



ACQUISITION IN DIGITAL 24P
AND 35MM FILM

**24P TECHNICAL SEMINAR
SERIES INTRODUCTION**

by Laurence J. Thorpe

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TECHNICAL SEMINAR SERIES INTRODUCTION

THE ARRIVAL OF DIGITAL 24P

24P digital HD acquisition arrived in 2000. Early reactions were mixed: it was loved by many, feared by some, and perhaps dismissed by those few who were unequivocally committed to shooting with motion picture film.

Is 24P a digital emulation of 24-frame 35mm motion picture film, or a new medium with its own "palette" of picture-making capabilities? The debate on this topic may endure. However, the very fact that "video" finally made the bold leap to a capture rate of 24 fps, at a progressively-scanned high resolution, affirms that digital image capture can be a worthy rival of 35mm motion picture film. The technical relationship between the two 24-frame media is expected to be an ongoing discourse.

The decision to embark on the development of a total 24P production and post-production system recognizes that 24-frame motion picture film has long been the premier origination medium for both prime time television production and high-end television commercial origination. The subsequent transfer process to traditional 525/625 line television systems is a technology that has been greatly refined over three decades.

TOPICAL ISSUES OF COMPARISON BETWEEN FILM AND 24P

IMAGING ATTRIBUTES – DIFFERENCES IN TERMINOLOGY

FILM

STILL FRAME PICTURE

Exposure Index
Picture Sharpness
Tonal Reproduction
Color Reproduction
Exposure Latitude

VIDEO

Sensitivity
Resolution
Contrast
Color Gamut
Dynamic Range

MOVING PICTURE

Frame Capture Rate
Shuttering (mechanical)
Granularity Index

Frame/Field Rate
Electronic
Noise

For any medium, there are many attributes that contribute to the final picture quality. Direct comparisons between media can be especially troublesome because of multiple "dimensions" of imagery.

How the film recording process and digital acquisition behave differently on each of these "dimensions" of the final captured picture quality has been a topic of numerous technical papers over many decades. These discussions and comparisons have been hindered by the quite different terminologies that have evolved separately within the video and film communities.

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It is encouraging that the experiences shooting in 24P clearly reveals a broad interest in reaching a better understanding of the performance of the digital 24P acquisition system in relation to the much more familiar 24-frame 35mm motion picture film. To foster further experiments by the creative community, and stimulate a broader technical enquiry by the engineering disciplines, we propose to examine the more prominent “dimensions” of image capture.

We will focus on those primary imaging attributes that, while now reasonably well explored in these early days of 24P, may still generate some confusion. These attributes include:

EXPOSURE INDEX - OR - CAMERA OPERATING SENSITIVITY

EXPOSURE LATITUDE - OR - OPERATING DYNAMIC RANGE

PICTURE SHARPNESS - OR - IMAGE RESOLUTION

While there are other attributes (listed previously), these three comparisons cover the most discussed aspects of digital and film acquisition.

THREE TECHNICAL SEMINARS

In the following series of Technical Seminars, we will separately review each of these areas of comparison. In doing so, we will attempt to reconcile their characteristics in a manner that will demystify the 24P digital acquisition system.

One important goal in this series of Technical Seminars will be to inform the film DP. By using film parlance, we hope to make it a little easier to understand “digital” issues. Our examinations may be technical in nature, but we will also try to bring a creative perspective to our conclusions – a perspective to which, hopefully, the film DP can relate, and indeed, subsequently contribute further enlightenment on these important topics.

At the same time, this series specifically intends to help educate cinematographers – whether their shooting experiences have been largely film or video, or indeed, both.

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