

Image Storage

Image storage devices provide a record of activity for review at a future time. Image storage devices may be analog (VCR) or digital (DVR). The choice of storage device for a project is a matter of the amount of recording time required, features required, quality required, and, most importantly, the amount of money the end user is willing to spend.

Video Cassette Recorder (VCR)

Video Cassette Recorders, VCRs as they are commonly known, are the most basic and economical image storage devices. The VCR used for security is basically a beefed up version of the home VCR we are all familiar with. VCRs convert incoming video signals into a magnetic pulse and record them onto magnetic tape housed in a plastic housing (cassette). When the tape is played back the magnetic pulses are read from the tape and converted back to a video image for viewing. Most security VCRs use ½” cassettes, referring the width of the tape itself.

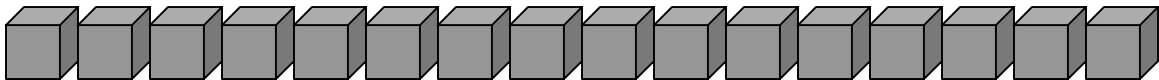
Event VCRs

Event VCRs function like normal consumer VCRs. They typically record real time (30 frames per second, for a maximum of 8 hours on a T-160 tape. Event VCRs are triggered to record by an external “event,” usually an alarm input from another device. Event recorders will record for the duration of the event, or for a pre-programmed amount of time after the event has occurred.

Time Lapse VCRs

Time lapse VCRs record snapshots at regular intervals, depending upon the time-lapse speed they are set at. The VCR captures a single image during each interval, and then does not record again until the next interval. Record times of up to 960 hours (40 days) are common. Time-lapse VCRs sometime also feature event recording features as well. VCR capability is stated in the maximum record time, and most recorders have multiple modes below the maximum record time.

Real Time Recording (30 times per second)



Time Lapse Recording (regular intervals longer than 30 times per second)



Time Lapse Interval

The amount of time between images recorded in time-lapse mode can be calculated by dividing the record time (time lapse mode) by 120. This will give you the time in between each picture in seconds.

$$\frac{\text{Recording Time (hours)}}{120} = \text{Time between image (seconds)}$$

The number of images recorded per second can be calculated by dividing 120 by the record time (time lapse mode).

$$\frac{120}{\text{Record Time (hours)}} = \text{Number of images per second}$$

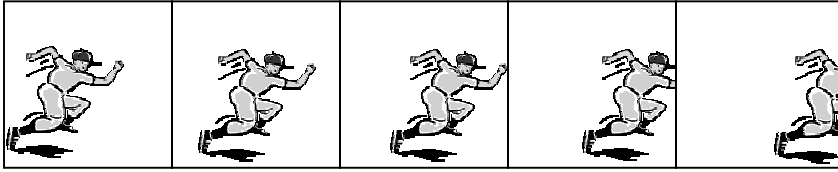
Time Lapse Recording Intervals

Time Lapse Mode	Images Per Second	Time Between Images (seconds)
12 hour	10	0.1
24 hour	5	0.2
72 hour	1.6	0.6
168 hour	0.7	1.4
240 hour	0.5	2
480 hour	0.25	4
960 hour	0.125	8

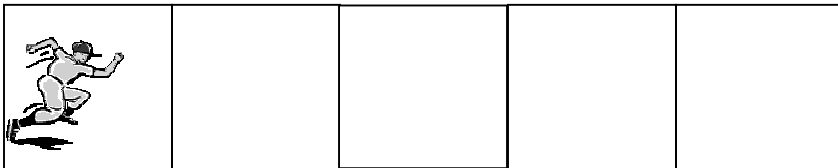
Time Lapse Modes

The time-lapse mode used will have a significant effect on the amount of information captured. A VCR running in 24 hour mode will capture 5 images per second, but a VCR running in 960 hour mode will capture *one* image every 8 seconds.

24 Hour Mode (5 images per second)



960 Hour Mode (1 image every 8 seconds)



The shortest time-lapse mode practical for the application is always preferred. The 960-hour mode may be acceptable in applications with little or no activity, multiple cameras with overlapping coverage, or very wide areas being covered that don't require much detail. Longer time-lapse modes may be a requirement in applications where a trusted person is not available to change tapes or check the system at shorter intervals. The 24-hour mode captures 40 times more information, but will require the tape to be changed or checked every day.

24-Hour "Real Time" VCRs

24 Hour "real time" VCRs record images at 2-4 times the rate of normal 24 hour VCRs. These VCRs can record up to 20 images per second. Although these units are called "real time," they are not truly recording real time. Real time is 30 images per second.

24 hour "real time" VCRs typically use T-160 tapes, and utilize special video heads to record frames of video closer together on the tape.

This document is part of a complete book entitled:
CCTV System Design & Installation

By Charles Aulner and Bryan McLane
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