Control Techniques in Film Processing

The manuscript for this book is the result of nearly two years of concentrated effort on the part of a special subcommittee of the SMPTE Laboratory Practice Committee. Subcommittee Chairman is Walter I. Kisner whose monumental contribution includes acting as coordinator and editor of the book. Publication has been scheduled for May 1960. It will be a first-class book, in both appearance and content, a book of which the Society will be proud. Printed on first-quality coated paper, with a sewed binding and board and cloth covers, with aluminum stamping on spine and front, its "dress" is designed as an appropriate indication of the quality of its contents. The book contains 73 illustrations.

Each of the 10 chapters is written by a recognized specialist in some definite phase of film processing. The subject matter is of basic interest to everyone engaged in film processing in laboratories serving motion-picture, television and the many specialized fields such as high-speed and instrumentation photography.

Project's history and purpose: In the Foreword, E. H. Reichard, Chairman of the SMPTE Laboratory Practice Committee, discusses the history and purpose of the book and points out that it "is not intended to be a handbook of instructions; instead, it is aimed toward furnishing a firm foundation for the understanding of proper process control techniques and to provide a guide for further work and study." The Foreword also brings out the great need within the industry for this book, which may be regarded as the first authoritative work in this field and a work which will have enduring value.

Following are the chapter titles with a brief description of the contents.

Chapter 1: Introduction

It is the responsibility of the laboratory to provide day-to-day repeatability of processing and high quality end results if patronage and good will are to be maintained. Every motion-picture material handled by a laboratory deserves utmost respect if the final product is to be acceptable. A short discussion is given on the differences between processing of still films and motion-picture films. The basic tools needed to evaluate and control processing are indicated and the material to be covered in subsequent chapters is outlined.

Chapter 2: General Principles of Process Control

This chapter deals with the general philosophy and basic principles underlying effective process control. The control of any process is comprised of three phases (1) process specification, (2) process evaluation and (3) diagnosis and the removal of causes of poor operation. A division of the photographic control problem into these three phases and serious attention to providing adequate performance in each, helps to simplify and organize the work. The statistical nature of data derived in control procedures needs to be recognized and forced upon the attention of the operators by control chart techniques, thus avoiding over-control.

Chapter 3: General Aspects of Motion Picture Film Processing

This chapter serves as background material for the newcomer to the field of motion-picture processing. It outlines the various types of processes required for the different production systems and the individual phases thereof. It also emphasizes the need for process control for these individual phases, preparing the way for the more detailed information given in later chapters.

Chapter 4: Mechanical Evaluation and Control

The important factors to be considered in providing proper mechanical control of processing are discussed. The selection and maintenance of instruments for control of each of these factors is then presented. Finally, the importance of careful correlation of mechanical control data with chemical and photographic control data is stressed.

Chapter 5: Instruments for Photographic Control

A general discussion of the photographic control method is given and the importance of making picture tests in helping to establish the proper limits for sensitometric control is pointed out. The basic features of control instruments, namely, sensitometers and densitometers, are described and examples of commercially available instruments are shown. The proper maintenance of these devices is outlined; such maintenance is stressed as an essential task if the sensitometric data is to be relied upon.

Chapter 6: Control Strips and Sensitometric Curves

The selection and storage of control strips is first considered and the factors influencing the frequency of control tests are discussed. The remainder of this chapter is devoted to the graphical representation of sensitometric data in the form of the classical D-log E curve. The determination of various parameters such as gamma, speed, fog, latitude and total scale is then described in detail.

Chapter 7: Sensitometric Control of a Standardized Process

The necessity for obtaining a clear concept of the aim conditions for the process in question is considered. Suggestions are

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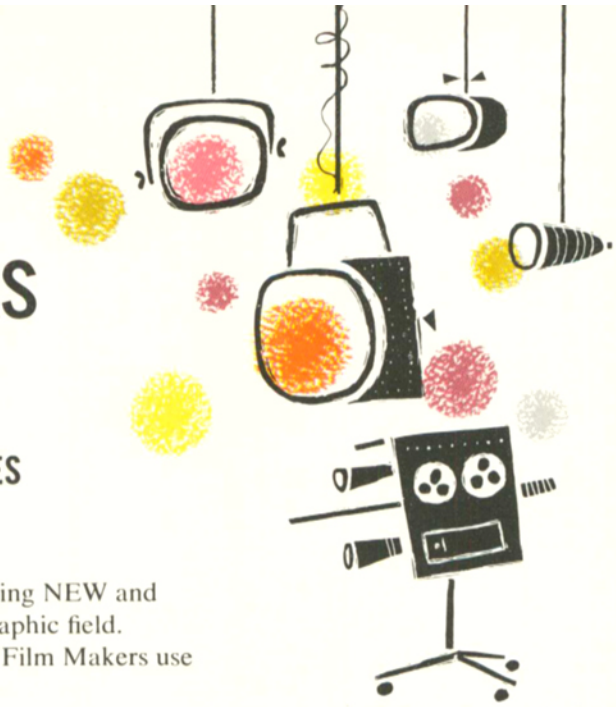

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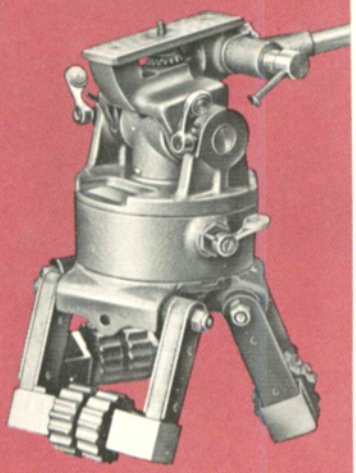

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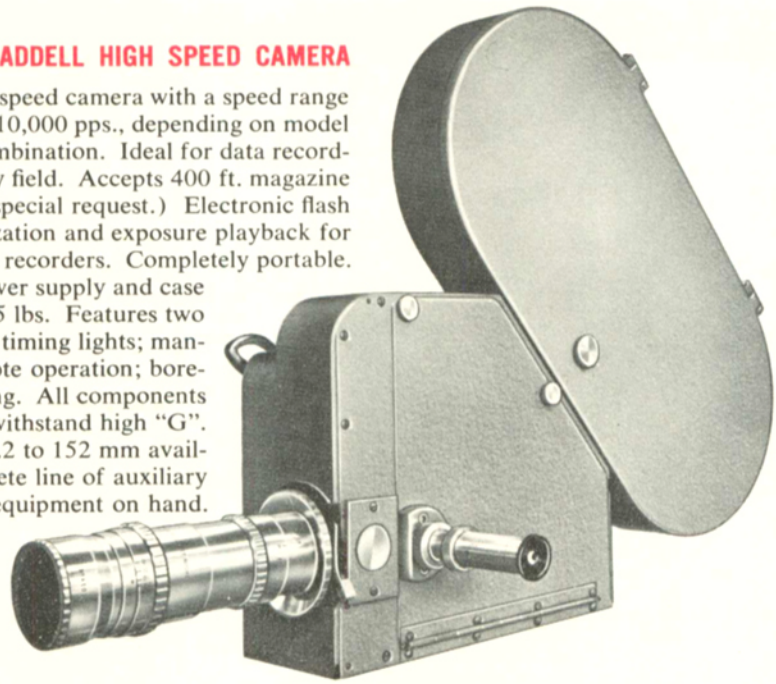

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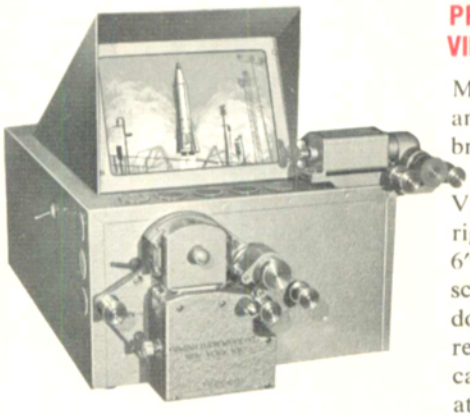

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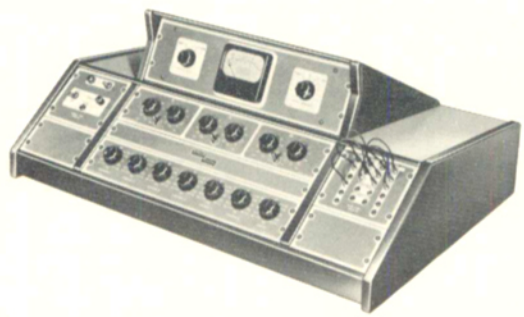

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given for establishing a standard process. To simplify the obtaining and plotting of data from the sensitometric control strips, selected densities of only certain steps of the strips are plotted on the control chart. The tolerance limits for the control chart are determined on the basis of what is considered reasonable from subjective judgments of picture and sound quality.

As a guide for establishing suitable limits, tolerance values for gamma and density for various classes of materials are stated, these limits being representative of those used by well-operated laboratories. Pertinent information is also given with respect to control of duplicating and sound recording processes. Some miscellaneous tests which make use of sensitometric techniques are also described.

Chapter 8: Chemistry of Film Processing

This chapter will be of greatest importance to those familiar with the science of chemistry, but will also be helpful as a reference for others. It covers the chemicals used in processing and the influence of the individual ingredients of a solution on the photographic result. The influence of temperature and pH of solutions is also described.

Chapter 9: Chemical Analysis and Control

The facilities and instruments needed for a chemical control laboratory are described. An extensive table listing sources of information on analytical methods is given. Information is given on recording of data, establishment of chemical control limits and practical formulation of replenishers. In the final section, some practical suggestions pertaining to the control of reversal processes are presented.

Chapter 10: Economic Considerations in Establishing a Process Control System

This brief chapter attempts to answer questions pertaining to the economic value of a process control system to a given laboratory, how much it should cost and if the cost is too high.

Conclusion

Concluding remarks stress the importance of applying the principles outlined in an effort to raise the quality level of processing throughout the industry.

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