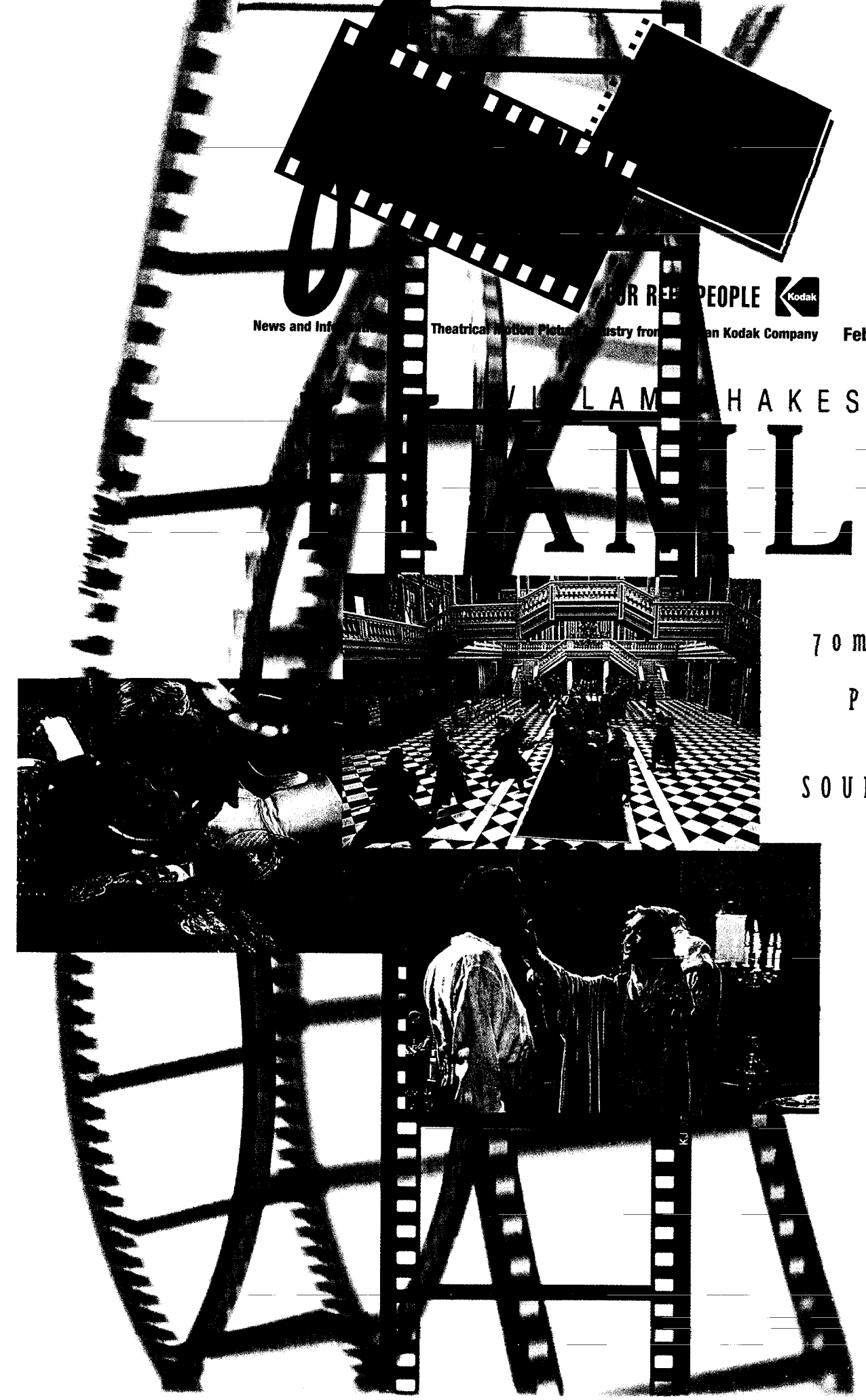
Film-Tech

The information contained in this Adobe Acrobat pdf file is provided at your own risk and good judgment.

These manuals are designed to facilitate the exchange of information related to cinema projection and film handling, with no warranties nor obligations from the authors, for qualified field service engineers.

If you are not a qualified technician, please make no adjuatments to anything you may read about in these Adobe manual downloads

www.film-tech.com



News and Inf[illegible] Theatrical [illegible]istry fro[illegible]an Kodak Company Feb. 1997

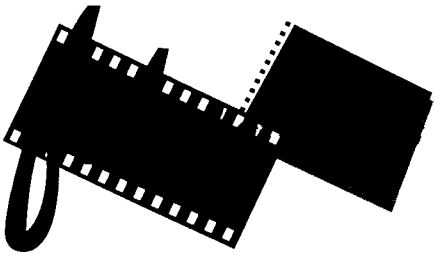
WILLIAM SHAKESPEARE'S

HAMLET

70mm - HAMLET

PROJECTION ANALYZER

SOUND - TRACKS



February 1997
II-50-42

CONTENTS

Reach Us at Our Internet Site,
www.kodak.com/go/motion

If you have any questions or comments, please write to:

Editor
Film Notes for Reel People
6700 Santa Monica Blvd.
Hollywood, CA 90038

JOHN PYTLAK
Senior Technical Associate
Motion Picture Systems Development Group

Pytlak's Practical Projection Pointers

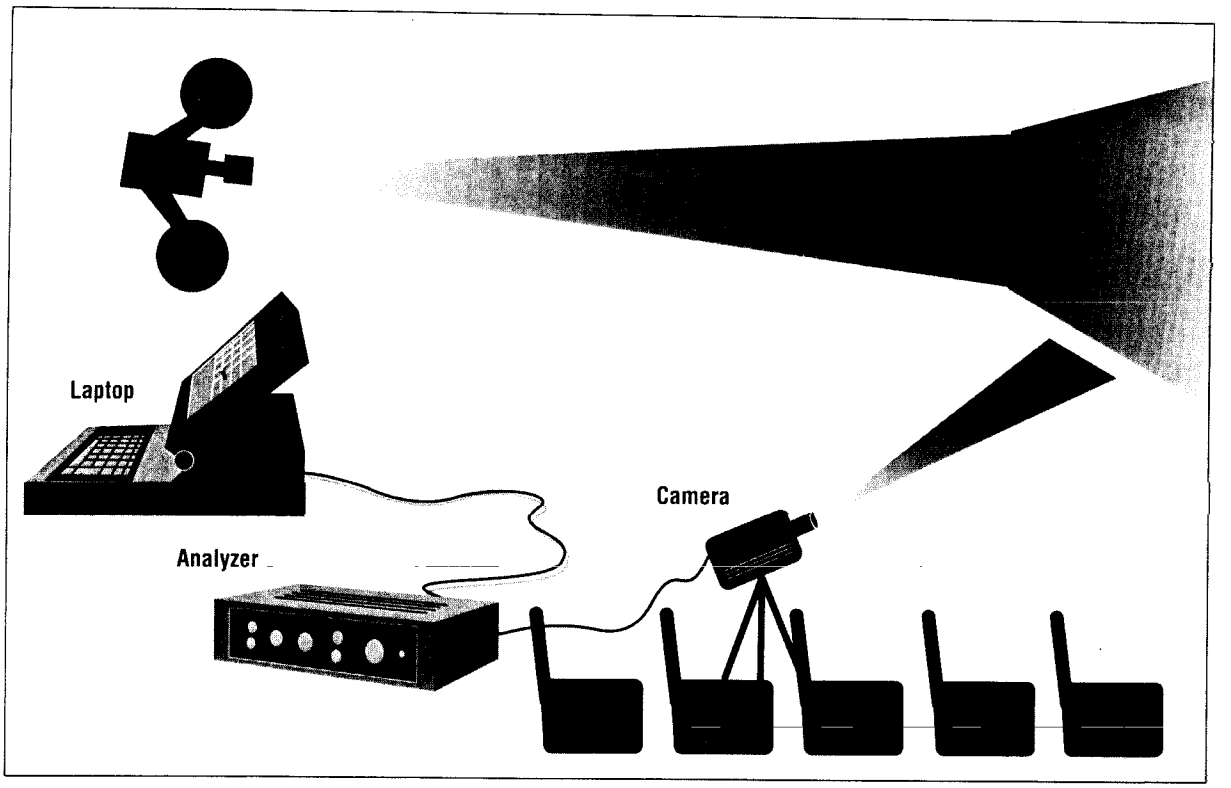
In the previous issue of this publication, we discussed the advantages of the "scope" format. Compared to the non-anamorphic 1.85: 1 aspect ratio "flat" format, the "scope" format is usually brighter, sharper, and less grainy.

The aperture plate comparison and table following show the reasons for these advantages. The film image area of the "scope" format (.825 inches wide by .690 inches high) is over I .5 times larger than the 1.85:1 "flat" format (.825 inches wide by .446 inches high). The nearly square "scope" aperture is more efficient in using the circular cone of light from the lamphouse, resulting in higher screen luminance. The elongated rectangle of the "flat" aperture uses only about 39 percent of the available light at the aperture plate, compared to about 60 percent efficiency for "scope." Typically, a projector set up to produce the SMPTE standard 16 footlamberts screen luminance for the 2.39:1 aspect ratio "scope" format will have only about 13 footlamberts for the 1.85:1 "flat" format, even though the "scope" screen image is wider. The smaller image area of the "flat" format requires significantly more magnification than "scope" to fill the same .screen height, so grain and dirt look larger onscreen and any fuzziness or vertical unsteadiness is more visible.

The introduction of CinemaScope by 20th Century Fox in 1953 remains one of the most significant engineering achievements in motion picture technology. The technical triumph of the "scope" format is its elegant simplicity. The anamorphic lens allows the use of the maximum image area on the film, and puts it on the screen. A larger image area gives pictures that are brighter, sharper, steadier, and less grainy. In contrast, the current 1.85:1 "flat" format evolved simply by cropping the available film image area and projecting it at greater magnification to produce a widescreen picture, at the expense of both light and image, and a waste of available film area on the print.

Continued on Page 10

Technology



Projection System Analyzer Introduced

At a recent meeting of the ITEA (International Theatre Equipment Association) in Los Angeles, Larry Jacobson of LJ Technologies announced progress on the Kodak project that he chairs, "Operation Bigscreen." Since the primary focus of the project is to explore options for evenly illuminating today's very large screens, a high-tech device for measuring screen light is proving to be valuable.

The Projection System Analyzer was developed by Ultra Stereo Labs at Jacobson's request. It consists of a small digital camera that is positioned in the audience area of a theatre and a computer set up in the projection booth. The single camera lens accommodates even the largest screens so a complete read-out appears on the computer

Continued on Page 8

Interview

WILLAM SHAKESPEARE'S
HAMLET
IN 70MM

A Conversation With Cinematographer ALEC THOMSON, BCS

The latest major motion picture originated in 65mm (plus 5mm for applicated sound) is Kenneth Branagh's *Hamlet*. Director of Photography Alec Thomson, BSC, is a seasoned veteran with more than fifty film credits including *Excalibur* (for which he received an Oscar nomination), *The Keep, Labyrinth, Legend, Track 29, Leviathan, The Rachel Papers, Alien 3, Cliffhanger, Demolition Man, Black Beauty,* and *The Scarlet Letter.*

Thomson reminisces about his start in the business:

Q. You began working for the famous director David Lean, didn't you?

A. Yes. I wanted to work for his production company because they made such marvelous pictures including *Oliver Twist* and *Great Expectations*. They asked what I wanted to do. I replied that I wanted to work in the camera department. They really didn't have anything for me, but said I should try again the following week. I phoned every single week for two years until they finally said "Okay, you start Monday."

Q. It's a big step from a camera department "go-fer" to the real art of cinematography. How did you progress?

Kenneth Branagh directs his film adaptation of William Shakespeare's **"Hamlet"** from Castle Rock Entertainment

A. I recall being influenced by marvelous cinematographers working at the studio, but didn't really begin thinking about composition and lighting as forms of artistic expression until I became a camera operator. I spent six years operating for Nicholas Roeg and received my first feature credit as a Director of Photography on Clive Donner's comedy *Here We Go Round the Mulberry Bush.*

When I first began lighting, I asked myself "What would Nick Roeg say or do in this situation?" Eventually, you gain self confidence and evolve. I pride myself on the fact that every film I've shot has been different. The only consistency is that I always try to complement the story.

Derek Jacobi stars as Claudius and **Julie Christie** stars as Gertrude in William Shakespeare's "**Hamlet**," directed by **Kenneth Branagh**, from Castle Rock Entertainment.

Q. Why did you and Kenneth Branagh choose to shoot a fairly introspective play in such a grand scale as 65mm?

A. Ken asked what I thought, and it was an easy question to answer. Any cinematographer would be absolutely over the moon to shoot in 65mm because it's the best you can get on film. Most of the vision for translating *Hamlet* to film came straight from Branagh's fertile imagination. Although Ken stayed with Shakespeare's complete text–making the film four hours long–he updated the time to the 19th century so it would be more visual. We didn't go for a terribly introspective approach. If you staged this film in medieval times, it would have been too dark, and difficult to sustain the mood for four hours. To that end, we used some light grays with a lot of gold trim on costumes. I also tried to lift the whole picture by keeping it bright instead of being dark and moody all the time. Ken and I concur that the audience needs to be continually stimulated, both verbally and visually–especially in a film of this length.

Kenneth Branagh (right) directs **Michael Maloney** as Laertes, and **Kate Winslet** as Ophelia in his film adaptation of William Shakespeare's "**Hamlet**" from Castle Rock Entertainment

Top - **Kenneth Branagh** (right) directs **Richard Attenborough**, who plays the English Ambassador in Willam Shakespeare's "**Hamlet**," from Castle Rock Entertainment
Bottom - **Kenneth Branagh** (left) directs **John Gielgud**, who plays Priam in William Shakespeare's "**Hamlet**," from Castle Rock Entertainment

Q. *Hamlet* has a "sweeping" feel with lots of action. Your cinematography seemed to create that. How did you accomplish that?

A. The camera was almost always moving, usually on a dolly, and occasionally on a crane so as to display the entire set to the audience The film has a bit of a swashbuckling feel, but it's not more aggressive than other dramas. John Huston once told me you shouldn't move the camera if you want people to listen. I told Ken that, but he said, "What are we going to do? You can't have a static camera when you are shooting seven pages of dialogue. The audience is going to fall asleep if they aren't interested."

Q. Were you familiar with shooting in 65mm?

A. I was the second camera operator when Nick Roeg was shooting second unit on *Lawrence of Arabia.* And years before that I was the focus puller on *The Scent of Mystery.* It was shot in Todd-AO 65. We were told by Mike Todd never

"Since the 65mm frame is more than four times greater than that of a 35mm frame, the wider format records a higher-fidelity image ....."

to get closer than the waist, because of his concern about lack of depth. But on *Hamlet*, we tracked right into huge close-ups of heads. We've got inserts of mouths and eyes. We took a lot of chances and they paid off. There is nothing you can't do with Kodak's faster films and the better glass in Panavision's new lenses.

Q. What qualities of 65mm influenced your decision to use it rather than 35mm?

A. Since the 65mm frame is more than four times greater than that of a 35mm frame, the wider format records a higher-fidelity image with much more clarity and definition. That demands crisp depth of field because the slightest softness is evident to the audience and it seems unnatural when the film is projected. With the 65mm camera lenses, I knew that my stop had to be at least T5.6 or T6.3. You are fighting for depth. I also anticipated that, because we were filming such a large area, strobing could become a concern. We shot some tests and decided that panning should be restricted to times when the camera was following someone. The strobing is still evident, but it's not as apparent because the audience is watching the person the camera is panning.

Q. There was a wide variety of shots in *Hamlet*, from panoramic vistas to intense close-ups. Did you use a single camera?

A. No, Ken wanted the extra coverage of two cameras. The specific coverage depended on the nature of the scene. If it was a ceremonial shot or a sword fight, the camera caught wide-angle views from different perspectives. On those rare occasions where he wanted static shots, the cameras were side by side shooting close-ups.

"Ken was very keen on keeping the camera running when the actors get into the dialogue and the rhythms of Shakespeare".

Claudius (**Derek Jacobi**, left) and Gertude (**Julie Christie**, right) are wed as Hamlet (**Kenneth Branagh**, center) looks on in William Shakespeare's classic, "**Hamlet**" directed by **Branagh**, from Castle Rock Entertainment

Ken was very keen on keeping the camera running when the actors get into the dialogue and the rhythms of Shakespeare. By starting the A-camera before the other one, we were able to film full scenes.

Q. Did you utilize lighting to create atmosphere?

A. Actually, not much. We rigged the lights so we could concentrate on shooting and be free to do so from any direction. We didn't spend much time lighting. It was Ken's vision and his spirit that made this film what it is. The image quality is so vivid you feel as if you can walk right into the screen.

Projection System Analyzer
Continued From Page 3

PROJECTION SYSTEM ANALYZER REPORT

Screen Luminance Readings – By zone, in footlamberts

13.0	14.0	15.0	16.0	16.0	15.5	15.5	14.5	13.5
13.0	14.0	15.0	16.0	16.0	15.5	15.0	14.5	13.5
13.0	14.0	15.5	16.0	16.5	16.0	15.0	14.0	13.5
13.5	14.5	16.0	17.5	17.5	17.0	16.0	15.0	13.5
13.5	15.0	16.5	17.5	17.5	17.0	16.5	15.0	14.0

A Sample Of A Screen Diagnosis Using The Projection System Analyzer - This Is Torus® Screen

screen. A standard laptop computer is used to issue commands to the analyzer and to graphically display the results of the measurements.

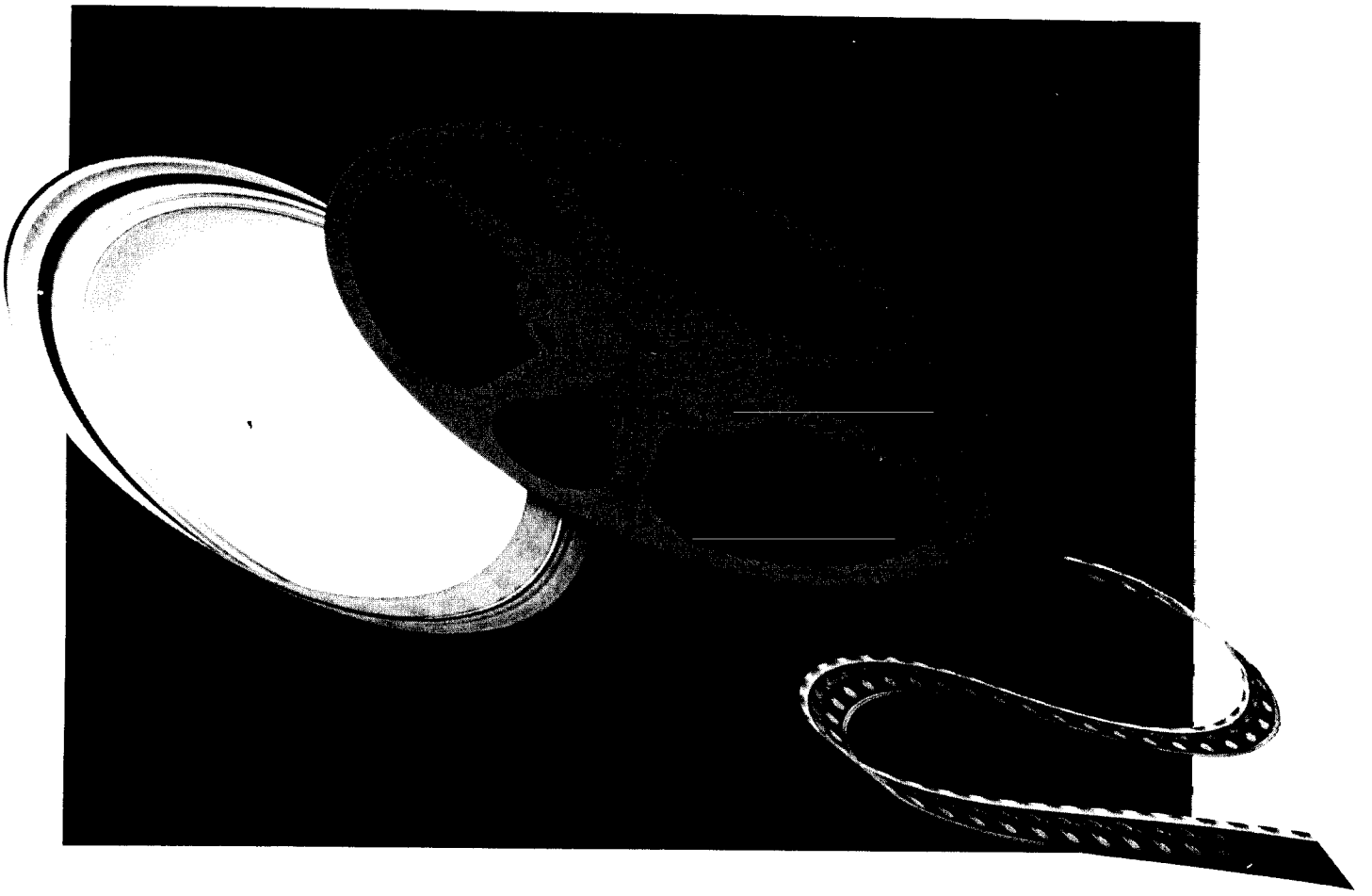
The most common useage of the device is measuring the pattern of screen luminance (brightness). The laptop screen displays a map of the screen and shows the luminance values in shades of gray as well as numerically in foot lamberts. This is particularly helpful during re-alignment of the lamphouse after changing a xenon bulb.

The screen luminance pattern is shown in the projection booth in a manner that makes lamphouse adjustment quick and relatively easy. It is no longer necessary to use a traditional light meter or rely on a technician's "best guess" for proper alignment. In the example of a screen report shown below, for instance, a "hot spot" in the lower center screen area can be readily adjusted while the operator sees the results of his efforts on the laptop.

The Projection System Analyzer also measures jump and weave, contrast ratio and flicker. All test results and pertinent data concerning the projection system can be saved and printed out for future reference. This documentation capability is important for quality control and performance comparison.

For further information about the analyzer or "Operation Bigscreen," please contact Roger Hibbard at Ultra Stereo, (818) 609-7405, or Larry Jacobson at LJ Technologies, (913) 789-8111.

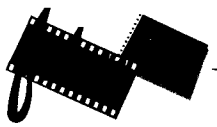
Extended Reel Update



Look for the long-awaited ELR's on the new 7,000-foot reels and new shipping cases to be "coming soon to a theatre near you!" Warner Brothers has just announced two spring releases to be delivered in the new configuration.

The March 21 release of "**Selena**" will be released in 100 West Coast theatres on the new ELR's. The company's April 11 "**Murder at 1600**" will be in wide release on the new reels.

This important change has been eagerly anticipated by exhibitors and film handlers. We salute Warner Brothers in being first into the marketplace with a shipping technology that will move our industry into the 21st century. It is long overdue!



PERHAPS A NEW FORMAT?

Imagine using the current "scope" image area, but with an anamorphic lens having less "squeeze" than the 2X factor used for the 2.39:1 aspect ratio. For instance, a 1.5X anamorphic lens would produce a 1.79:1 aspect ratio onscreen, almost an exact match to the 16:9 (1.78:1) proposed format for high-definition television. To retain the current 1.85:1 aspect ratio, a 1.55X "squeeze" would work. If the industry adopted a new "universal" aspect ratio of 2:1, a 1.67X anamorphic lens would be the choice.

Considering using a 1.5X anamorphic lens that produces a 1.79:1 aspect ratio, the only modification to the projector would be the new 1.5X anamorphic lens. The current "scope" aperture would be used for both 2.39: 1 and this new format. The standard 4-perforation pulldown would be retained, with no mechanical modifications necessary to the projector. For a 1.79:1 aspect ratio, the screen masking would be pulled in slightly from the current 1.85:1 width. No change in a existing analog or digital sound formatt should be nessary.

This proposed format would be much more efficient in putting light on the screen. Today, a projector set to produce 16 footlamberts luminance for the "scope" format has only about 13 footlamberts in "flat" because of light wasted by the shorter aperture height. With a 1.5X anamorphic lens, the same projector and lamp will give about 21 footlamberts because the larger aperture area more efficiently uses the circular cone of light from the lamphouse. The larger film image area of the new "scope" format requires much less magnification then 1.85:1 "flat," greatly improving sharpness, grain, and vertical steadiness. Because the energy of the light source is spread over a larger area of film, more light can be put onscreen with less heat on the film. This improves focus stability and reduces the possibility of heat damage. This is advantageous today because the desire to have larger screens in auditoriums is often accompanied by higher-wattage xenon bulbs.

The general dimensions of this suggested format were demonstrated in 1984 by Glenn Berggren under the auspices of the MPAA and the Intersociety. At the time, most viewers agreed that the format offered significantly sharper images, less grain, greater depth of focus, and improved light efficiency. Factoring in the numerous technological advances that have taken place in the last thirteen years (i.e.: finer-grain, higher resolution, "faster" Kodak film stock;

Comparison of "Scope" and "Flat" Apertures

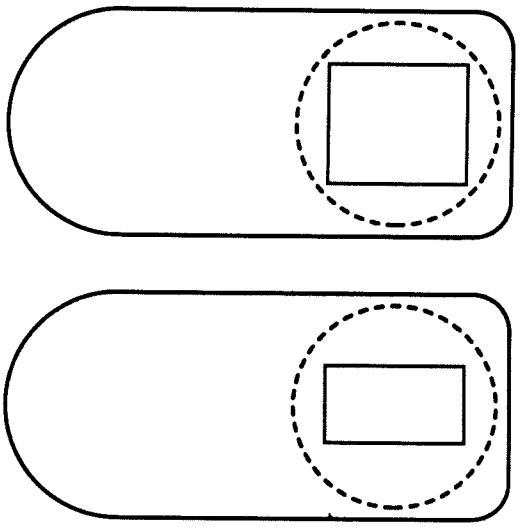
"Scope" Aperture:

Height = 0.690 inches
Width = 0.825 inches
Area = 0.569 square inches
Light Efficiency = 59.9 percent

"Flat" Aperture (1.85:1):

Height = 0.446 inches
Width = 0.825 inches
Area = 0.368 square inches
Light Efficiency = 38.7 percent

Apertures shown with a 0.110-inch diameter circle of light from lamphouse superimposed.



larger screens; more even light distribution; and better contrast ratios), the improvement onscreen today would be even more dramatic.

To optimize quality, this new format would require designing and building a new family of anamorphic camera lenses, including zoom and "prime" lenses of various focal lengths. The design is fairly straightforward (actually somewhat simpler than the 2X "squeeze" anamorphics). Possibly, the "squeeze" could be done digitally (as many special effects are today), but at additional cost.

The new format would necessitate theatres to be equipped with new anamorphic lenses, each costing approximately $3000. Although the major lens manufacturers support the concept, they need a commitment from production, distribution,and exhibition before investing in lens development. A "wait-and-see" attitude has prevailed at all levels. But the trend toward screens exceeding 30 feet in height and 60 feet in width mandates the exploration of new equipment. Adequately illuminating huge screens with aggravating focus flutter or causing heat damage to the film presents real challenges.

Kodak's "Operation Bigscreen" is poised to analyze a new format. Other groups are exploring format options as well. The National Association of Theatre Owners (NATO) has established a Blue Ribbon Technical Committee to "monitor where the industry is headed...and determine what is best so that no one gets blind-sided." Because exhibitors and audience alike want a high-quality film image, it is incumbent upon all of us to work together to achieve this.

I am most interested in commencing a dialogue about adoption of a new format. We have the need, we have the technology, and the opportunity to increase screen brightness by a minimum of 30 percent should be of great interest to all of us. Let me know your opinion. My E-mail address is **jppytlak@kodak.com.**

Comparison of Current and Possible Future 35mm Projection Formats

	Current Formats		Possible Future Formats		
Format	**1.85:1 sph**	**2.39:1 ana**	**2.00:1 ana**	**1.85:1 ana**	**1.79:1 ana**
Comments	"Flat"	"Scope"	ASC 2:1	Match "flat"	Nominal 1.5X
Film Image Height (in.)	0.446	0.69	0.69	0.69	0.69
Film Image Width (in.)	0.825	0.825	0.825	0.825	0.825
Film Image Area (sq.in.)	0.368	0.569	0.569	0.569	0.569
Lens Horizontal Squeeze	**1.00x**	**2.00x**	1.67X ~~1.66x~~	**1.55x**	**1.50x**
Lens Focal Length (mm)	48.5	75	75	75	75
Screen Height (ft.)	20	20	20	20	20
Screen Width (ft.)	37	47.8	40 ~~37~~	37	35.9
Screen Area (sq.ft.)	740	956	800 ~~740~~	740.	717
Magnification (height)	538	348	348	348	348
Magnification (width)	538	695	582 ~~538~~	538	522
Magnification (area)	**289444**	**241860**	**202536**	**187224**	**181656**
Light Efficiency (%)	38.7	59.9	59.9	59.9	59.9
Screen Luminance (ft.)	**13.4**	**16**	**19.1**	**20.7**	**21.3**

Assumptions:
Format is aspect ratio, sph=Spherical Lens, ana=Anamorphic Lens
Screen height of 20 feet is assumed for all formats in this comparison
Lens focal length example assumes projection distance (lens to screen) of 85 feet
Magnification (area) correlates most closely with image structure (sharpness and graininess)
Light efficiency is percentage of light used from a uniformly illuminated 1.10 inch diameter circle of light
Screen luminance base case is 16 ft. for 2.39:1 anamorphic format

New Developments In Analog Soundtracks

As discussed in the last issue of *Film Notes for Reel People*, our industry is moving toward the adoption of silverless dye-track sound-tracks. In recent years, environmental concerns have arisen regarding silver-bearing products. Toward addressing this concern, manufacturers and laboratories are calling for a projection conversion. When the majority of projectors in theatres are converted to read a silverless track, sound-tracks will be known as *cyan dye-tracks.*

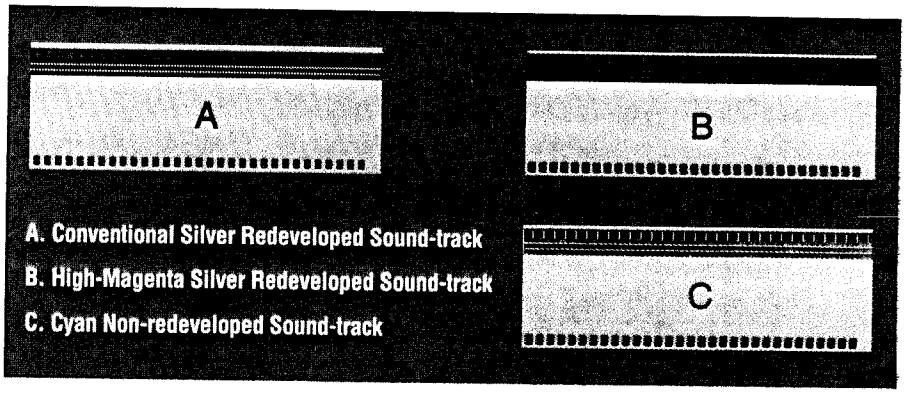
The new cyan tracks will be read in the projector by red light emitting diodes (LED's)—or "red readers" which will replace the existing incandescent exciter lamps. The advantages of LED soundheads with current silver dye-tracks include: substantially longer life (15,000 hours, contrasted with 3,000 hours for exciter lamps); increased stereo separation; improved frequency response at high signal levels and a more uniform illumination.

We estimate that there are approximately 3,000 red readers in theatres today. All new projectors manufactured by Cinemeccanica, Christie, and Kinoton are available with them. The conversion is moving quickly. Retrofits for Cinemeccanica, Christie, Century. Simplex, Ballantyne, Bauer, RCA, Tokewa, Denko, Kinoton. and Strong are also available. Retrofit manufacturers include Dolby, Ultra Stereo, Kelmar, and Component Engineering.

Red readers make the use of silverless non-redeveloped sound-tracks possible, but even though a cyan track may be *playable* with a conventional exciter lamp, the quality will be inferior to current expectations. Consequently. wide introduction of cyan dye-tracks must wait until the majority of theatres have converted to red LED readers.

Meanwhile, it has been determined that a small change with *conventional sliver* redeveloped sound-tracks can provide consistent low distortion with both conventional exciter lamps and red LED readers. The change involves a slightly different sound negative exposure and a different color balance on the release print sound-track prior to redevelopment. This interim sound-track is known as a *high-magenta silver and dye sound-track.* It is anticipated that feature films using this track will be in release within the next several months.

Theatres are encouraged to implement this conversion to red readers in their new construction, as well as retrofitting their existing projectors. Cyan dye-tracks will require efficient noise reduction (i.e., Dolby SR) to achieve optimum quality, so upgrading the noise reduction now is a good idea. Silverless sound-tracks are in the best interests of all elements of the production, lab. and exhibition communities as well as the environment.



EASTMAN KODAK COMPANY
6700 Santa Monica Blvd.
Hollywood, California 90038

ADDRESS CORRECTION REQUESTED

Publication No. H-50-42 • Printed in the U.S.A. Feb./97

BULK RATE
U.S. POSTAGE
PAID
PERMIT 368
SANTA ANA, CA