NASA TECH BRIEF

High Speed Television Camera System Processes
Photographic Film Data for Digital Computer Analysis
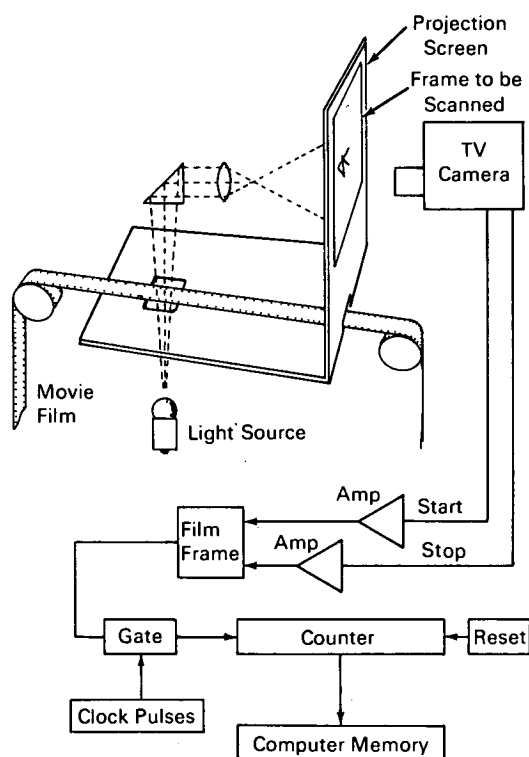
Television Camera System for Reading Photographic Film.

The problem:

A data acquisition system is needed to translate and process graphical information recorded on high speed photographic film. The system must automatically scan the film and store the graphical information with a minimal use of the computer memory.

The solution:

A previously developed television camera scanning technique could easily be applied to read the high speed movie film. It requires a small portion of the computer memory storage (400 locations for 400 scanning lines), a feature which makes available the remainder of the memory for program storage and further data processing. The previous operation time of two weeks could be reduced to a few minutes by this automatic scanning technique.

How it's done:

As the beam of the TV camera starts to scan the film frame (see figure), it senses a reference line 1, at which time a video signal is generated to start a counter. The counter continues until reference line 2 is reached; at this time the video signal stops the counter. The value of the signal level stored in the counter is proportional to the amplitude (distance) between the two reference lines. The information stored in the counter is sent to the computer storage during the time (blanking interval) the scanning beam is being returned to the beginning of the next line. The register in the counter is cleared and the scan of the next line begins. Consequently, at the end of the complete scanning of the frame, sufficient information has been stored in the computer to enable calculations of physical parameters derived from the photographic image.

In one particular application of this technique, where high speed photographic film was used to record the static and aerodynamic performance of aircraft models in a wind tunnel, it was possible to calculate the model attitude and also the displacement vector from the data of two successive frames. The new TV scanning system required only 400 words to define the attitude and displacement vector compared to 640,000 words per frame of a previous system.

Notes:
1. This technique can be used to find the areas under curves, and to determine the motion of a body travelling along various trajectories and through various media. It should be of interest to all organizations involved in the analysis of graphic data.
2. Requests for further information may be directed to:

> Technology Utilization Officer
> NASA Pasadena Office
> 4800 Oak Grove Drive
> Pasadena, California 91103
> Reference: B70-10282

Patent status:
This invention is owned by NASA, and a patent application has been filed. Royalty-free, nonexclusive licenses for its commercial use will be granted by NASA. Inquiries concerning license rights should be made to NASA, Code GP, Washington, D.C. 20546.

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