorded in and at standard playback speeds. Playback in faster speeds other than 2hrs mode for NTSC and 3 hrs mode for PAL may results in lost images. Playback in x2,x3, Forward Scan or Reverse Scan will give varying result since the multiplexer will definitely miss images and display partial images with noise. However these modes are usefull in finding the area of interest and then change to normal playback speeds.

Some time lapse recorders insert an artifical sync pulse in playback speeds higher than real time. These pulses can cause distortion or loss of ability to recover images from tape. If this occurs adjust the tracking control on your VCR or some VCRs have a vphase adjustment on the rear of the unit that might need adjusting for a stable picture. Also, be sure to turn off any titling or annotation functions your VCR may have as not to degrade the multiplexer performance.

Terminations

MTI multiplexers allow termination to be set for each camera. Incorrect termination will degrade the quality of the signal and impair the unit's ability to record and recover images from tape. Make certain all video inputs that are not "looped through" are set to the 75 ohm termination position. The termination switches are located on the rear panel. (see Diagrams on pages 4,5,6) In some cases video cameras give higher or lower video levels than 1 V P-P +/- 20%. In this case the user must use amplifiers or attenuators to bring the video level to an acceptable level for recording.

Format: NTSC / PAL

During power up the unit will scan the Camera 1 input and automatically determine the format, NTSC or PAL. To change the format, power down the unit, replace Camera 1 input with the desired format camera, and power up the unit.

Printer

Printing images requires a PCL-5(A) compatible printer. The Event Log may be printed on almost any standard parallel ASCII printer, including dot matrix and inkjet printers. Please check that the printer is properly connected and powered, and is turned on. Also check the ink supply, toner, etc. if quality printing does not occur.

Serial Port

The serial port is used mainly for connection to the MTI remote keyboard. This unit can connect up to 100 ft away using standard RS-232 communication. For longer runs an optional RS-232 to RS-422 adapter will need to be fitted to the MTI multiplexer. The remote keyboard must then be selected for RS-422(4 wire) for runs up to 3000 ft. The MTI multiplexer also can be controlled by a PC proprietary system or other device. Full functional, upload and download commands are provided. See Appendix II.

Data Port

The data port is an optional port which can have various functions when the multiplexer is equipped with the appropriate internal daughter board.

Connections

Read carefully "Before Getting Started".

All units require at start up:
>   **1)** Input to Camera 1
>   **2)** A monitor connection to Mon A output
>   (for most Programming, and for viewing camera sequences)
>   **3)** A monitor connection to the Digital Display output
>   (for viewing multiple camera images, and for programming some features)

Connecting Components

First, connect all cameras, monitors, and VCR(s). Be sure each of these is properly connected, powered, and turned on. Be sure you have read the "Before Getting Started" section of this manual for compatibility and other requirements.

Note: Without video input into Camera 1 at power up, the unit will not function properly.

Connecting Power

Now, power up the unit. To ensure optimal performance, follow the instructions below the first time the unit is powered up.

Note: This does a master reset and erases all programming and resets the unit to the factory defaults.

>   **1)** Press and hold the **Zoom** and **Program buttons** simultaneously:
>   **2)** While holding these buttons, connect the power.
>   *The unit will beep three times. (Four times if the PAL format is detected)*
>   **3)** Release the buttons
>   *The Initialization Screen will appear briefly, then the following should occur:*
>   Maximum camera Digital Display (X4, X9, X16, depending on the unit)
>   Sequence 1 on Analog Monitor A (sequencing serially,1-max.,e.g. 9 channel 1-9)
>   Camera 1 on all other Analog Monitors
>   Lit LEDs indicating the status of the Digital Display and Cameras.

Following the above procedure completely resets the unit.

Note: If the unit does not beep, or it issues a continuous tone, the unit will not function properly. Power the unit down, wait a minute or so, then try again. If the unit still does not power up properly, contact your dealer or distributor.

MTI-16CD Front Panel
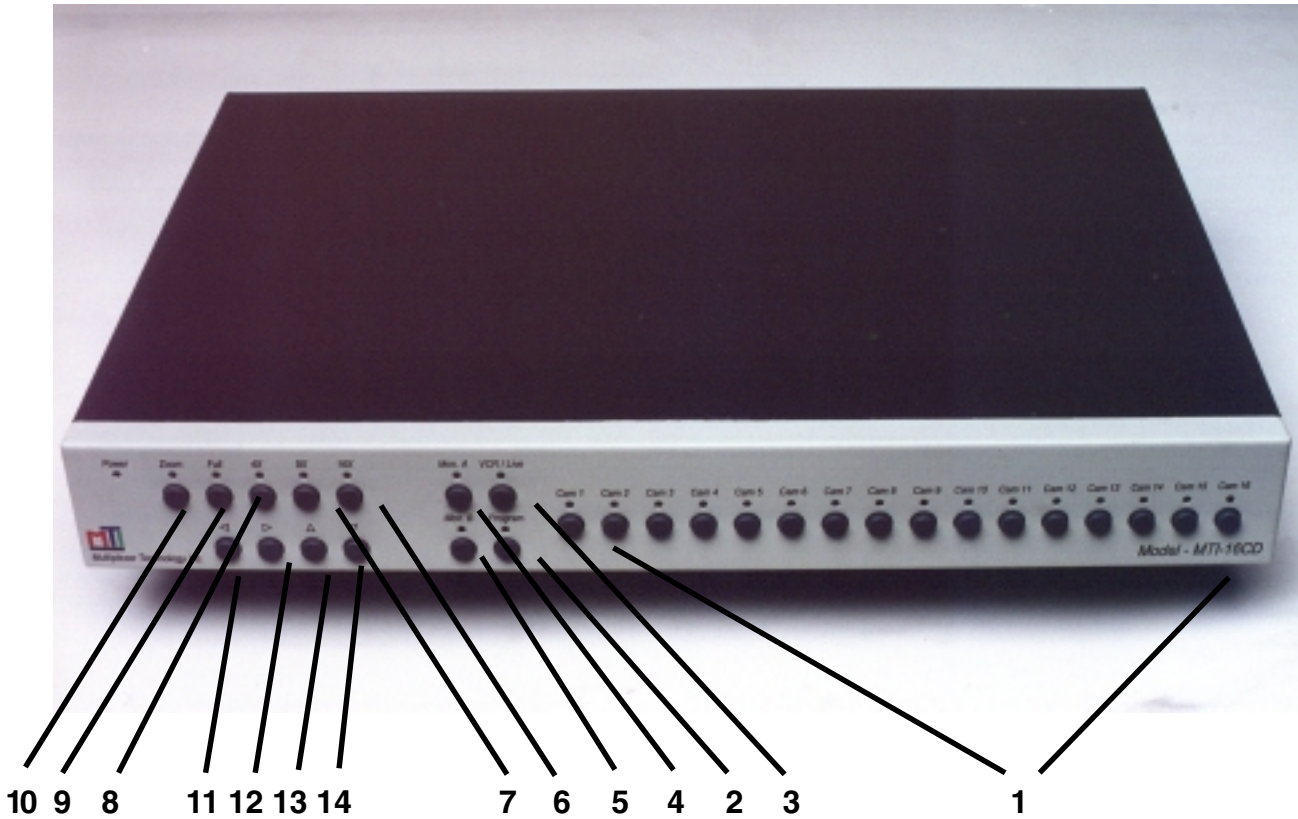
1) **Camera Select Buttons X9 or X16**
2) **Program Button**
3) **VCR / Live Control**
4) **Monitor A**
5) **Monitor B**
6) **X16**
7) **X9**
8) **X4**
9) **Full Screen Digital**
10) **Zoom / Freeze**
11) **Left**
12) **Right**
13) **Up**
14) **Down**

Program the Date, Time, and VCR Record Speed

Enter the Program Mode

1) Press the **Program** and **Zoom buttons** simultaneously.
You will see the Access Code Menu on the Analog Monitor A:
(Defaults are **underlined and bold**)

Enter Access Code

00　　**00**　　**00**　　**00**

EXIT

Note: If you wish, you may now enter an Access Code. To do so, simply follow the steps below in **2a**. You may enter the programming menus without creating a new Access Code, also shown below in **2b.**

2a) To enter a new Access Code:

Use the **Left** and **Right Arrow buttons** to move the cursor from one field to another, and the **Up** and **Down buttons** to enter values into these fields. You may also use the **Camera buttons** to enter values into these fields.

2b) To enter the programming menus without creating a new Access Code:

Use the **Right Arrow button** to move the cursor to EXIT *without changing the values shown* (00, 00, 00, 00).

IMPORTANT! Be sure to write down yor access code and put it in a secure place! The program menu cannot be accessed without it!

Note: If you forget your password refer to Section Connections and see Connecting Power

3) Move the cursor to EXIT, then press the **Program button**
(This will program the Access Code, if changed)

Page One of the Main Menu will now appear on Analog Monitor A.

Main Menu Page 1

Language
Date / Time
Alarm Display
Sequence Setup
Digital Display

Next Page

Set the Date and Time

1) Use the **Direction buttons** to move the cursor to DATE TIME.

2) Press the **Program button**

The Date / Time Menu will appear on Analog Monitor A
(Defaults are **underlined and bold**)

Format	**USA**, EUROPE
Style	**AM/PM**, MILITARY
Time	00:00 (default is last time set)
Day of Week	**SUN**, MON, TUES, WED, THU, FRI, SAT
Day	**01** (01-31)
Month	**01** (01-12)
Year	**01** (00-99)

Exit

4) Use the **Direction buttons** to move the cursor to FORMAT.

5) Move the cursor to the right-hand column. The **Up** and **Down Arrow buttons** will select the following format options: USA or EUROPE. ***The default is USA***.
  The USA format is: mm/dd/yy (month/day/year)
  The EUROPE format is: dd/mm/yy (day/month/year)
6) Select the desired format, then move the cursor back into the left-hand column.
7) Move the cursor to STYLE, then into the right hand column.
8) Use the **UP** and **Down Arrow buttons** to select AM/PM or 24-HR
The default is AM/PM
  The AM/PM setting displays the time in hours and minutes, up to 12:00
  with notation for AM or PM.
  The 24-HR setting displays the time in hours and minutes, up to 24:00 with
  no AM or PM notation.
9) After selecting the Style, return the cursor to the left-hand column.

Continue, as above. Move the cursor to the other Functions-TIME, DAY OF WK, MONTH, and YEAR and make the appropriate settings.

Note: The time will not update while programming. To ensure greater accuracy, you may wish to program the Time just before exiting the Programming Menus.

After all settings have been made in the Date / Time Menu, return to the Main Menu. Position the cursor anywhere in the right-hand column or at Main Menu, then press the **Program button**.

Set the VCR Record Speed

1) In the Main Menu, move the cursor to NEXT PAGE, then press the **Program button**.

Page 2 of the Main Menu will be displayed

<u>Main Menu Page 2</u>

Camera Settings
Record Mode
Sequence Timers
FST Times
Log / Printout
Exit

2) Move the cursor to RECORD MODE and press the **Program button.**

The RECORD MODE Menu will be displayed:
(Defaults are <u>**underlined and bold**</u>)

<u>Record Mode Menu</u>

Rate Type	**HOUR**, FIELD
Normal	**24 HR** (0-65,334HR)
	7 FLD (0-65,344FLD)
Alarm	**2 HR** (NTSC)
	3 HR (PAL)
	0 FLD (no delay)
VCR Type	**COMP**, S-VHS
Main Menu	

Note: If connected, the VCR Gate Pulse will control the Record Rate. Consult you VCR's Owner's Manual.

1) Select the Rate type, HOUR or FIELD DELAY. Consult your VCR's Operation Manual, if needed.
2) Select Normal and Alarm record speeds, if needed.
3) Select the VCR type.
4) Move the cursor to Main Menu, then press the **Program button**
5) Move the cursor to Next Page, then press the **Program button**
6) Move the cursor to Exit, then press the **Program button**
The unit will take a few moments to process the new programming.

Millennium multiplexers are normally controlled by the front panel buttons and internal timers. Most functions require only the push of a button. However, some require that a sequence of buttons be pushed, and a few functions require simultaneously pressing two buttons. The following sections will explain how to operate Millennium multiplexers.

Digital Display

Single Camera Display / Multiple Camera Display / Freeze / Zoom / Pan and Tilt

Note: On start up the unit will display a maximum camera view on the Digital Display. On multiple camera views, cameras without input will be displayed as black.

Single Camera Displays

To view a single camera on the Digital Display, simply press the **Full button**, then the desired camera's button. The Digital Display will show that camera in Full view.

Note: The currently active Analog Monitor will also change: any sequencing on that monitor will be interrupted.

The number and type of views available depend on the unit:
  4 channel units: One Full and One Quad view
  9 channel units: One Full, Two Quad views, and One 9 camera view
  16 channel units: One Full, Four Quad views, Two 9 camera view, and One 16 camera view.

The information below applies to 4, 9, 16 channel units within the above specifications.

Multiple Camera Displays

Quad Displays

All units
Press the **X4** button. The Digital Display will show a quad view (Cameras 1-4)

9 Channel Units
Press **X4 button**. The Digital Display will show a quad view (Cameras 1-4)
Press **X4 button** again to show a second quad view (Cameras 5-8)
Press **X4 button** again to show a third quad view (Cameras 9, 1, 2 and 3)
Press **X4 button** again. The Digital Display will sequence through it quad views.
Press **X4 button** again. The Digital Display will return to the first quad view.

Note: These views can be configured to show any four cameras on any quad view.

16 Channel Units
Press **X4 button**. The Digital Display will show a quad view (Cameras 1-4)
Press **X4 button** again to show a second quad view (Cameras 5-8)
Press **X4 button** again to show a third quad view (Cameras 9 -12)
Press **X4 button** again to show a fourth quad view (Cameras 13-16)
Press **X4 button** again. The Digital Display will sequence through it quad views.
Press **X4 button** again. The Digital Display will return to the first quad view.

Note: These views can be configured to show any four cameras on any quad view.

Nine Camera Displays

<u>**9 Channel Units**</u>
Press **X9 button**. The Digital Display will show a 9 camera view (Camera 1-9)

<u>**16 Channel Units**</u>
Press **X9 button** to show a 9 camera view (Camera 1-9)
Press **X9 button** again to show a second 9 camera view (Cameras 10-16, 1, 2)
Press **X9 button** again. The Digitial Display will sequence the 9 camera views.
Press **X9 button** again. The Digital Display will return to the first 9 camera view.

Note: These views can be configured to show any nine cameras on any 9 camera view.

Sixteen Camera Display

<u>**16 Channel Units**</u>
Press the **X16 button**. The Digital Display will show a 16 camera view (Cameras 1-16)

<u>Freeze, Zoom, and Pan and Tilt</u>

You may freeze an image on the Digital Display in Live Mode or VCR Playback. You may Pan and Tilt within any 2X image in Freeze Mode, VCR Playback, or Live.

Freeze

To Freeze the Digital Display, press the **Zoom button** once. The image on the Digital Display will "freeze". This is the same for both Live and VCR Playback.

To "unfreeze" the image, press the **Full button**. Again, this is the same for both Live and VCR Playback.

Zoom

While in Freeze Mode, pressing the **Zoom button** a second time will digitally Zoom the image 2X. Then press the **Arrow buttons** to Pan and Tilt within the zoomed image. Also, pushing any of the Arrow buttons while in Freeze Mode or Live results in the Digital Display changing to a 2X view.

While in Freeze Mode, the **Zoom button** will toggle between full sized and 2X "frozen" images.

Pan and Tilt

To Zoom and Pan and Tilt while viewing a Live "unfrozen" images, simply press any of the arrow buttons. The image will automatically Zoom to 2X and allow you to Pan and Tilt within the image by using the arrow buttons. To return to Full view, press the **Full button**.

Analog Monitors

"Spot" operation / sequencing

Millennium multiplexers' programmable Analog Monitors can display any camera at any time, and feature user programmable sequencing. Analog Monitor A is the "Call Monitor"; it displays alarm images when an alarm is triggered. On some units, Salvos may also be displayed; these allow the monitors to act in concert, sequencing sets of images on several monitors at one time.

On start up, the unit will show Sequence 1 (Camera 1-max., serially) on Monitor A; all other Monitors will display Camera 1.

Single Camera Display

To select a Camera to an Analog Monitor:
      1) Press the **Monitor A** or **Monitor B button**
      2) Next, press the desired **Camera button**
This will "spot" the selected Camera to the Monitor selected in the previous step.

Note: Any sequences will pause. To resume the sequence, press the same camera button again.

Sequences

To select a Sequence to an Analog Monitor A:
      1) Press the **Monitor A** and simultaneously press the **Program** button.
      Camera buttons 1-4 will light, representing the available Sequences, 1-4
      3) Press a lit **Camera button**
This will assign the represented Sequence to the Monitor selected in the previous step.

To select a Sequence to an Analog Monitor B:
      1) Press the **Monitor B** and simultaneously press the **Program** button.
      Camera buttons 1-4 will light, representing the available Sequences, 1-4
      3) Press a lit **Camera button**
This will assign the represented Sequence to the Monitor selected in the previous step.

Event Log

Viewing / Printing / Clearing

The Millennium multiplexers can print the Event Log at any time, to nearly any standard parallel printer. The unit can also be programmed to print the Event Log once every 24 hours at a user selected time. (see Programming, "Log / Printer Menu" for more)

The Event Log stores up to 100 entries. When full, the Event Log will begin eliminating the oldest entries to make room for the most recent ones.

Viewing the Event Log

1) Press the **Program** and **Camera 1 buttons** simultaneously.
The Event Log will appear on Analog Monitor A

2) The following codes are used in the Event Log:

C01 = Camera 1 (C05 = Camera 5; C12 = Camera 12; and so on)
　　　PL = Power Loss
　　　PR = Power Recovery
　　　VL = Video Loss (Followed by the Camera number)
　　　VR = Video Recovery (Followed by the Camera number)

　　　Each entry also includes the Date and Time

3) Scroll through the Event Log by using the **Up** and **Down Arrow buttons**

4) To exit the Event Log, press the **VCR / Live button.**

Note: The Log cannot be printed while it is being viewed. (see directions below)

Printing the Event Log

Printing On Demand

1) Press the **Program** and **Camera 2 buttons** simultaneously.
The entire Event Log will print

Note: The Event Log can also be printed automatically every 24 hours at a pre-selected time. (See Programming, "Log / Printer Menu" for more).

Clearing the Event Log

1) Press the **Program** and **Camera 4 buttons** simultaneously.
The Security Code screen will appear on Analog Monitor A. This is the same Security Code used to enter the Programming Menu.

2) Enter the Security Code and select EXIT to clear the Event Log.
The unit will resume normal operation.

Printing Images

Images on the Digital Display may be printed in any view. Full, X4, X9 or X16 (depending on the unit). Images may be printed in Live Mode or during VCR playback.

Images may be printed at almost anytime, except during programming, or before a prior image is finished printing. Digitally "zoomed" images will not print; if selected the image will print as a normal, full screen view.

> **1)** To print the Digital Display, press the **Program** and **Camera 3 buttons** simultaneously. ***The Digital Display will print.***

Note: While printing is in progress, the Digital Display will be blank for approximately 90 seconds.

VCR Playback

To view VCR playback, press the **Live / VCR button**; when lit, the unit is displaying images from the VCR.

During VCR playback, any Digital Display may be selected; an individual camera or any multiple camera view may be displayed. The digital pan, tilt, zoom, and print functions all operate as in Live Mode.

Note: VCRs vary widely in specifications, operation, and features. Be sure to carefully review your VCR Owners Manual before recording or playing back. Also review the compatibility issues in "Before Getting Started".

Alarms

Intrusion / Video Loss / Video Recovery / Power Loss / Power Recovery

Intrusion

When an alarm occurs:

> **1)** The associated camera buttons' LED will flash rapidly
> **2)** The video from the alarmed camera will appear on Analog Monitor A
> **3)** The alarm will be recorded in the Event Log
> **4)** The Alarm Output will "close" for the programmed Alarm Duration

In addition, depending on the configuration of the unit, any or all of the following may occur:

> **1)** An alarm message may appear on Analog Monitor A (the message will be recorded to tape)
> **2)** An audible alarm may sound
> **3)** The Digital Display will change to the setting in the Alarm Digital Display menu
> **4)** The alarm image will print
> **5)** Alarm Annotation will appear on all monitors displaying the alarmed camera.

To acknowledge the alarm, simply press the **Camera button** that is flashing.

Acknowledging the alarm when Manual is selected in the Alarm Display Menu.

>   **1)** Ends the audible alarm
>   **2)** Removes the alarm annotation from the Digital Display, and ends the camera LED's flashing.

Note: The camera will still be recorded to tape for the entire Alarm Duration set in Camera Settings Menu.

Acknowledging the alarm when Automatic is selected in the Alarm Display Menu:

>   **1)** Ends the audible alarm
>   **2)** Ends the camera LED's flashing

Note: The camera will still be recorded to tape and the alarm annotation will be displayed for the entire Alarm Duration set in Camera Setting Menu.

Video Loss

If the video signal from a camera is lost:

>   **1)** The unit will sound an audible alarm for the time set in Alarm Duration.
>   **2)** The Digital Display will show a "Video Loss" message for that camera.
>   **3)** The Analog Monitor will show a "Video Loss" message.
>   **4)** A Video Loss entry will be entered in the Event Log.

Video Recovery

When a video signal is recovered, the picture will reappear in its proper place on all monitors, and an entry will be made in the Event Log.

Power Loss and Power Recovery

Power Loss and Power Recovery are entered in the Event Log. The unit's internal clock will maintain all programming, including date and time, for appoximately 36 hours.

Programming

In General

Millennium multiplexers are ready to use with only minimal set up required. The settings in "Getting Started" are sufficient for basic operation.

If you have not set up the unit following the guidelines in "Getting Started" please do so before continuing in this section. It is also important to familiarize yourself with the operation of the unit before attempting any programming. (see "Operation") Then, please be sure to carefully preview the information that follows before accessing the Program Mode.

Entering Program Mode temporarily suspends normal operation of the unit
The Digital Display will "freeze", and all functions not related to Program mode will cease - including recording - until the Program Mode is exited. When Program Mode is exited, changes may take a few moments to download; during this time, the unit will remain "frozen". When this download is complete, the unit will resume normal operation; recording will resume according to the new programming, the Digital Display will show its maximum camera view, and the Analog Monitors will follow new programming or resume the programming assigned to them prior to programming.

Understanding Menus

The information in the Program Mode is presented in a series of Menus and Submenus. Most of these appear as text on a single screen. However, in some cases a single Menu or Submenu may continue for two or more screens.

Note: All Programming Menus as shown in the Programming Tree Diagram on Page 47.

In general, Menus are displayed as two columns of text in which the left hand column contains programmable functions, and the right hand column contains settings. The **Arrow buttons** will move the cursor to enable selection of menus, functions, and their associated settings. The **Program button** is used to make selections.

Note: Here and throughout this manual, defaults are shown **underlined and bold**: special notes and ranges for settings are in parenthesis.

Example: ***The Date/Time Menu***

Format	**USA**, Europe
Style	**AM/PM**, Military
Time	00:00 (defaults is last time set)
Day of Week	**SUN**, MON, TUE, WED, THU, FRI, SAT
Day	**01** (01-31)
Month	**01** (01-12)
Year	**01** (00-99)
Main Menu	

Selecting Programming Functions

When the cursor is in the left hand column, use the **Up** and **Down Arrow buttons** to select a function. Once the desired function is selected, use the **Right Arrow button** to move the cursor into the right hand column. When the cursor is in the right hand column, use the **Up** and **Down Arrow buttons** to change the settings. Once the desired settings are achieved, use the **Left Arrow Button** to move the cursor back into the left hand column. Any number of functions can be set while in a Menu.

Some functions are followed by a right arrow. In these instances, there is no visible "right hand column." For some function, pressing the **Right Arrow button** will display another screen, as in setting Activity or Motion Detection Zones. For others, this will accomplish the function being programmed, as in resetting a Default.

For menus that have a camera number at the top of the screen, the camera number can be changed by pressing any other **Camera button** when the cursor is in the left hand column. The programming "page" will then become the page for the newly selected camera. Because each camera has many options, it is often easier to program all cameras for a given page rather than go through all menus for one camera, then go through them again for another.

After all desired functions in a particular menu have been programmed, there are two ways to exit the menu and put the settings into effect:

> **1)** Move the cursor to the left hand column and press the **Program button**: this will save the settngs and return to the Main Menu. However, the new programming will not take effect until EXIT is selected from the Main Menu.
> **2)** Move the cursor to the bottom of the screen and select NEXT PAGE or MAIN MENU (depending on the menu).

Again, please preview carefully the information in this manual before accessing Program Mode.

Main Menu Settings
The Main Menu Pages

This menu has 2 screens, as shown below:

Main Menu Page 1	**Main Menu Page 2**
Language	Camera Settings
Date / Time	Record Mode
Alarm Display	Sequence Timers
Sequence Setup	FST Timers
Digital Display	Log / Printout
Next Page	Exit

To access a particular menu, move the cursor to the desired menu, then press the **Program button.**

Language and Format Settings
THE LANGUAGE / FORMAT MENU

Unit ID Code   <u>000</u>
Language   **ENGLISH** (Francais, Duetsch)
Format   **NTSC** (PAL)
System   Set Dflt>
Rescan>
Main Menu

Unit ID

The unit IC is used for remote communication equipment. This allows up to 999 units to be connected to the same communication line and the host computer address each unit individually. Refer to Section   for further details. The default is 000.

Language

The language selected here affects all programming menus.

Format

This displays the format detected by the unit at start up. The format cannot be changed. To change the format, the unit must detect the desired format at the input of Camera 1 at start up.

System

Select Set Dflt resets the unit to factory defaults. All programming will be reset.

Rescan

Select Rescan if cameras are added after power up. Cameras added after power up will only be acknowledged if this function is selected.

Note: Any time the unit is powered up, it will scan all camera inputs. If cameras are added after power up, re-powering the unit will ensure that the new cameras are accepted.

Date and Time Settings
THE DATE / TIME MENU

Please refer to "Getting Started" for setting the Date and Time.

Configuring the Alarm Display
THE ALARM DISPLAY MENU

Display	**ON**, OFF
Number of Pix	1, **4**, 9, 16
Annotate Alarm	**YES**, NO
Clear Alarm	**MANUAL**, AUTO
Position Alarm	>
Main Menu	

Alarm Display

This function determines whether an alarm will display on the Digital Display. If YES is selected, the Digital Display will show the alarm in the configuration selected in Number of Pix.

Note: Alarms will always show on Analog Monitor A (the "Call Monitor")

Number of Pix

This sets the number of images shown on the Digital Display when an alarm has been triggered. On all multiple camera views, the first image (the upper left hand corner) will be the alarm image. All images following will be one second update images of the alarm camera. The Number of Pix can be set to 1, 4, 9, or 16 on any unit , **regardless of the number of camera inputs.**

Annotate Alarm

Selecting YES will display, Alarm Annotation on-screen and to tape when an alarm is triggered. Selecting NO will cause the unit to only audibly alarm (if enabled) and flash the triggered camera's LED. All alarms are noted on the Event Log, regardless of the setting chosen for Annotate Alarm.

Clear Alarm

If MANUAL is selected, the unit will display Alarm Annotation until the alarm is manually acknowledged (by pressing the triggered camera's button) If Auto is selected, the unit will display Alarm Annotation for the duration of the alarm dwell time, whether it is manually acknowledged or not. Annotation on-screen and to tape will follow the duration of the alarm according to the Clear Alarm Setting.

Position Alarm

If selected, the alarm message will appear on Analog Monitor A. Using the Arrow buttons, the message can be positioned anywhere on the screen. The positioning is global, and will be the same for all cameras. Once the desired position is achieved, to save the alarm message position and return to the Alarm Display Menu, press the Program Button.

Notes:

1) When enabled, the Alarm Digital Display will show alarm images on the Digital Display in place of Live or VCR Playback images. Until cleared, only the first alarm in a sequence of alarms will be displayed.

2) To clear the Alarm Display, press any digital View (e.g., Full, X4, X9, etc)

3) If Number of Pix is greater than 1, the Digital Display will show the alarm image at 1 second updates of the same camera, until the screen is filled with the programmed number of images.

4) The unit will automatically reset to maximum camera view if an Alarm Image is automatically printed.

Programming Sequences
THE SEQUENCE SETUP MENU

This menu is used to program up to 4 different camera sequences. Once programmed, each sequence can be assigned at any time to any Analog Monitor. Sequences can be assigned on demand by front panel buttons or set to run automatically by programming the Sequence Timers Menu.

Sequence **01** (01-04) Setup

Cameras Section

01	**02**	**03**	**04**	**05**	**06**
07	**08**	**09**	**10**	**11**	**12**
13	**14**	**15**	**16**		

Main Menu

Notes:

1) The number of cameras available for a given sequence is equal to the number of camera inputs for each unit. For example, 4 channel units allow four cameras per sequence; 16 channel units, sixteen per sequence.

2) Cameras may be repeated within a sequence, and not all positions within a sequence need be assigned.

Programming Sequences

1) Assign the sequence a number, 1, 2, 3 or 4 in the field following SEQUENCE.
Use either the Direction buttons or the Camera buttons to enter a number.

2) Assign cameras, in any order desired, to the sequence.
The fields following CAMERAS SECTION can be assigned using either the Direction buttons or the Camera buttons.

Notes:

1) A field with 00 will have no camera assigned to it and will be ignored, the unit will show only assigned cameras.

2) Cameras not connected will not display any screen during sequences.

Setting and Adjusting the Digital Displays
THE DIGITAL DISPLAY MENU

This menu programs various views available on the Digital Display, the dwell time between these views, and some adjustments. This menu requires both a Digital Display and an Analog Monitor A.

Dwell Time	**00:05**	(00:00 - 10:59)
Set Display>		
Default>		
Contrast	**216**	(0-255)
Brightness	**128**	(0-255)
Saturation	**320**	(0-512)
Hue	**128**	(0-255)
Main Menu		

Setting the Digital Display Dwell Time

1) Move the cursor to DWELL TIME, then to the right hand column.
2) Use the Arrow buttons to set the desired dwell time.

This dwell time affects only the rate of the Digital Displays when they are sequencing (e.g. quad switching and 3x3 switching) The Analog Monitors are unaffected by the settings in this menu.

Descriptions of the Digital Displays

4 channel units have one quad display that can be programmed. 9 channel units have three 4 camera displays and on 9 camera display that can be programmed. 16 channel units have four 4 cameras displays, two 9 camera displays, and on 16 camera display all of which can be programmed.

The defaults for 9 Channel units are:

First 4 camera display - cameras 1-4
Second 4 camera display - 5-8
Third 4 camera view - 9, 1-3
The 9 camera display is set to 1-9, and is also programmable

The defaults for the 16 Channel units are:

First 4 camera display - cameras 1-4
Second 4 camera display - 5-8
Third 4 camera view - 9-12
Fourth 4 camera view - 13-16
First 9 camera view - 1-9
Second 9 camera view - 10-16, 1, 2
The 16 camera view is set to 1-16, and is programmable

Setting the Digital Displays

First, move the cursor to SET DISPLAY, then press the **Right Arrow button.**
You will now use the Digital Display buttons, X4, X9, and X16 (as available) and the Camera buttons.

Quad Views

Note: When programming any Digital Display, press the **Program button** to program the settings and return to the Digital Display Menu.

All units

1) Press the **X4 button**. The Digital Display will show a 4 camera view
2) Use the **Arrow button** to highlight the quadrant to be changed.
3) Press any **Camera button** to assign it to the selected quadrant.
4) Repeat these steps for the remaining quadrants.
5) Press the **Program button** to return to the Digital Display Menu.
This concludes programming Digital Displays for 4 channel units.

For 9 and 16 Channel Units

1) Follow the above steps, 1-4
2) Press the **X4 button** again
The Digital Display will show a second 4 camera view.
3) Quadrants may be changed as described above.
4) Press the **X4 button** again.
5) The Digital Display will show a third 4 camera view
6) Quadrants may be changed as described above
This finishes programming this menu for 9 channel units.
To return to the Digital Display Menu, press the **Program button.**

For 16 Channel Units

Continue the above steps to assign cameras to the fourth 4 camera views. After the fourth 4 camera view is programmed, press the **X4 button** again or press the **Program button** to return to Digital Display to the first 4 camera view.

9 Camera Views

9 and 16 Channel Units

1) After entering the Set Display mode as described above.
2) Program the 9 camera views by pressing the **X9 button.**
The Digital Display will show the first 9 camera view
3) Move the cursor to the desired section, then press a **Camera button** to assign that camera to the section.
4) Repeat until all desired sections are assigned.
5) Press the Program button to finish and return to the Digital Display Menu.
This concludes programming Digital Display for 9 Channel Units

1) Press the **X9 button** again.
The Digital Display will show the second 9 Camera View
2) Repeat the steps above to assign cameras to the sections in this view.
3) Pressing the **X9 button** again returns the Digital Display to the first 9 camera view.

To return to the Digital Display Menu, press the **Program button.**

Defaults

This returns the unit to the default Contrast, Brightness, Saturation, and Hue settings.
1) Position the cursor on Defaults
2) Press the Right Arrow button
The values for Contrast, Brightness, Saturation, and Hue will return to their factory defaults.

Contrast, Brightness, Saturation, and Hue Settings

To compensate for special lighting conditions and other situations, the unit offers global adjustments for Contrast, Brightness, Hue and Saturation. All of these adjustments are made as follows:

1) Select the desired adjustment, then press the **Right Arrow button.**
The Digital Display will change to a quad view.
2) Use the **Up** and **Down Arrow buttons** to change the values for the adjustment.
3) When the adjustment is finished, press the **Program button.**
The Main Menu will be displayed.

Note:
1) Analog Monitors are unaffected by these settings
2) These settings affect recording to the tape and the Digital Display. Be sure to change values incrementally, and check in VCR mode after exiting Programming.
3) On Monochrome units, the Digital Dispaly will not be affected by the Hue and Saturation settings.
4) In the PAL mode, the Hue control has no effect.

Camera Settings
THE CAMERA SETTING PAGE

The Camera Settings Menu is actually a series of menus. Because the Millennium multiplexers are designed to offer maximum flexibility and control, each camera has many programming options. It is important to plan the configuration of your system before setting up these menus. Also, please carefully preview the information below before accessing the Camera Settings Menu.

Note: At the top of each "page" of the Camera Menu, the Camera Number is displayed. Move the cursor to the left hand column and press any Camera button to change that camera's settings. It is sometimes easier to program each camera for a given page, before moving to another page in the Camera Menu.

Camera Alarm Settings Page

Note: This menu will display VIDEO PRESENT or VIDEO NOT PRESENT, to identify the condition of the camera selected for programming. This condition is based on the camera connections at the time the unit is powered up . If a camera displays VIDEO NOT PRESENT, it **can not** be selected at PRESENT. Cameras added after power up will display NOT PRESENT until the unti is re-scanned (See Language / Format Menu)

Cameras that display NOT PRESENT will not appear on monitors and will not be recorded to tape.

Camera	**01** Settings	
Video	**PRESENT**	(Not Present)
Alarm Input	**OFF**	(MD, HC, BOTH, OR)
Alarm Type	**N/O**	(N/C)
Buzzer	**OFF**	(ON)
Alarm Duration	**00:04**	(00:00 - 04:59)
Dwell Time	**00:04**	(00:00 - 04:59)
Next Page		

Setting The Alarm Input

This setting determines the conditions necessary for the camera to alarm. If OFF is selected, neither motion detection nor contact can trigger an alarm for that camera. MD will alarm only from motion detection, HC will alarm only from a hard contact alarm. OR will alarm if *either* motion or hard contact alarm is detected.

Notes:
    1) Units without Video Motion Detection: Only HC and OFF are valid settings.
    2) BOTH will only alarm if both types of alarms are triggered simultaneously.

Setting the Alarm Type

This setting determines how each camera responds to an alarm input. For example, a door contact that alarms on opening should be set in this menu to N/C (Normally Closed).

Setting the Buzzer

The audible alarm can be set ON or OFF. If set to OFF, the unit may still alarm , but no audible alarm will result. If set to ON, an audible tone will sound for the Alarm Duration each time alarm criteria are met for the selected camera. The buzzer will sound on Video Loss, regardless of the settings here. ON/OFF and Duration are set for each camera.

Setting the Alarm Duration

This setting determines the length of time an alarm will be recorded to tape, regardless of when it is acknowledged. For example, if the alarm duration is 10 seconds, but the alarm is acknowledged after only 5 seconds, the audible alarm will cease, yet the alarmed camera will continue to be recorded to tape for the full 10 seconds.

The duration of the Alarm Annotation is determined in part by the setting for "Annotation", in the Alarm Settings Menu. If Manual is selected, the on-screen annotation will cease whenever the alarm is manually acknowledged. If Automatic is selected, the annotation will continue for the Alarm Duration programmed here, regardless whether it is manually acknowledged.

Setting the Dwell Time

The Dwell Time is the amount of time each alarm will appear on the Analog Monitor A (the "Call Monitor") during multiple alarms.

This setting is independent for each camera, and also determines:
> **1)** How long the camera is displayed during sequences. Each camera can be configured differently.
> **2)** How long the camera is displayed on the "Call Monitor" during multiple alarms.

Note: When the desired Dwell Time is set, use the Left Arrow button to move the cursor into the left hand column. Do not press the Program button while the cursor is in the right hand column.

Configuring the Time and Title
TIME/TITLE PAGE

This portion of the Camera Menu programs the display and positioning of each camera's time, date, and title. In this menu, "Time" refers to time and date.

Camera	**01** (1-4, 1-9, or 1-16, as available)
Display Time	**YES**, (NO)
Position time>	
Outline Text	**NO,** YES
Display Title	**YES**, (NO)
Edit Title>	
Position Title>	
Next Page	

Note: The defaults on all cameras are: Display Time, YES; Display Title, YES; The default position for each is the lower right hand corner of the screen.
Note the Camera number at the top of the screen. Make sure the camera being programmed is the desired camera. To change the camera being programmed, position the cursor in the left hand column, and press the desired **Camera button.**

Positioning Time / Date and Titles

1) Select whether the time/date or title will be displayed by selecting YES or NO in the appropriate position.
2) Move the Cursor to POSITION TIME, then press the **Right Arrow button**. The screen will change to show video from the camera being programmed.
3) Use the **Arrow buttons** to position the Time/Date.
4) When the text is in the desired position, press the **Program button** to program the new positioning.
To position Titles, repeat the above steps, beginning with the cursor positioned at POSITION TITLE.

Outline Text

When this option is set to YES there will be a black border outlining all white on-screen text for that selected camera. This allows the text to be read regardless of the video background. However when enabled the text is difficult to read while in the 9 and 16 camera multiscreen display mode.

Editing Titles

Note the Camera number at the top of the screen. Be sure that the camera being programmed is the desired camera.

1) Move the cursor to EDIT TITLE, then press the **Right Arrow button.**
The screen will change to show video from the camera being programmed.
2) Use the **Left** and **Right Buttons** to move the cursor from space to space within the text field. Use the **Up** and **Down Arrow** buttons to change the character in each

position.

> ***The default title for each camera is the word "Camera" followed by the camera number.***

The following characters are available for each position in the title text field. Starting from "A" using the Up Arrow button shows the following characters in this order.
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz[space].-,/
0123456789:<*>_

Notes: When selecting a space, the cursor "disappears"

The tile may contain a total of twenty characters.

Programming Activity Detection
THE ACTIVITY DETECTION PAGE

This menu programs the Activity Detector. When enabled, priority in the frame-switcher output sequence will be given to cameras with activity, recording these camera to tape more frequently.

For example, on a 9 channel unit with valid camera input on all cameras, the normal recording sequence is Cameras, 1,2,3,4,5,6,7,8,9. If activity were detected on Camera 3, the sequence would change to 1,3,2,3,4,3,5,3,6,3 etc., until activity is no longer detected. All cameras with activity are given this level of priority.

Note the Camera number at the top of the screen. Make sure the camera being programmed is the desired camera. To change the camera being programmed, position the cursor in the left hand column, and press the desired **Camera button.**

Note: This menu is not available on units without Video Motion Detection.

Camera	**01**
Activity Det	**ON** (OFF, REC OFF, ONLY)
Activity Set Zone>	
Activity Sensitivity	**50** (0-99)
Next Page	

Setting the Activity Detection

1) Move the cursor to ACTIVITY DET, then into the right hand column

2) Use the **Up** and **Down Arrow buttons** to select ON, OFF, REC OFF, or ONLY

ON enables the Activity Detection. It will function as described above.

OFF allows the camera to be recorded to tape in the normal recording sequence.

Activity will not effect the rate at which the camera is recorded to tape.

REC OFF removes the camera from all recording sequences. The camera will not be recorded to tape.

ONLY will cause the camera to be recorded only when activity is detected.

Note: At least one Camera must be set to either ON or OFF.

Setting the Activity Detection Zones

1) Move the cursor to ACTIVITY SET ZONE, then press the **Right Arrow button.** *The screen will change to show video from the camera being programmed, and the Zone Pattern will be overlaid on the view.*
2) Use the Direction buttons to position the cursor and the **VCR/Live button** to change Zones from Active to Inactive.
3) *Active Zones appear as normal video. Inactive Zones are overlaid in white.*

When all Zones have been programmed, press the **Program button** to return to the Menu.

Note: The default is all Zones active.

Programming Motion Detection
THE MOTION DETECTION PAGE

This menu programs the Video Motion Detection settings independently for each camera.

Notes:
1) Note the Camera number at the top of the screen. Make sure the camera being programmed is the desired camera. To change the camera being programmed, position the cursor on the number following "Camera" and press the desired **Camera button.**
2) Units without Motion Detection will not have this Menu.
3) This menu allows each camera to have optimal motion detection zones. Be sure that any unwanted movement is blocked out, including potential movement, such as trees which may only move when there is wind. Also note that changes in lighting may trigger the motion detection; signs or phones with flashing lights may need to be blocked out.
4) For Motion Detection to function, the INPUT ALARM setting in "Camera Settings Menu" must be set to MD, BOTH, or OR.

IMPORTANT !!!
Because each application is unique, some experimentation is normally required to find the proper settings for Zones, Sensitivity, and Trigger Level. It is best to perform a "walk through" test - create various conditions within the camera view to adjust the settings to ensure that they: 1) trigger the alarm when desired
                                                                      2) do not trigger false alarms.

Note: The default for each camera is all Zones active; this will display as a clear screen.

Camera	**01**	
Motion Set Zones>		
Day Motion Settings		
Sensitivity	**50**	(0-99)
Trigger Level	**500**	(0-65,535)
Next Page		

Setting the Motion Detection Zones

1) Move the cursor to MOTION SET ZONE, then press the Right Arrow button.
The screen will change to show video from the camera being programmed.
The zone Pattern will be overlaid on the view.
2) Use the Arrow buttons to position the cursor and the VCR/Live button to change Zones from Active to Inactive.
Active Zones appear as normal video. Inactive Zones are overlaid in white.
3) When all Zones have been programmed, press the Program button to return to the Menu.

Setting Motion Detection Sensitivity And Trigger Level

1) Move the cursor to SENSITIVITY
2) Move the cursor to the right hand column
3) Use the **Up** and **Down Arrow buttons** to select the desired Sensitivity, 0-99.
The default SENSITIVITY is 50. 99 is the most sensitive; 0 is the least.
4) After the desired Sensitivity is selected, move the cursor back into the left hand column.
5) Move the cursor to TRIGGER LEVEL, then into the right hand column.
The Trigger Level determines the size of the object necessary to trigger an alarm.
The larger the number, the larger the object must be to trigger an alarm.
6) Use the **Up** and **Down Arrow buttons** to select the desired Trigger Level.
The default TRIGGER LEVEL is 500
7) After the desired Trigger Level has been selected, use the **Left Arrow button** to return the cursor to the left hand column.

Program other cameras by changing the Camera number at the top of the screen, or leave this Menu by moving the cursor to NEXT PAGE and pressing the **Program button**.

Programming Night Motion Detection Settings
THE NIGHT MOTION SETTINGS PAGE

This Menu programs another set of Motion Detection criteria for each camera. When used with the Motion Detection Timers, these can be used to compensate for the low light level conditions at night. These settings can also be used as "after hours" or weekend settings.

Notes: Units without Motion Detection will not have this Menu.

1) The Night Motion Zones are identical to those set in the Motion Detection Zones: they can not be programmed separately.
2) Note the Camera number at the top of the screen. Make sure the camera being programmed is the desired camera. To change the camera being programmed, position the cursor in the left hand column, and press the desired Camera button.

The separate Sensitivity and Trigger Levels in the Night Motion Settings are programmed as in the Motion Detection Menu (see above).

Programming the Alarm Timers
THE ALARM TIMERS PAGE

This Menu programs each camera for Motion Detection, Hard Contact Inputs, and Night Motion on and off times.

Camera **01** Settings

			Start	Stop
1	**D**	**D**	12:00AM	11:59PM
2	**D**	**OFF**	12:00AM	11:59PM
3	**D**	**OFF**	12:00AM	11:59PM

Main Menu

Notes:

1) Each Camera can have up to three timer settings.
2) In units without Motion Detection, this menu affects only Hard Contact Alarms.

Note the Camera number at the top of the screen. Make sure the camera being programmed is the desired camera. To change the camera being programmed, position the cursor in the left hand column, and press the desired **Camera button.**

Each Timer is divided into 5 columns: Timer number; Day/Night; OFF/Days: Start; and Stop.

1) Timer number: Each of the timers is numbered 1 to 3.
2) Day / Night   This setting determines whether the Motion Detection operates according to its Day or Night configuration.
3) OFF / Days   If OFF is selected, the timers will be inactive. The following selections are available for the days of the week the timer will be active.
   D-every day (daily, Sun-Mon)
   M-F Weekdays (Mon-Fri)
   S-S-Saturday and Sunday
   SU, M, TU, W, TH, FR, SA
4) Start time: Determines the timer Start Time.
5) Stop time: Determines the timer Stop Time.

Setting the Alarm Timers

1) Use the **Up** and **Down Arrow buttons** to select the desired timer.
2) Use the **Left** and **Right buttons** to move the cursor from column to column.
3) Use the **Up** and **Down Arrow buttons** to select D (day) or N (night). This sets whether the following timer programming applies to Motion Detection Settings or to Night Motion Settings.
4) Move the cursor to the right. Use the **Up** and **Down Arrow buttons** to select the Day(s) for the timer to be active.

5) Move the cursor to the right again. Use the **Up** and **Down Arrow buttons** to select the Start Time.

6) Move the cursor to the right again. Use the **Up** and **Down Arrow buttons** to select the Stop Time.

7) Move the cursor to the far left hand column. Be careful not to change any of the settings made earlier.

8) If desired, set the other timers, as above.

Notes:

1) The default for all cameras is:

      Timer 1: D D 12AM 1:59PM

      Timers 2 and 3 OFF

2) Timers that conflict or overlap will default to the earliest Start Time and the Latest Stop Time of all times programmed: timers set ON will override timers set OFF.

Programming the Record Mode
THE RECORD MODE MENU

This menu programs the recording rate of the frame switcher, for both normal recording and alarm recording. The duration of the alarm recording time for each camera is determined by that camera's Alarm Duration setting in the Camera Settings Menu.

Rate Type	**HOUR**, FIELD
Normal	**24 HR** (0-65,334HR)
	7 FLD (0-65,344FLD)
Alarm	**2 HR** (NTC)
	3 HR (PAL)
	0 FLD (no delays)
VCR Type	**COMP**, S-VHS
Main Menu	

Notes:

1) If connected, the VCR Gate Pulse will control the unit's VCR output rates. **If connected, it will override any Frame Rate settings.**

2) The options in this Menu are limited by the format, NTSC or PAL. Only those options compatible with the current format will be shown.

3) If the Alarm Rate differs from the Normal Rate, the VCR's Alarm In must be connected to the unit's Alarm Out.

4) Be sure that the VCR's Alarm Rate and Duration matches the unit's Alarm Rate and Duration.

<u>Setting the Type</u>

This function permits the system to set the VCR record rate by either HOUR or, if known, by the FIELD DELAY made available by the VCR manufacturer.

Selecting HOUR or FIELD format affects all the options in this Menu. The HOUR format allows for all settings to be made in one hour increments. The FIELD format allows for all settings to be made in field delay increments. If in doubt, consult your VCR manual to determine the correct format.

Setting the Normal Record Rate

Select the VCR record rate for normal daily record operation.

1) Move the cursor to NORMAL, then into the right hand column.
2) Use the **Up** and **Down Arrow buttons** to select the desired Normal Record Rate; 0-65,534HR or 0-65,535FLD.
3) When the desired setting is reached, move the cursor back into the left hand column.

Setting the Alarm Record Rate

Select the VCR record rate that matches the VCR programmed rate for recording during an alarm.

1) Move the cursor to ALARM, then into the right hand column
2) Use the **Up** and **Down Arrow buttons** to select the desired Alarm Record Rate; 0-65,534HR or 0-65,535FLD.
3) When the desired setting is reached, move the cursor back into the left hand column

Setting the VCR Type

Select whether the VCR is connected with standard coax BNC cables (COMPOSITE) or by special cables to the S-VHS connectors. This setting tells the unit which source to read from on VCR playback.

1) Move the cursor to VCR Type, then into the right hand column
2) Use the **Up** and **Down Arrow buttons** to make the appropriate selection, COMP or S-VIDEO.
3) Return the cursor to the left hand column.
4) Select Main Menu to exit.

Note: Do not select S-VHS as a programming option on monochrome units.

Programming Timers for Sequences
THE SEQUENCE TIMER MENU

This menu programs the timers to assign sequences to particular monitors. If enabled, the sequence will over ride front panel operation. If OFF is selected for either TIMER or DAY timer functions will be suspended.

Timer **01** (2,3,4) **OFF** (ON)

Day	**OFF** M-F, S-S, DAILY, M, T, W, TH, F, SA, SU)
On Time	**00:00** (AM, PM)
Off Time	**00:00** (AM, PM)
Monitor	**A** (B) or (B, C, D, E, F)
Sequence	**1** (2, 3, 4)
Main Menu	

Notes:

> **1)** An alarm will over ride timer functions.
> **2)** The defaults are:
>> TIMER - OFF
>> DAY - MON
>> ON and OFF TIMES - 12AM NTSC (00:00, PAL)
>> MONITOR - A
>> SEQUENCE - 1.
> **3)** Unit will run in Normal Mode if no timer is active.

Programming the Frame Switcher Timer
THE FRAME SWITCHER TIMER MENU

This Menu programs timed changes in the rate of the Frame Switcher. This enables the unit to match any changes that may occur when using a time lapse recorder with programmed timers for changing the recorders frame rate. Before programming this Menu, review the settings for the frame rate timer of the time lapse recorder. Make sure that the timers match in both time and rate.

Timer **01**	**OFF**, ON
Days	**OFF**, SU, M, TU, W, TH, FR, SA, D, M-F, S-S
On Time	12:00AM
Off Time	11:59PM
Rate	**24HR** (0-65,334HR)
	11FLD (0-65,334FLD)
Main Menu	

Programming the Frame Switcher Timer

> **1)** Timer number: Set the desired Timer number, 1-4
> **2)** OFF / Days: If OFF is selected, the timer will be inactive. The following selections are available for the days of the week the timer will be active.
>> D - every day (daily, Sun - Mon)
>> M-F - Weekdays (Mon - Fri)
>> S-S - Saturday and Sunday
>> M, T, W, TH, F, SA, SU
>
> **3)** On Time: Set the desired time for the Timer to start.
> **4)** Off Time: Set the desired time for the Timer to stop.
> **5)** Rate: Set the desired Rate for the frame switcher output for the duration of the timer.

Setting the Print Options
LOG / PRINTER MENU

This Menu Programs the time and type of alarm that will be sent to the printer.

24 Hour	**NO** (YES)
Print Pix	**NO** (YES)
Time	**12:00AM**
Printer Type	**TEXT** PICTURE
Main Menu	

Notes:

1) A **PCL-5 compatible printer** must be correctly connected to allow pictures to be printed; however, the Event Log will print on virtually any standard printer, including dot-matrix and inkjet types.
2) While the unit is printing an image, the Digital Display will be black for approximately 90 seconds.
3) If "24 Hour" is selected, the Event Log will print automatically every 24 hours, at the time set in "Time".
4) Select TEXT if printer is not PCL-5 compatible. Select PICTURE if printer is PCL-5 compatible.

....

Appendix I

Pin Outs:

The following is a listing of all I/O by connector by pin number.

DB9   RS-232 Serial Port Female

Pin   1   Gnd for +12 volt power supply
     2   RXD
     3   TXD
     4   DTR
     5   Gnd
     6   N/C
     7   RTS
     8   N/C
     9   +12 Volt power supply for external controller

DB9 Data Port Female (PTZ Port / RS-422)

Pin   1   Trans_A
     2   Trans_B
     3   Rec_A
     4   Rec_B
     5-9   N/C

DB25 Printer Port Connector   Female (Standard Centronics Printer)

Pin   1   STB
     2 - 9 D0 - D7
     10   ACK
     11   Busy
     12   PE
     13   Select
     14-17 N/C
     18-25 Gnd

DB25   Alarm I/O DB25 Female

Pin   1   Frame Gate Pulse (Camera Switcher Pulse)
      2   Alarm Out A
      3   Trans_A
      4   Trasn_B
      5   Alarm 1
      6   Alarm 3
      7   Alarm 5
      8   Alarm 6
      9   Alarm 8
      10   Alarm 10
      11   Alarm 12
      12   Alarm 14
      13   Alarm 16

      14   Gnd
      15   Alarm Out B
      16   Rec_A
      17   Rec_B
      18   Alarm 2
      19   Alarm 4
      20   Alarm 7
      21   Alarm 9
      22   Alarm 11
      23   Alarm 13
      24   Alarm 15
      25   Gnd
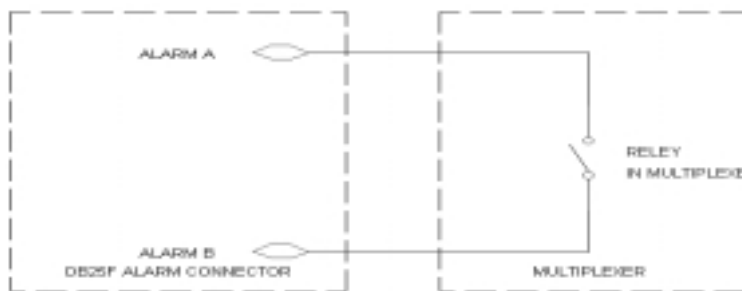
Appendix II

Listing of all ASCII commands for controlling the system for Version 3.0 or higher software. The Unit can be controlled via RS-232 using the following command set. The following communications setups are required: 9600, 1 start bit, 8 data bits, 1 stop bit and no parity.

(**Note**: The equal symbol = must be entered)

=C01 to =C16	Camera 1 to Camera 16
=MA	Monitor A
=MB	Monitor B
=VL	VCR / Live (toggle)
=ZM	Zoom
=X1	X1
=X4	X4
=X9	X9
=X16	X16
=UA	Up Arrow
=DA	Down Arrow
=LA	Left Arrow
=RA	Right Arrow

The following commands represent multiple key strokes:

=PL	Print Log
=DL	Display Log
=FL	Flush Log
=PSEQ	Program Sequence
=PSAL	Program Salvo

Version 3.31 or greater Commands
Setups 1200, 1 start bit, 8 data bits and 1 stop bit, no parity
XXX=Unit ID Code

Camera Button	'=',X,X,X,'0','0',Y,Y,^M
MonA	'=',X,X,X,'0','0','2','0',^M
MonB	'=',X,X,X,'0','0','2','1',^M
Program	'=',X,X,X,'0','0','4','0',^M
Zoom	'=',X,X,X,'0','0','4','1',^M
VCR/Live	'=',X,X,X,'0','0','4','2',^M
Full	'=',X,X,X,'0','0','4','3',^M
4X	'=',X,X,X,'0','0','4','4',^M
9X	'=',X,X,X,'0','0','4','5',^M
16X	'=',X,X,X,'0','0','4','6',^M
Up	'=',X,X,X,'0','0','6','0',^M
Down	'=',X,X,X,'0','0','6','1',^M
Left	'=',X,X,X,'0','0','6','2',^M
Right	'=',X,X,X,'0','0','6','3',^M
Setup	'=',X,X,X,'0','0','F','8',^M

```
PGM+MonB          '=',X,X,X,'0','0','F','9',^M
PGM+MonA          '=',X,X,X,'0','0','F','A',^M
Flush Log         '=',X,X,X,'0','0','F','B',^M
Display Log       '=',X,X,X,'0','0','F','C',^M
Print Log         '=',X,X,X,'0','0','F','D',^M
Print Picture     '=',X,X,X,'0','0','F','5',^M
X  = Unit ID Code
^M = Carrier Return
YY = Camera 01-16 (01,02,03,04,05,06,07,08,09,0A,0B,0C,0D,0E,0F,10)
```

All data in quotes is sent as an ASCII character

Appendix III

Remote Keyboard Connections

Multiplexer DB-9M   **Remote Keyboard DB-9F**

```
1 ----------------------------------------------------- 1
2 ----------------------------------------------------- 2
3 ----------------------------------------------------- 3
5 ----------------------------------------------------- 5
9 ----------------------------------------------------- 9
```

Note: Pin 1 and 9 not required if you supply a 12VDC supply to the remote keyboard locally at the keyboard location. You can use a pin to pin standard DB9 extension cable for all other connections are not used.

PC Connections

Multiplexer DB-9M   **PC Computer DB-9F**

```
2 ----------------------------------------------------- 3
3 ----------------------------------------------------- 2
5 ----------------------------------------------------- 5
```

Specifications

Television Standards	Auto Detect NTSC, EIA, PAL, CCIR
Power Standards	Auto Detect 100-240 VAC 50/60Hz
Resolution (pixels x lines)	NTSC 858 X 525 Maximum
	NTSC 720 X 480 Normal Monitor Display Area
	PAL 864 X 625 Maximum
	PAL 720 X 576 Normal Monitor Display Area
Video Inputs	16: 1.0V P-P Composite Video BNC, Looping
Termination Selection	Each Channel via Dipswitch: Hi-Z or 75 ohm terminated
Video Montor Outputs	3: 1V P-P Composite Video BNC
Main Digital Monitor Display	Full Screen, 4X4, 3X3, 2X2, or 2X Zoomed
Call Monitor Displays	2: Manual, Sequenced or Homed Full Screen Image
	4 Timed Switching Sequences per day
	Mon-Sun, or Mon-Fri, and Sat-Sun
VCR Video Inputs	1: 1 V P-P Composite 75 ohms BNC
	1: SVHS Component Y/C Input
VCR Video Outputs	1: 1 V P-P Composite 75 ohms BNC
	1: SVHS Component Y/C Output
VCR Control Input	Camera Switcher or VCR Gate Pulse
Frame Rate Control	3 Timers per day for changing switching speeds
	Mon-Sun, or Mon-Fri, and Sat-Sun
Information Displays	Time, Date, 20 character Title, setup menus, alarm log,
	and alarm images
Time Date Format	Universal Format Selection 12 hr or 24 hr clock
	MM/DD/YR, DD/MM/YR or YR/MM/DD
Screen Languages	English, French and German
Wired Alarm Inputs	16: 1A @ 30V NO or NC
Wired Alarm Outputs	1: NO or NC Programmable for Wired and/or VMD
	Alarms
Alarm Indication	Audible and/or Visual
Alarm Dwell Time	Up to 60 minutes per alarm input
Video Loss Alarm	"Video Loss" display and audible alert
Alarm Images	Four, nine or sixteen may be stored at on second
	intervals, displayed or printed as multi-images
Alarm Reports	On-screen or printed:channel number, time, date, actual
	alarm images, or auto print every 24 hours
Video Motion Detection (VMD)	262,144 detection points per camera
	24H X 12V (288) Programmable zones
	3 Motion Detection Parameters, Object size, Sensitivity,
	and Tracking Time.
	3 Daily Timers per camera for On/Off times
	Mon-Sun, or Mon-Fri, and Sat-Sun
	Day / Night Timer for all cameras
Video Activity Detection (VAD)	24H X 12V (288) Programmable zones
	Sensitivity Setting per camera
Setup Programming	On-screen menus via keyboard or computer download
RS232 Serial Port	Remote Keyboard or computer download and/or control
Centronics Printer Port	Alarm Report printing, image output or computer
	downloading input

Data Port   Optional DB9 for Cash Register/ ATM Interface/PTZ
Security Lockout   Four digit access code
Operating Temperature   40 - 104 Degrees F or 5 - 40 Degrees C
Dimensions   44.5(W) X 30.5 (D) x 5.5 (H) cm
                              17.5 (W) x 12 (D) x 2.25 (H) inch
Rack Mounting   Optional brackets
Weight   6 Kg / 13.2 lbs
Color   Computer Beige Front, Gray case and chassis
Case   1.5mm MetalAnodized and Painted
Shipping Box Size   55.5 (W) x 46 (D) x 10.5 (H) cm
                              21.75 (W) x 18 (D) x 4.125 (H) inch
Shipping Gross Weight   6.5 Kg / 14.3 lbs
Options
        Remote Keyboard

LIMITED WARRANTY

REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EX-CLUSIVE REMEDY OF THE CONSUMER.

MTI SHALL HAVE NO LIABILITY OR RESPONSIBILITY TO CUSTOMER OR ANY OTHER PERSON OR ENTITY WITH RESPECT TO ANY LIABILITY, LOSS OR DAM-AGE CAUSED DIRECTLY OR INDIRECTLY BY USE OR PERFORMANCE OF THE PRODUCT OR ARISING OUT OF ANY BREACH OF THIS WARRANTY, INCLUDING, BUT NOT LIMITED TO, ANY DAMAGES RESULTING FROM INCONVENIENCE, LOSS OF TIME, DATA, PROPERTY, REVENUE, OR PROFIT OR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, EVEN IF AMERICAN VIDEO HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

MTI SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAM-AGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ON THIS PROD-UCT. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE DURATION OF THIS WAR-RANTY.

MTI warrants all products against defects in material or workmanship as follows:

For a period of **2 Years** from the date of shipment, MTI will pay all charges to repair the defective product.

Labor and Parts:

To obtain warranty services during the **2 Year** period, you must take the product, or deliver the product prepaid, to MTI. If product is delivered it must be in either its original packaging or packaging affording an equal degree of protection, to any authorized MTI facil-ity.

Parts only:

During the warranty period, any defective part will be replaced if it is taken, or deliv-ered prepaid, to MTI.

This warranty does not cover customer instruction, installation, set up adjustments, and signal reception problems.

This warranty does not cover cosmetic damage, and damage due to acts of accident, misuse, abuse of the product, including the antenna. This warranty does not cover damage due to improper operation or maintenance, connection to improper voltage supply, or at-tempted repair by anyone other than a facility authorized by MTI to service the Product. This warranty does not cover Products sold AS IS or WITH ALL FAULTS, or consumables (such as fuses or batteries).

Proof of purchase in the form of a bill of sales or receipted invoice which is evidence that the unit is within the warranty period must be presented to obtain warranty service.

This warranty is invalid if the factory applied serial number has been altered or re-moved from the Product.

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

LIMITED WARRANTY
(Terms and Conditions)

LIMITED WARRANTY For **2 Years** from the date of shipment, Seller warrants to Buyer that the Product is free from defects in material or workmanship **UNDER NORMAL USE AND SERVICE.** Equipment manufactured or supplied by others (manufacturers other than Seller) but furnished by Seller carries the same warranty to Buyer as Seller receives from the other manufacturer, NOTWITHSTANDING ANY PROVISION TO THE CONTRARY, if Buyer has specified a particular manufacturer's product which is not the brand standardly supplied by Seller, Buyer shall look only to the other manufacturer's warranty and Seller shall not warrant such item. In such event, Buyer shall obtain only the warranty which comes with such other manufacturer's product.

EXCLUSIONS.   Seller's warranty does not cover the following:

(1)   in transit damage claims, improper handling by carrier or post office (NOTE - only the consignee of the shipment can file a claim with the common Carrier);
(2)   damages caused by incorrect use, modification, carelessness, unauthorized alterations, improper storage or unauthorized service, installation or repairs;
(3)   damages caused by fire, flood, lightning, collision, acts of God or other events beyond the control of Seller;
(4)   products or parts thereof that have had serial numbers removed, altered or defaced;
(5)   products received for repair without a RMA number and a sales or delivery receipt showing the date of original purchase;
(6)   hostile operating conditions;
(7)   use of components that do not meet Seller's specifications;
(8)   damage or failure caused by or resulting from the operation of the product with incorrect voltage;
(9)   external parts such as cabinets or keypads;
(10)   periodic maintenance and adjustments resulting from normal use.
(11)   installation or repair of the equipment without proper training from the Seller

WARRANTIES EXCLUDED, **SELLER EXPRESSLY DISCLAIMS AND EXCLUDES ANY EXPRESS OR IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR A' PARTICULAR PURPOSE WHICH EXCEEDS OR IS INCONSISTENT WITH THE WAR-RANTY HEREIN EXPRESSLY SET FORTH**.

NON-WARRANTY CLAIMS.   In the event Buyer makes a warranty claim and Seller's warranty does not apply, Buyer shall reimburse Seller for all reasonable expenses incurred by Seller in diagnosing the Installation/repair problem. Seller shall not be responsible for any damages to the Product or other property due to installation or service by a party not authorized by Seller.

BUYER'S EXCLUSIVE REMEDIES.   If the Product supplied shall fail to conform to the contract or any applicable warranty, Buyer shall immediately notify Seller of such condition and afford Seller a reasonable opportunity to inspect said Product. Seller shall, at its option, either repair or replace such nonconforming Product. Seller shall not be responsible for labor

charges for removal or installation of such equipment or material or charges for transportation, handling and shipping except as provided in Seller's written service policy. No Product shall be returned without Seller's prior written consent.

SELLER SHALL NOT BE LIABLE FOR ANY SPECIAL, DIRECT INCIDENTAL OR CONSEQUENTIAL DAMAGES OF A COMMERCIAL NATURE ARISING OUT THE USE OF OR INABILITY TO USE SELLER'S PRODUCT BY REASON OF THE FACT THAT SUCH PRODUCT DOES NOT CONFORM TO THE CONTRACT OR TO ANY EXPRESS OR IMPLIED WARRANTY. SELLER'S MAXIMUM LIABILITY SHALL BE LIMITED TO THE COST OF REPAIR AND/OR REPLACEMENT OF THE PRODUCT CLAIMED TO BE DEFECTIVE OR NONCONFORMING, SUBJECT TO SELLER'S RIGHT OF REMOVAL AND RETURN OF PRODUCT.

All of the foregoing constitute Buyer's sole and exclusive remedy and Seller's sole and exclusive liability for supplying nonconforming or defective Product.

<u>**RETURNS**</u>.   Returns of standard stocking items with no restocking fee can only be made within thirty (30) days of invoice to Buyer. All such returns must be in unopened original packaging. Any other returns must have prior written consent of Seller and restocking fee of not less than fifteen percent (15%) will apply.

To locate the service or dealer nearest you, or for service assistance or resolution of a service problem, or for product information or operation, call:

<div align="center">

MTI
Multiplexer Technology Inc.
9070 Royal Monarch Ct.
Las Vegas, Nevada, 89147, USA
Tel 702 341 0333 Fax 702 341 0334
Email <u>sales@multiplexertechnology.com</u>
Website www.multiplexertechnolgoy.com

</div>