

Bench Test

## The bench test 1: Time to change to digital? Probably

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The DX-TL1600 video recorder from Mitsubishi  
It's hard not to be impressed

### What our experts say ...

In just a couple of years hard disk video recording has evolved from an interesting but unrefined technology into a serious alternative to tape-based systems. But for all of the many advances and benefits disk recording has to offer, the concept can be a hard one to sell to a justifiably sceptical and often conservative surveillance industry.

Tape still has much to commend it, not least the fact that it is relatively inexpensive, generally reliable and fairly easy to use. Unfortunately picture quality of VHS based equipment has failed to keep up with improvements in camera performance. Moreover if tape recordings are to be of any use as evidence, maintenance and operating procedures must be strictly adhered to.

Hard disk recorders on the other hand, have a much higher performance capability; the quality of video recordings does not deteriorate over time or with use and modern digital compression techniques means that vast amounts of data can be stored, and searched quickly.

Admittedly hard disk recorders still have some way to go to compete on price and flexibility but if the bottom line is a higher probability of capturing useful images, with greater evidential value, then the higher cost is more than justified.

However, one of the hardest nuts to crack is the technology's relative unfamiliarity and that is something Mitsubishi has sought to address with the DX-TL1600, which combines the functions of a well-specified hard disk video recorder with a 16-channel camera multiplexer.

It doesn't look substantially different to a conventional VCR or multiplexer; along the front panel there is a bank of 16 camera selector buttons, and on the far right side is a set of conventional-looking transport controls plus a large jog/shuttle dial that wouldn't look out of place on a typical time-lapse VCR.

Behind the unthreatening looking front panel lies a very advanced piece of kit though, starting with the recording system that is capable of capturing images with up to 450 lines of resolution. The TL1600 uses M-JPEG compression in five quality grades; data is stored on a 200Gb hard disk drive array, which can be augmented by two other drives, increasing storage capacity to an impressive 400Gb. In the Basic quality mode, set to the fastest recording rate of 25 frames per second, the standard drives can store up to one weeks worth of video; if the frame rate is reduced to 5fps recording capacity jumps to over one month.

Increasing the quality setting reduces recording times accordingly and at the highest quality setting (Superior) at the fastest frame rate the duration is reduced to 40 hours.

However, the TL1600 can make the most efficient use of the space available with its built-in motion detection system. When movement is detected the unit automatically switches to alarm recording mode, preserving pre-alarm data that shows events up to the point the alarm or motion detector was activated. Detection area and sensitivity can be individually set for each of the 16 camera inputs.

The system uses a detection mask or grid of 10 x 12 targets; each one can be switched on and off and there is an adjustment for motion threshold, which can be set to ignore random activation or false alarms caused by small animals or objects.

The multiplexer provides a range of switching and display options, including sequence, single screen, split screen, quad, 3 x 3 and 4 x 4 configurations. Recordings can be copied and archived to other media – full support is provided for DVD-RAM, MO, ZIP etc while the device is still recording.

Moreover it can be connected to a network for remote surveillance and control operations. Various layers of security are built in, to prevent unauthorised use or changing of settings, and images are 'watermarked' and protected by a proprietary image alteration recognition system.

Additional features include comprehensive timer utilities, camera ident or title, a two-stage picture zoom with virtual 'pan/tilt' control, advanced high-speed search options for finding material by various criteria, including time and date, alarm and index markers. It has an Ethernet (10base T) terminal for network connection and RS-232 interface for direct PC.

On the back panel there are two banks of BNC sockets for the camera inputs and outputs and three video outputs (two composite, one Y/C), plus a range of multi-way connectors for network connection, RS 232 comms (nine-pin D-Sub), alarm input and system I/O plus a 25-way D-Sub socket for external disk drives.

The standard of construction and build quality are both very good indeed and it looks as though it should give years of reliable service. The instruction manual appears quite daunting – it is almost an inch thick – but it is multi-lingual. Even so the English part runs to over 80 densely packed pages and it is quite a taxing read.

### **Set-up & operation**

Getting the TL1600 up and running should not be a problem and it can be used on the factory defaults almost straight out of the box, following basic preliminaries such as setting the time and date. However, most users will want or need to configure the unit to their own particular installation and requirements using the menu-driven on-screen displays.

Basic settings include selecting image quality, recording mode, camera grouping and motion detection. The initial set-up menu also includes settings for actions when the drive is full, and language setting. All of this can be accomplished fairly quickly, though a thorough read-through of the substantial manual is recommended, as not all of the menu operations are necessarily very intuitive. Item selection is fast and easy, using the jog/shuttle dial.

Replaying recording is also reasonably simple, though searching footage on-the-fly is not so easy as the fast replay speed is not that fast. In other words you need to have a pretty good idea of what you are looking for and where it is to be found, as trawling through long tracts of a recording can be a slow business.

Searching for specific sequences is fairly straightforward though, using the Search Selection menu. Moreover it can display recordings in all of the standard screen formats (i.e. single, split, quad etc).

Recording quality is more or less as advertised and resolution on our sample was well in excess of 400-lines, which puts it ahead of analogue S-VHS recording systems. Image quality is further enhanced by the very low levels of picture noise, resulting in an unusually clean and sharp image that reveals plenty of fine detail.

The contrast range is about right and it copes well with rapid changes in lighting level. Colour accuracy is good though shades and subtle variations can look slightly coarse compared with analogue recordings, though in normal use this is hardly

likely to be a problem.

It is hard not to be impressed by the TL1600, which neatly fulfils the functions of an advanced 16-channel multiplexer and video recorder, with none of the hassle associated with tape.

Picture quality is noticeably better than the best analogue cassette-based tape systems, and because it is disk-based, access to any part of a recording is very significantly faster.

The TL1600 is not without its quirks though, and there are a couple of features that we would not mind seeing changed. The first is better visual indicators that show where a recording is, in relation to the disk space used or available.

The second is not confined to this product, but hard disk recorders in general: some form of audio recording would be most welcome, even if it is low quality, as it can greatly extend the usefulness of a video surveillance recording device.

#### **What the manufacturer says ...**

Meeting the security needs of a variety of businesses, the DX-TL1600E is simple to use – with familiar analogue-like controls – and offers a variety of features as standard, including Mitsubishi's trademark jog/shuttle dial.

One important feature of the new system is the motion detection function which only records when movement occurs, making for efficient use of the hard drive. Detection conditions (area, sensitivity, number of detection dots) can be customised for each camera.

The built-in 16-input multiplexer function enables full screen, four, nine or 16-division displays to be viewed, while continuous recording of each camera input is maintained regardless of which view is selected. For each camera it is possible to set the recording interval in accordance with the monitoring application. Timer recordings can be done with cameras of three presets such as day, night and midnight to meet any business hours.

An impressive 200GB high-speed hard drive is included, reducing the need for tape changing, logging and storage. Compared to conventional analogue VCR, it has the equivalent capacity to around thirty VHS 180-minute tapes (in basic mode). Using the system's additional SCSI lds, storage capacity can even be extended to 400GB. Other memory options are available on request.

The DX-TL1600E can be easily backed up while simultaneously recording and it is compatible with ZIP drives, DVD-RAM, MO drives and DDS drives.

The DX-TL1600E comes with built-in network support. This powerful function is ideal for head office monitoring of remote locations. ISDN or ADSL routers can also be used if a network is not available.

The proprietary image-alteration recognition method processes each image recorded with this unit and a password lock function prevents mis-operation or tampering. Image resolution is more than 450 lines in superior or high mode and recording time is up to 163 days, dependent on mode.