Film-Tech

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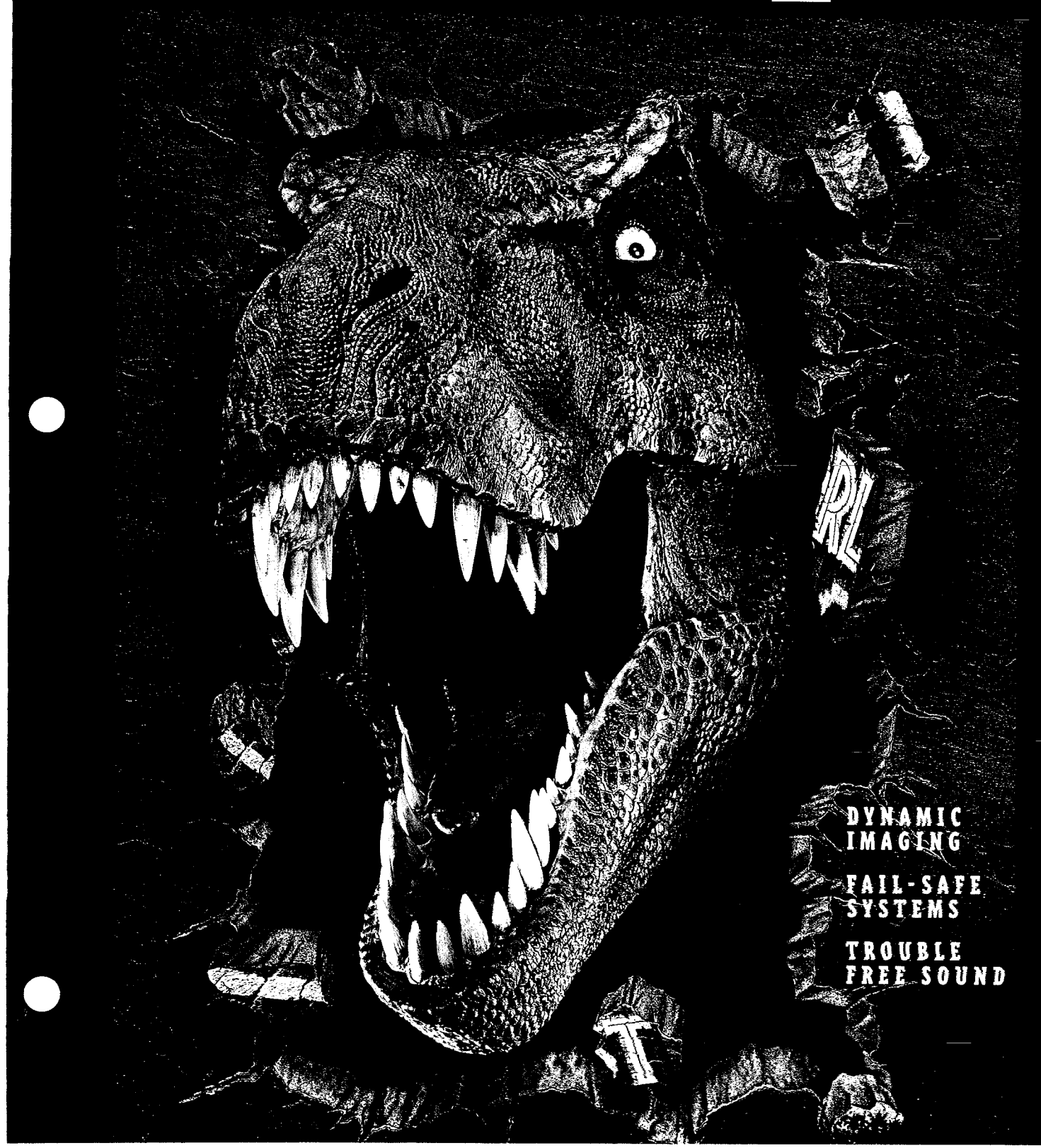
NOTES

FOR REEL PEOPLE

Kodak

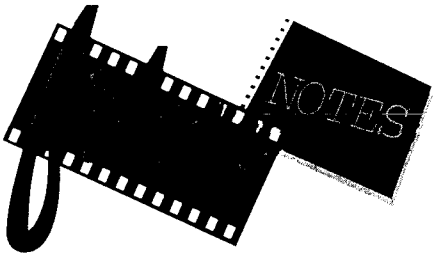
May 1997



DYNAMIC IMAGING

FAIL-SAFE SYSTEMS

TROUBLE FREE SOUND



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www.kodak.com/go/motion

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Pytlak's Practical Projection Pointers

Once again this summer, your theatres are likely to be setting box-office records. This issue of *Film Notes for Reel People* is focused upon troubleshooting potential sources of problems in your projection booth.

This past winter, we continued to hear concerns about "static cling" and "brainwraps" on certain releases. Even though almost all prints today are on polyester film stock, not all prints were affected, so it is *not* simply a "polyester problem." Kodak is very concerned about these problems which often result in lost shows, dissatisfied audiences, and damage to prints and equipment. We are making every effort to better understand static problems and help theatres cope.

Kodak has been trade testing a new ESTAR base film stock with a process-surviving antistatic layer and scratch-resistant backing. Millions of feet have been used on thousands of selected prints, with minimal static problems reported. We are well on our way to completely eliminating static problems. But for now, we offer the following advice for controlling static.

- Optimum relative humidity for film handling is *50 to 60 percent RH.* Very dry conditions (winter heating, desert climate) tend to aggravate static buildup.

- Purchase and use an *accurate humidity gauge* in the booth. Some very good electronic units with digital readouts are available (e.g., Radio Shack Model 63-855) for under $30. The cheap dial gauge units sold for home use don't hold calibration and are often inaccurate.

- If possible, *adjust the projection room HVAC* balance to maintain the humidity between 50 and 60 percent.

- If the HVAC cannot maintain the desired humidity, add moisture to the air by using portable humidifiers in the booth We suggest the use of *evaporative humidifiers* that blow air through a wet foam

Continued on Page 11

Technology

IMAGING BECOMES "DYNAMIC"

Courtesy of Universal Pictures, 1997.

The Lost World **key art makes an arresting Dynamic Image**

With the slogan "you push the button, we do the rest," George Eastman, in 1888, put the first simple camera into the hands of a world of consumers. In so doing, he made what had been a cumbersome and complicated process easy to use and accessible to nearly everyone.

Through the years, Kodak has led the way with an abundance of new products and processes that have made photography simpler, more useful and more enjoyable. Today, our business increasingly involves digital technology. Combining the power and convenience of electronics with the quality of traditional photography, Kodak produces systems that bring new levels of utility and fun to the taking, making and using of images.

Kodak's new Dynamic Imaging Technology process had its roots nearly 90 years ago. The principles of lenticular photography were demonstrated by Gabriel Lippman in 1908. Kodak itself has worked with lenticular imaging since 1930. The original application, called Kodacolor, was to provide a means to produce color images using black and white emulsion.

In the late 1960's, Kodak utilized this lenticular process for their annual reports as well as commercial applications in the form of collectible cards. In 1990, the company moved toward demonstrating successful stereo images that could be seen without viewing aids. In 1991, the first true "depth image" was produced.

The first real depth image was created by capturing a series of images with a 35mm camera traversing along a track. These images were scanned and digitized using KODAK PHOTO CD technology. A computer then repixellized the individual image files into one large composite file. The digital results were written to film which was then photographically processed. This film was then adhered to a lenticular sheet. This resulted in a high quality depth image that could be viewed directly without the use of polarized glasses.

1994 brought even more advancements in the technology as Kodak introduced the world to life-like motion in a hand-held card. With KODAMOTION Technology, up to 3 seconds of real life action can be viewed on a small card. It's proven to be a perfect way to capture a big sports

moment or a favorite movie scene.

Virtual Hard Copy was another product introduced in 1994. This product allows the addition of text or graphics to the image *after* image creation. The text may appear to be suspended in front of objects in the image or placed in a designated area that is designed into the depth scene.

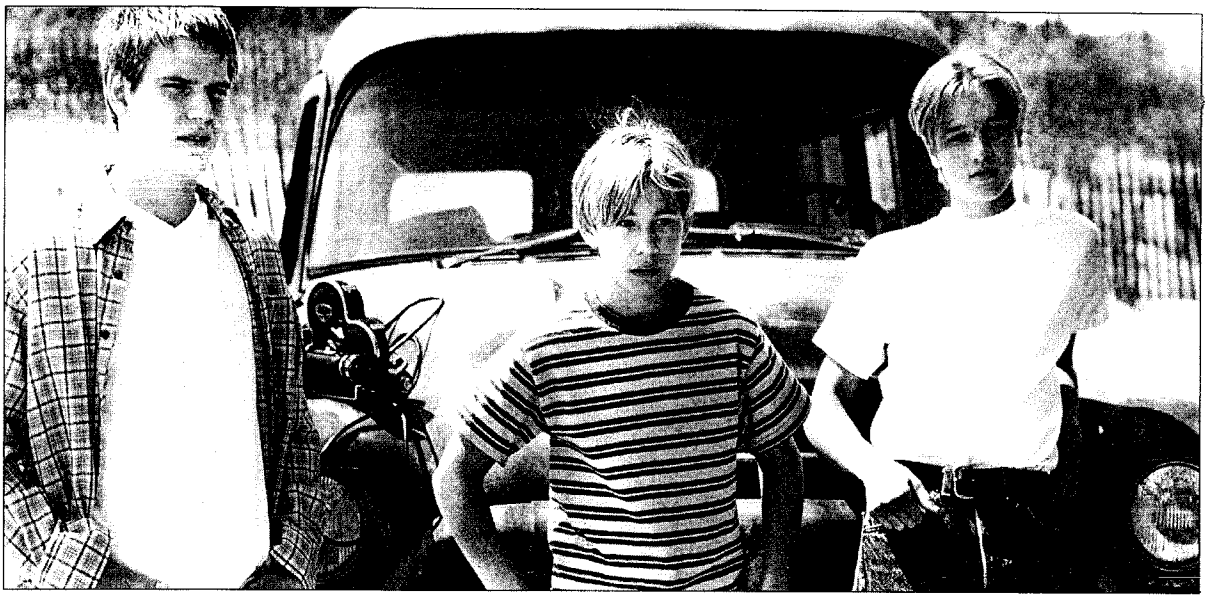
In 1994, the first large format images that were 32" by 40" inches were made possible. The following year, the technology was able to move into an even larger 40" by 50" format.

Distributors and advertising agencies alike were quite taken by the prospect of having a truly innovative method for promoting movies in theatre lobbies by using displays that were already in place. More than 75% of today's poster cases are back-lit, making the Dynamic Imaging products real eye-catchers. In the crowded environments of theatre lobbies (where as many as 20 features might be posted), a Kodak Dynamic Image stands out.

Inherent in the process is the feeling that objects (or creatures) are jumping out of the image. Viewers can also "look around" the focal point of the image to discover even more visual stimuli. *The Lost World* was a "natural" for this type of image promotion.

The cover of this publication illustrates the image that pops out and through the movie industry's first one-sheet created with Kodak's Dynamic Imaging Technology. The other image seen is the "bones" icon title art shown on page 3. Theatre patrons have been stopped dead in their tracks by this dinosaur snout (not to mention the teeth!) snapping out at them from a poster case. If the purpose of advertising is to cause a person to stop and stare, thereby remembering the product, this campaign has been unprecedented.

The launch of Dynamic Imaging Technology for promotional posters is being experienced in selected theatres during the first two holiday periods of the summer. Following Universal's *The Lost World* Memorial Day opening, Warner Brothers will utilize the technology for their *Wild America* debut on July 2.



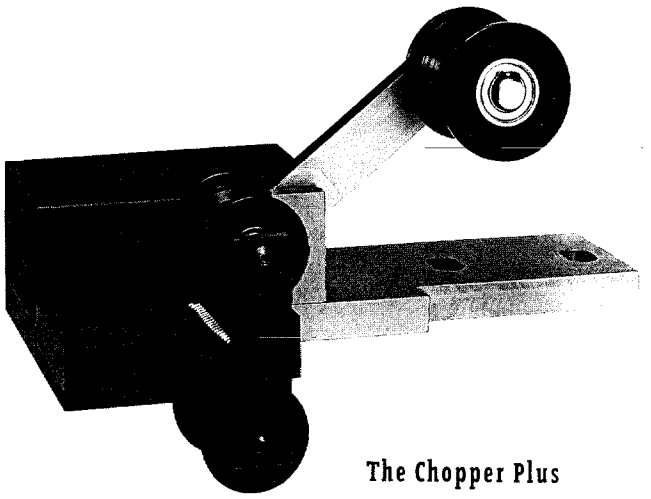
Courtesy of Warner Brothers, 1997.

Three young men embark on a photographic adventure in Warner Brothers' *Wild America*

Don't despair if you have not seen these two premier movie posters. More and more feature films will follow suit in using this type of visual imaging before the end of the year. In an always-cluttered and sometimes over-screened marketplace, some kinds of promotions stand out. Dynamic Imaging Technology lends an innovative and exciting edge to movie posters as well as other retail promotion. You'll see it with increasing frequency in any number of theatre, retail, and restaurant environments.

Fail-Safe Devices Provide Solutions

A platter brain wrap usually means disaster for both the projectionist and the audience. Not only does it interrupt the show, but it also can be a substantial hassle to an operator whose nerves are strung tight by long summer hours. Both Speco Systems and Kelmar have developed tension fail-safes to relieve stress (on the platter brain and the human overseeing it!).



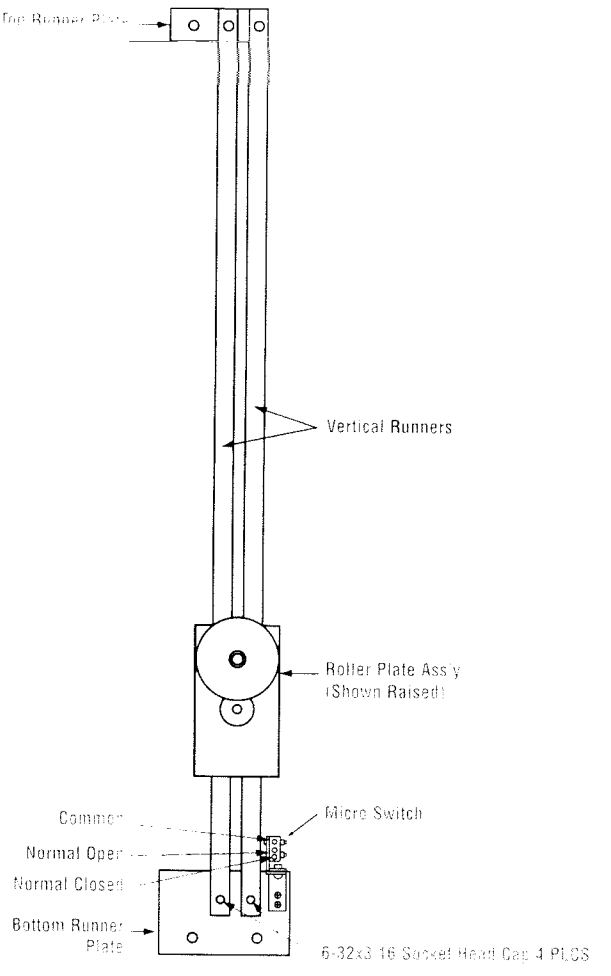
The Chopper Plus

A brain wrap occurs when the payout platter does not rotate at smooth, constant speed. If this goes undetected, a buildup of film around the payout rollers will "strangle" the brain, causing shutdown and possible serious damage to both film and equipment. Acetate stock typically breaks under this circumstance, causing relatively minor damage. Polyester stock, however, is so resistant to breakage that a brain wrap can cause gear failure and bent roller assemblies.

The Kelmar fail-safe is known as the "Chopper Plus." It is mounted atop the projector, occupying a scant half-inch of vertical space. The cutting element is guarded and will cycle only if the film jams with the projector running. A self-contained microswitch effectively shuts down the projector through the automation system. The unit is available through your theatre equipment supplier or by contacting Kelmar directly at (516) 421-1230.

The Speco Payout Overtension Fail-Safe incorporates a roller that is located at the bottom of a vertical track mounted on the platter. It allows for about four feet of film to travel with no increase in tension while the projector is coasting to a stop. While the roller is in normal position, an open microswitch is actuated to be closed. As soon as a brain wrap begins, the roller raises in the vertical track, removing the pressure on the microswitch. When the switch opens, the automation is signaled to stop the projector motor. Speco may be reached at (800) 633-5913 or you may contact your theatre equipment supplier.

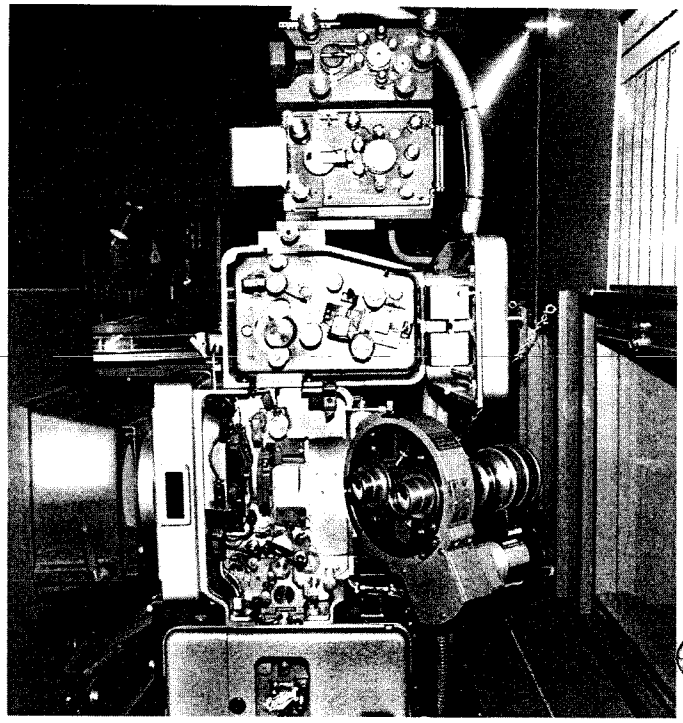
Model No. 23000



QUICK FIXES FOR

With many theatres now enjoying the wonders of digital sound, selective audiences seem to gravitate toward a presentation because of the auditorium's ability to reproduce high-tech sound. But those patrons become disappointed quickly if the sound quality, whether digital or optical stereo, leaves something to be desired.

These charts are designed so that a projectionist can quickly repair most commonly occurring sound problems. Please bear in mind that many sound problems require technical service. We highly recommend that all booth operators know how to contact a technician around the clock in the event that a dire situation causes show interruption.



Both the SDDS and SR-D Dolby digital soundheads are mounted atop the projector. (DTS is a disk synced with the film).

DIGITAL SOUND

PROBLEM	PROBABLE CAUSE	REMEDY
No sound	Digital processor not on	Turn on all power
	Film not encoded for digital playback	Replace print
	Processor not In correct mode for digital playback	Set processor correctly for digital playback
	DTS disk loaded Incorrectly or wrong disk Inserted	Reload disk or replace with disk for movie being shown (IDTS sound disk will not operate unless matched with correct film
	Digital reader not threaded	Rethread film, to include digital reader
	Digital reader threaded incorrectly	Rethread digital reader
Poor sound quality	Improper tension	Rethread projector, ensuring proper tension on all rollers
		Rethread digital reader
	DIRT on lens for digital reader	Blow dirt off lens using compressed air (should be done daily)
	DTS and automation cables not connected to processor	Connect cable, making sure that DTS pin #1 Is properly oriented
Thumping noise when DTS is in optical mode	Soundhead picking up timecode	Adjust soundhead so it does not move laterally

SOUND PROBLEMS

SOUND

PROBLEM	PROBABLE CAUSE	REMEDY
No sound*	Amplifier malfunction	Make sure patch cords are plugged in firmly
	Speaker failure	If one speaker has no sound, problem is in auditorium; if all speakers malfunction, problem is likely in booth or sound-track
	Improperly threaded projector	Rethread film with sound-track facing correct way
	Individual circuit fuses blown	Replace. Spares should always be kept on hand
	Exciter lamp burned out	Install new exciter bulb
	Blown fuse	Replace with fuse of same amperage; fuse box located at rear of sound processor
Loss of high frequency sound or poor quality sound*	Scanning beam not properly focused on sound-track	Adjust fidelity focus until best sound is heard. Use SMPTE sound test films
	DIRT or oil on scanning beam optics	Clean with approved lens cleaner and lens tissue. Maintain regularly
Garbled sound	Inadequate loop size from aperture to scanning point	Increase recommended loop size to 19-21 frames
	Film not being held securely at scanning point. Lateral guideroller pressure on sound drum Insufficient	Check roller tension spring and adjust as necessary
	DIRT or oil on sound-track	Clean with film cleaner (ALWAYS wear lint-free gloves when handling film)
Hissing sound (train)	Scratches on sound-track	Cannot be repaired. Replace print
Crackling sound (frying eggs)*	Corroded socket connections, loose wiring, or loose terminal connections	Time for a service call and thorough checkup
	Cracked diaphragm in one or more speakers...either high or low frequency	Replace. As a temporary repair, rubber cement will reduce rattle
	Loose bracket in photocell	Tighten bracket to photocell
	Loose element in photocell	Replace damaged element
Extraneous noises	Extraneous light on photocell	Shield from light
	Radio transmissions	Shield wires to interrupt antenna effect
	Amplifier feedback	Ground and shield wires

* Many sound problems require technical service. If the suggested remedies do not solve the problem, consult a qualified sound technician

In emergency situations and for equipment repair, contact a qualified service technician or engineer. For more detailed projection and sound information, contact the equipment manufacturer, your dealer or theatre supplier, or Kodak.

Scratch Free Presentations

During the manufacturing and processing of film, extreme care is taken to keep the film free from dirt and scratches. Film handlers often wear special lint-free clothing, including shoe and hand coverings. Dirt and dust are minimized through extensive air handling systems which filter the room air approximately ten times per hour.

Why all the effort? To make sure that the cinematographer, the director and the audience get the best the industry has to offer. Care should always be used when handling film to maintain the best possible image. The theatre is the final and most important link in the distribution chain.

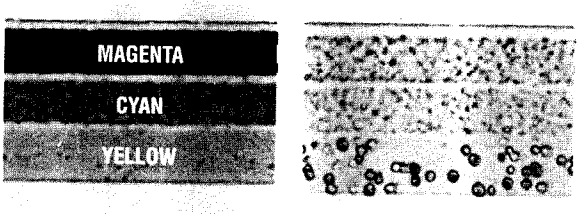
Scratches are the primary form of print damage and are easy to prevent. Everyone handling film MUST be aware of how easily a print can be scratched. Every effort should be made by YOU to minimize the amount of scratching and other damage while the film is in your care.

Before exploring the causes of scratches, a discussion of how film is made and the role it plays in image quality may be helpful.

Film Composition

Motion picture film is made of a gelatin emulsion layer, coated on a transparent plastic base. The supporting layer is called the base. The base must be transparent, free of imperfections, chemically stable, and not photographically sensitive, while remaining strong and flexible. The materials used in making film base have an influence on the amount of physical damage a film can tolerate before being rendered useless.

At present, there are two types of film base: triacetate (acetate) and polyester base. Acetate film base is made from cotton linters or wood pulp, purified and treated with chemicals and solvents. Polyester film base is made from petro-chemicals and has extremely high tear strength. Kodak's trade name for polyester base film is ESTAR.



Processed Film Raw Stock

The emulsion layers are the light-sensitive elements within which the image is formed. The typical color emulsion is 0.0003 of an inch thick. The emulsion layers consist of light-sensitive silver halide salts suspended in a gelatin layer. Color print film essentially has three emulsion layers, sensitive to green, red and blue light respectively. After printing and processing (developing), magenta, cyan and yellow dyes are formed, yielding a full-color image. The magenta dye controls the green light, the cyan dye controls the red light and the yellow dye controls the blue light.

Motion picture film damage occurs when the physical limitations of the film are exceeded. A print can be ruined in one pass through the projector or can look like new after hundreds of showings. It all depends on the care you take while the film is in your possession.

Scratches

Abrasion and scratching are usually caused by careless handling, improper threading and poorly-maintained equipment. A scratch the width of a human hair will be magnified hundreds of times in projection and ruin the image onscreen.

If the base side of the print becomes scratched, a black line will be projected. The scratch appears black because the light shining through the clear base layer is refracted by the uneven surface of the scratch.

Because the emulsion layer consists chiefly of gelatin, it is easily scratched. The depth of the

scratch in the emulsion determines the color that appears onscreen. A light scratch will project black. A scratch that has gone through the top magenta layer will project green. As it permeates the cyan layer, it appears yellow. A heavy scratch will project white, indicating the scratch has reached the base layer. The presence of scratches should always lead you to investigate the cause(s).

Dirt

Modern equipment is designed to transport film hundreds of times without producing abrasion or dirt that is visible onscreen. But the equipment must be properly maintained. You invite dirt, abrasion and scratching every time you handle film carelessly, fail to maintain your equipment or allow the cleanliness of your work area to slip.

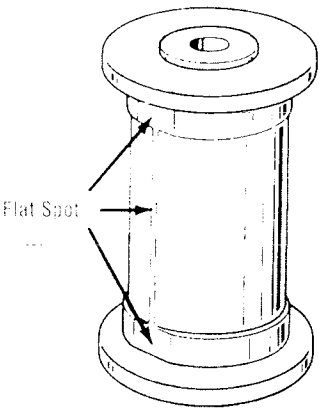
You should assess your own film-handling situation by paying particular attention to the type and amount of ventilation, the materials used for floor surfaces, and dust accumulation on your benches and equipment. Dirt on the work bench or rewind will ultimately result in poor image quality. Static electric charges generated by winding the film, especially under low relative humidity conditions, will attract dirt to the film.

It is especially important to use lint-free gloves when handling the film. Skin oils and oils from your other duties, such as projector oil on your hands, will leave imprints on the film, attracting dirt and dust particles. Film should be handled by the edges whenever possible. Try not to ever touch the actual picture or soundtrack area. Even a gloved hand can scratch the picture or soundtrack, especially when the glove is dirty.

Usually abrasion and cinch marks are caused by dirt on the film. Scratches are extreme examples of abrasion. The presence of scratching should lead you to investigate the cleanliness of pad rollers, gate, intermittent pressure pads, and sound idler rollers as well as the other channels through which the film passes.

Contact between the film and dirt or other foreign particles can be minimized in a number of ways:

1. Clean the entire film path after each performance;
2. Do not allow the film or leader to contact the floor during threading;
3. Use platter covers to protect the film and platters when not in use;
4. Keep food and cigarettes away from film handling areas;
5. Keep the floors and work areas of the projection room clean by frequent damp-wiping or vacuuming;
6. Keep the film from touching any surface that may have dirt on it. Remember, any dirt particle will be magnified hundreds of times when projected on your screen.



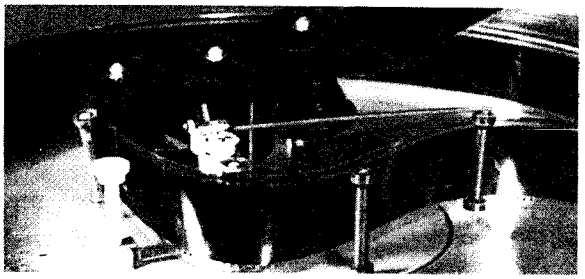
All rollers should be monitored for easy rotation. Flat spots can develop if the rollers do not turn freely and are not properly lubricated. Even if the roller rotates freely, it should be replaced immediately if it has flat spots. With the exception of the optical sound drum, there should be no contact between projector components and the image area of the film. The abrasion caused by film passing over a flat roller can be extensive, especially on a new print with a softer emulsion. Rollers with bearings that do not rotate freely must be replaced; others may be disassembled and cleaned.

After threading and before starting the projector, the entire film path should be re-examined and advanced by hand to check for proper thread-up. The film should be positively seated between the rollers' flanges. Allowing the film to ride over a flange can cause a scratch for

the entire length of the print. Make sure all of the adjustable rollers are correctly aligned. Severe scratching and abrasion can occur if film is allowed to drag across one or more out-of-line roller assemblies.

Platter

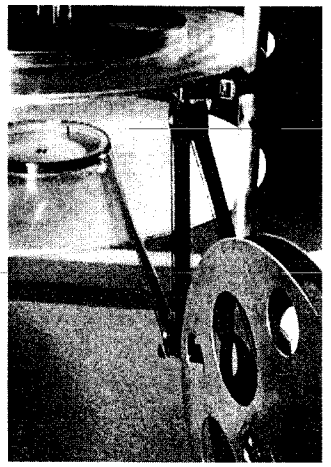
Resist pulling the film quickly through the platter centerpiece during thread-up. The film may become tightly wound around the centerpiece causing a "brainwrap" which will result in abrasion. If the feed platter has not been turned on, the same result will occur if thread-up is attempted.



Improperly positioned guide rollers may allow the film to rub on the platter surface and be scratched. Adjust the roller to the take-up platter to avoid contact between the platter and the film edge until it contacts the take-up ring. Do not over-correct or the film may ride up and spill off the ring.

Winding

During build-up and tear-down, the potential for scratching is considerable. The film path from the autowind to/from the platter should be as direct as possible with no twist. The speed dial should be placed on the minimum setting. Prior to increasing the speed, the entire film path should be checked and the alignment of the rollers should be examined.



Gradually increase the reel speed. Abrupt accelerations of the reel cause convolutions of the film to rub against themselves, causing small scratches known as "cinch marks" During the rewind process, maintain a constant winding speed. If the speed is allowed to fluctuate, loose laps of film may develop. During rewinding, film convolutions can slip against one another and cause abrasion.

Never tighten a loosely-wound reel by pulling on the film end. Maintain sufficient tension during winding so the film does not slip against itself during start and stop.

As the reel end approaches, reduce the winding speed. The tails of the reel should not be allowed to continue revolving unnecessarily. This could result in scratching and battering of the film.

Misalignment

Check the alignment of the film as it enters the feed sprocket and as it leaves the hold-back sprocket. Misalignment of the film in the gate can also cause abrasion and scratching.

Film Cleaning

Film cleaning at the theatre should remove dirt and dust, but if done improperly, will scratch the film. When utilizing a dry-web system, the film cleaning process should be monitored closely to ensure that the web does not become loaded with dirt to avoid scratching the film. Never try to clean a print by running it through a dry cloth. The rubbing action will generate a high static charge that will hold any dirt and attract even more.

We recommend particle transfer rollers (PTRs) to clean film. They are tacky polyurethane designed to pick dirt particles off film. Additionally, they are treated with an anti-stat and may be wiped clean. They are typically mounted in the film path and clean while running.

Preserve your theatre's patrons total involvement by projecting film that is free from scratches and dirt. Maintain the highest quality sound and optimum screen brightness. A film will look best if it has ALWAYS been handled in a clean environment and projected by carefully maintained equipment.

Customers thank you for your efforts by coming back!

belt or cartridge. Don't use ultrasonic or "cold mist" vaporizers that actually spray water droplets into the air. Minerals in the water will accumulate as a white powder and may cause problems with electronic equipment. Hot steam vaporizers are expensive to run and usually have insufficient capacity to humidify a large room.

- If you cannot maintain the desired humidity in the booth, it is possible to increase the moisture content of the film overnight. Place a *wet sponge* in a dish inside the film roll on the platter, and cover with a "tent" of clear polyethylene plastic (e.g., the type used for a painter's dropcloth). The film emulsion will pick up some moisture overnight. Be careful *not* to get the film, platter or components wet.

- Platters with non-conductive (plastic, enameled or anodized) surfaces tend to have more static problems than platters with bare metal surfaces. Check the surface conductivity with an ohmmeter. Non-conductive surfaces should be regularly treated with conductive anti-stats. Industrial *anti-static sprays* are available from suppliers of electronic or computer equipment for use on computer monitors and furnishings. Even laundry products intended to eliminate "static cling" (Static-Guard™, Cling-Free™, Bounce™, etc.) will help. Treat the platter surface, rollers, guide-posts, and all other non-conductive materials that contact the film. The edge of the film roll may also be treated with an anti-stat, but be careful *not* to get the film wet or sticky *do not* treat the image area with any chemical.

- *Do not* use materials such as WD-40™, silicone spray, projector oil, talcum powder, etc. on the print. They may leave visible deposits or mottle and can cause serious problems, including loss of image dyes.

- If particle transfer rollers (PTRs) are used to clean the print, use *conductive PTRs* to minimize static buildup, such as those supplied by FPC (A Kodak Company). Call FPC at (800) 814-1333 or (213) 468-5774 for more information.

- Always *winding film emulsion side in* (toward the center of the platter) seems to minimize "static cling" problems, as well as improve focus stability on large screens (see SMPTE Recommended practice RP39).

- Consider the use of static control methods such as *corona discharge ionizers* (ionized air conducts electricity to help discharge static), *anti-static brushes* (contain soft carbon or metal fibers to bleed charge away from the film) or *metal garland*. Suppliers and consultants can be found in the Yellow Pages™ under "Static Controls."

- Kodak has always recommended the use of a *tension-sensing fail-safe* when using polyester film, to minimize damage to the film or equipment should a film jam or "brainwrap" occur. These devices automatically shut off the equipment or cut the film if the tension becomes excessive. These fail-safes should be used in addition to the film break detectors that simply sense when the film breaks or runs out (see related article on page 5).

As always, let Kodak know about film-related problems. We'll try to help where possible and will use the information to further improve our film products. My e-mail address is **jppytlak@kodak.com**

Don Rogers Named Inter-Society Award Recipient

Retired Warner Brothers Post Production Services Senior Vice President Donald C. Rogers was named winner of the Ken Mason Inter-Society award at the ShoWest convention held two months ago in Las Vegas.

The prestigious silver bowl is given annually to an industry giant—one whose entire career exemplifies enhancement of the motion picture experience.

Don began his career in the 1950's at 20th Century Fox as a sound boom operator. His first project was *There's No Business Like Show Business*. In no time at all, Don was on a first-name basis with its star, Marilyn Monroe. They remained friends until her death and he worked with her on four more films. In 1960, he went to work for Todd-AO as a recordist. His first project was *Spartacus*. After a six-month crash course in photography, he became head of the camera department, traveling the world on such films as *The Sound of Music* and *The Bible*. He was involved with the development of the first lightweight 65mm production camera as well as the Todd-AO 35mm wide-scope lens system.

Rogers moved to Goldwyn Studios, serving as director of technical operations from 1971-92. During that time, the Goldwyn sound department received 23 Oscar nominations leading to 15 Oscars. Since 1992, he has been at Warner Brothers and has successfully rebuilt their post-production center. Since his retirement, he has remained at Warner Brothers as a consultant.

During his career, Don contributed to more than 1,000 motion pictures. Some of his favorites are *Star Wars* (which won an Academy Award for sound and was the first use of Dolby-A stereo), *Top Gun*, and two other Oscar winners for sound, *Raiders of the Lost Ark* and *The Empire Strikes Back*.

When Don proposed that a special Oscar be given by the Academy in 1981 for scientific and technical accomplishments, he had no way of knowing that his peers would vote him to be the recipient 15 years later. Today, he is still a member of the Academy of Motion Picture Arts and Sciences, a member of BKSTS, a fellow of SMPTE, and other industry affiliations too numerous to detail.

Kodak congratulates Don Rogers on this recognition of a remarkable career!

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