

High Speed Camera **NAC E-10**

High speed camera is an excellent Engineering Analysis Tool to record phenomena happening in a moment on the film at high speed for observing and analyzing the details of the motion by replaying in slow motion.

nac E-10 can photograph up to 10000 fps (frames per second). The phenomena can be extended 625 times in time at 16 fps projection.

nac E-10 has been developed after searching the idea of "highest quality of rotating prism type of high speed camera." Herewith the ideal high speed camera has been developed.

nac E-10 has many characteristic features.

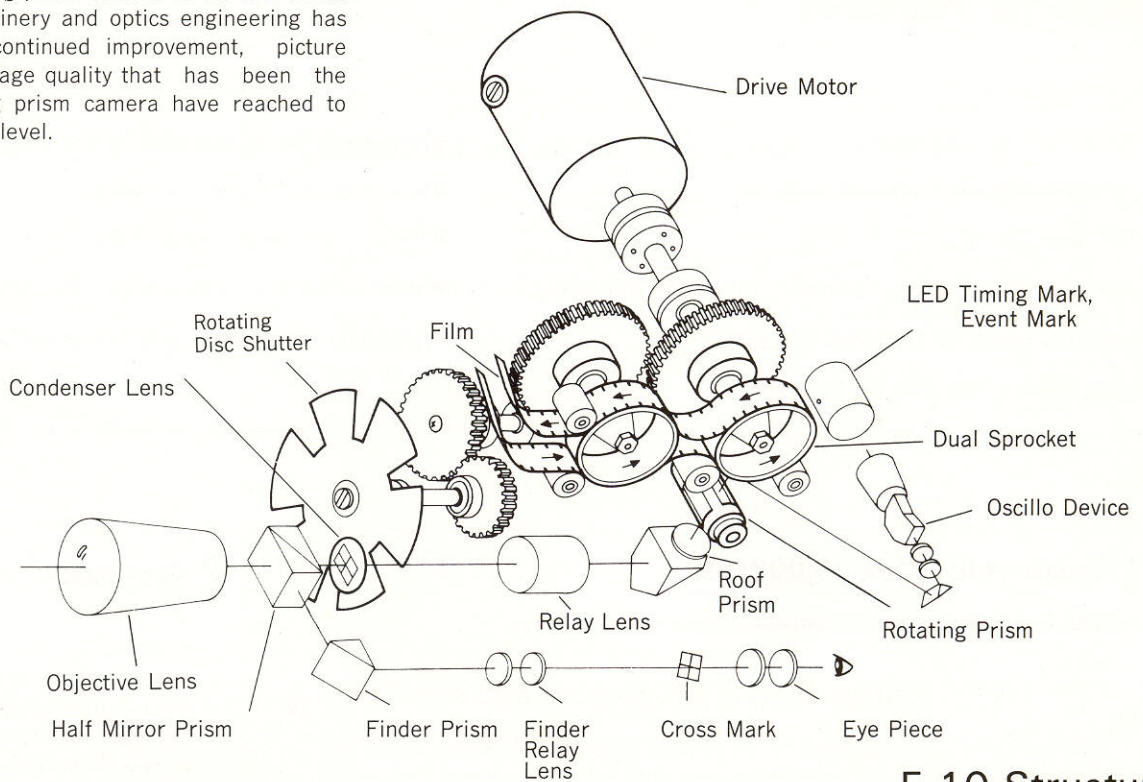
1. Excellent picture stability and sharp image assured.
 - A dual sprocket drive system virtually eliminates image "bounce" or "jump" that has been defects of rotating prism type of high speed camera. The high quality image available from **nac E-10** is compatible with that of intermittent type of high speed camera.
 - Fast relay lens and high refraction prism make the total optics number F2.5. Such a fast optics is one of most characteristic features of this high speed camera.
 - Interchangeable rotating disc shutter makes image quality improved.
2. Easy operation, wide variety photography.
 - With bright, high magnified continuous reflex viewfinder, framing and focusing is extremely easy. Continuous reflex viewing is available only with **nac E-10** among rotating prism type high speed cameras.
 - Higher frame rate is available with half and quarter height frame photography by easily interchanging rotating prism.
 - 4 sided rotating prism (full frame) 300-10,000 fps
 - 8 sided rotating prism (1/2 frame) 600-20,000 fps
 - 16 sided rotating prism (1/4 frame) 1,200-40,000 fps
 - Streak photography is available. A combination of slit and fixed prism can provide streak photography.

3. Many functions are incorporated for better analysis.
 - Optics for recording oscilloscope image simultaneously on the film is available.
 - Reference cross mark can be photographed.
 - Halfway stop of film is available (up to 3000 fps). The film footage exposed can be displayed in digital.
 - A pulse can be triggered corresponding to each frame.
 - Timing mark and event mark can be recorded. Precise timing information in 100 and 1000 Hz can be recorded on one edge of film by crystal controlled timing pulse generator. Event mark to show the phenomena occurring time can be recorded on the other edge of the film.
4. Latest electronic controller.

The electronic controller was designed with easy and correct operation. Test run switch, real time speed indicator, event mark sync lamp, and digital footage counter are laid out on the operation control panel for easy and confirmed operation.

 - Speed is regulated in the range from low speed to maximum speed.
 - Film acceleration to the frame rate set is very fast and film runs at constant speed after the speed reaches to the frame rate set.
 - Synchronization with the phenomena can be all made in digital. Pre-start that camera controls the phenomena and post-start that the phenomena controls the camera can be set in digital.
 - Real time frame rate indicator, for the first time with high speed camera in the world, can be displayed on the panel. It is the indicator of sense of relief.

nac E-10 rotating prism camera is the fine result that Japan's machinery and optics engineering has produced. With continued improvement, picture steadiness and image quality that has been the subject of rotating prism camera have reached to the world highest level.



E-10 Structure

nac E-10's excellent design

- 16mm cine film used in high speed photography is very delicate. In normal cinematography of 24 fps, the film runs at 0.66 km/h in the camera. In the high speed photography of 10,000 fps with **nac E-10**, the film runs at 275 km/h. It has been considered difficult to have stabilized image same as the normal speed cinematography.
- Without damaging the film by scratches or breakage, the speed reaches the maximum speed in 1.8 seconds from the start and the camera finishes photography about 4000 frames (30 meter length) at the stabilized speed. At such the maximum frame rate, the image quality is still assured.
- **nac E-10** high speed camera incorporates highest quality optics, high precision 4 sided rotating prism (max. 150,000 rpm), special bearing to support prism assy and important high precision dual sprocket with special teeth to ensure image stability.
- Rotating disc shutter effective for improving image quality and shutter effect rotates at 100,000 rpm. (The maximum rotation speed is "Mach 1"). Excellent high precision gear and all mechanical parts are manufactured and assembled with strict inspection.
- **nac E-10** developed with combination of compact powerful, ultra high speed motor (maximum 30,000 rpm) controlled by latest electronic technology.

