

## High-Speed Video System: Ensures Product Reliability



### Applications

*Design more 'rugged' systems  
and equipment*

*Conduct product trouble-  
shooting*

*Design shock treatments*

*Validate treatments*

*Provide quality assurance*

High-speed video recording equipment—a camera, computer-linked controls, memory board and interface software—has simplified E-A-R's data-gathering when analyzing motion and shock. The system captures high-speed digital images directly onto a computer. It helps to “see” precisely how products fail and helps to design and validate solutions.

For ease of operation, the camera can be started and stopped remotely via a hand-held switch or external signal trigger. The trigger enables controlled and intermittent events to be captured as well.

After recording the *event* being studied, the images can be viewed in forward or reverse motion, at speeds ranging from 1 frame per second to 8,000 per second, to analyze dynamic motion during the event. The Windows®-based software gives “point-and-click” functionality, and the computer-based images can be quickly, simply and accurately analyzed. Images are archived in the standard Microsoft .AVI file format, but they can be converted to multiple computer formats or even transferred to video tape, for sharing with customers.

The computer-based equipment gives E-A-R greater flexibility for analyzing the images. We can save the recorded sequence, or part of the sequence, in a computer file or on a floppy disk for later retrieval and study. We also can provide images for a customer to review, both during the problem-solving and post-solution phases.

Frequently, this recording system is used with E-A-R's Precision Drop Tester, which provides accurate, repeatable “falls” to test the effects of shock energy. (See NTC-103, Precision Drop Tester: Repeatable, Measurable Shock Events.) The combined equipment enables faster, more accurate solutions, by compressing the time between problem diagnosis, solution design and validation.



*E-A-R's high-speed video recording equipment significantly expands our capabilities to design solutions for shock and motion problems.*

## **Key Features of the High-Speed Video System**

- Storage of up to 65,536 frames.
- Recording rates of 60, 125, 500, 1000, 2000, 4000 and 8000 frames per second.
- Playback rates of single frame or 1, 2, 3, 4, 5, 10, 25, 30, 50, 60, 125, 250, 500, 1000, 2000, 4000, and 8000 frames per second, forward or reverse.
- Sensor array of 658 x 496 pixels.
- Image resolution up to 480 x 420 x 8 bit pixels per frame.
- Electronic shutter speeds of a factor of 1x to 20x of the set recording rates. Depending on the frame, speeds range from 1/60 second to 10 microseconds.
- External trigger signal generated by an optical, acoustic or electronic sensor (standard 5-volt TTL signal or up to 30-volt DC signal.)
- File format in AVI, Bitmap, JPEG, PCX and TIFF.
- A playback feature that puts reference markers on a recorded video image shown in a camera or computer file window. It can be used to measure the distance and speed of travel of a point of interest in the event sequence.
- RS-170 (NTSC or PAL compatible) output to VCR or external monitor.