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Why exhibitors should join…

The Scanning Revolution

By Joseph Hull, Marketing Communications Manager, Dolby Laboratories

Since sound was introduced to movies, almost every aspect of motion-picture production and exhibition has changed radically. A major exception, however, is the way in which analog optical soundtracks are provided on release prints. The complex silver-applicated track has remained the norm for more than 50 years.

For a long time the industry has recognized the potential advantages of substituting an easy-to-process dye track for the silver-based track, and laboratories have long had the capability of doing so. But both inertia and limitations in scanning technology have stood in the way.

In recent years, both of these barriers have begun to come down. First, a vital new impetus to change to dye tracks has surfaced in the form of environmental concerns over both the chemicals used in processing silver-applicated tracks and the disposal of used film. Second, the introduction of high-output, red light-emitting diodes (LEDs) has made it practical for the first time to read dye tracks, which conventional exciter-lamp heads cannot.

As a result of these developments, four years ago Dolby Laboratories introduced a new approach to scanning optical soundtracks. If adopted universally, and it has already been installed on 28,000 projectors worldwide, this new approach will make it possible for the industry to convert at long last to a dye track-specifically, a cyan dye track that precisely complements the new red LEDs.

Dolby's new approach to scanning soundtracks goes beyond just a new light source. It also utilizes a reverse-scan configuration, rather than the conventional forward-scan system, for better sound in addition to the practical benefits that accrue with the use of a dye track.

Benefits of the new approach

First of all, in the laboratory, use of dye tracks will enormously simplify print manufacturing. In addition, eliminating the redevelopment process will reduce the amount of wasted stock, a potential cost saving.

In the theatre, the new LED arrays typically last 15,000 hours, age very gradually over time, and provide ample warning when replacement is needed. In contrast, exciter lamps last only 3,000 hours or so, then fail catastrophically, often bringing the show to a halt. Furthermore, installing a new LED array in a reverse-scan configuration requires no critical alignment, because light is focused onto the solar cell after it passes through the soundtrack, rather than being focused directly from the light source onto the film as with forward scan (see Figures 1 and 2). As result, with reverse scan the distance between the light source and the film is nowhere near as critical.

Finally, sound quality improvements include improved response at high frequencies on high-level sounds, and a potential reduction in distortion, as a result of more consistent soundtrack illumination. Stereo separation is also improved, because there is less scattering of the light that reaches the solar cell, so that light from the Lt and Rt tracks are more tightly confined to their respective cell elements. It should be noted that these sonic improvements are the result of the reverse-scan configuration, and do not accrue by simply replacing the exciter lamp in a forward-scan installation with an LED array.

What's being done

The new approach to soundtrack scanning has so many benefits that today every projector model available in the U.S. offers it as standard. However, because many conventional heads with exciter lamps, which cannot read dye tracks, are still in use, it will not be practical to release dye-track prints for three to four more years, until approximately 90% of all projectors in use are fitted with the new scanners.

There is an intermediate stage, however, which the industry is now beginning to implement. Conventional scanners may not be able to read dye tracks, but the new reverse-scan LED units *can* read all silver-applicated tracks. Admittedly, badly-recorded, "spitty" dialogue can sound slightly worse with the new type of scanner. But even this minor drawback is completely eliminated by the use of silver-applicated tracks incorporating a so-called "high-magenta" dye layer that are 100% compatible with both scanning technologies (see Figure 3). To test this concept, 100 prints with high-magenta tracks of the recent Warner Bros. feature *City of Angels* were distributed with complete success.

The move to high-magenta silver-applicated tracks, and ultimately to cyan dye tracks, is an industry-wide one, spearheaded by Technicolor, Kodak, and Dolby. Currently all major U.S. laboratories are gearing up for making high-magenta prints, as are the first European labs.

What exhibitors can do

Particularly with the advent of prints with high-magenta tracks, all exhibitors should convert existing projectors as soon as possible. Doing so will reap many of the benefits of the new scanning technology right away, while helping the industry reach the critical mass of equipped projectors necessary for the release of prints with cyan tracks. When that day comes, the new approach to soundtrack scanning pioneered by Dolby Laboratories will reach full flower, ensuring analog presentations that rival digital in overall quality, but with all the eagerly-anticipated simplicity of the dye track.

Illustrations:

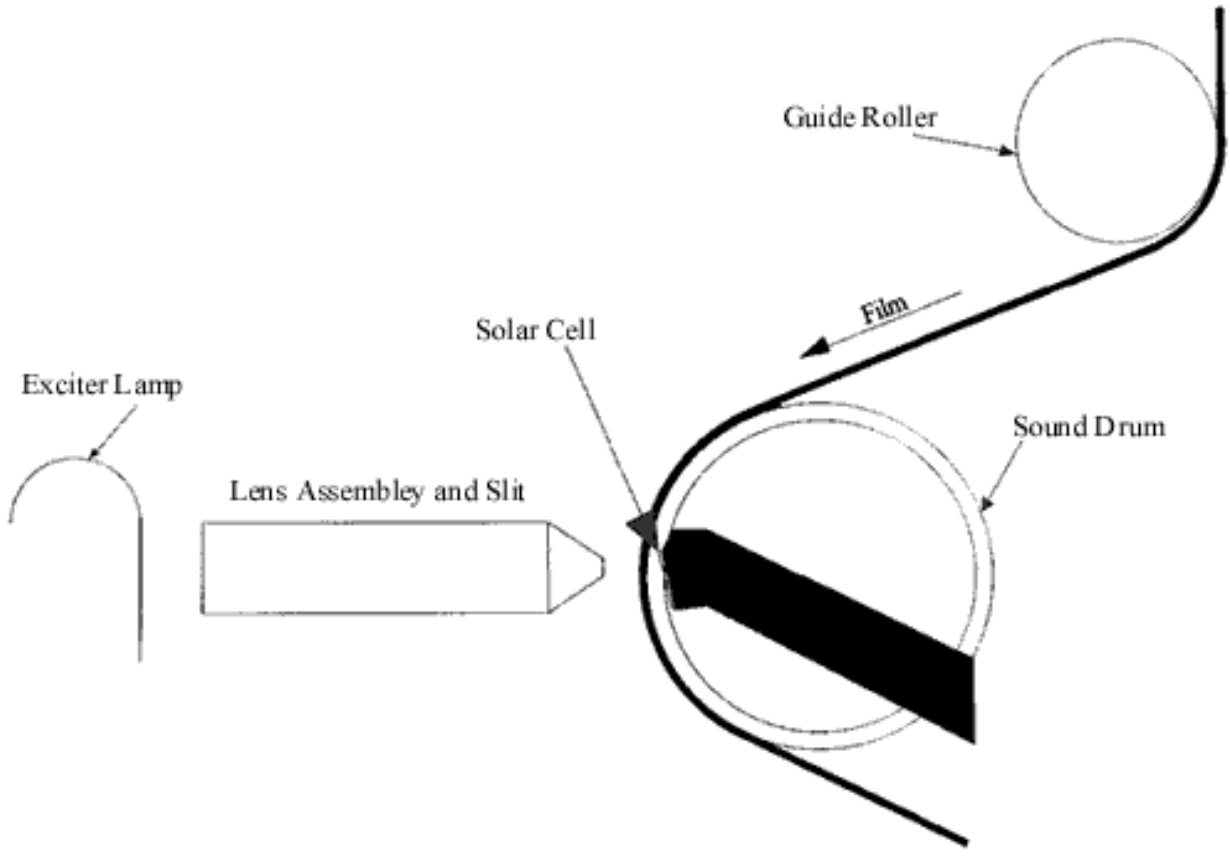

Figure 1. Forward-scan soundhead with exciter lamp.

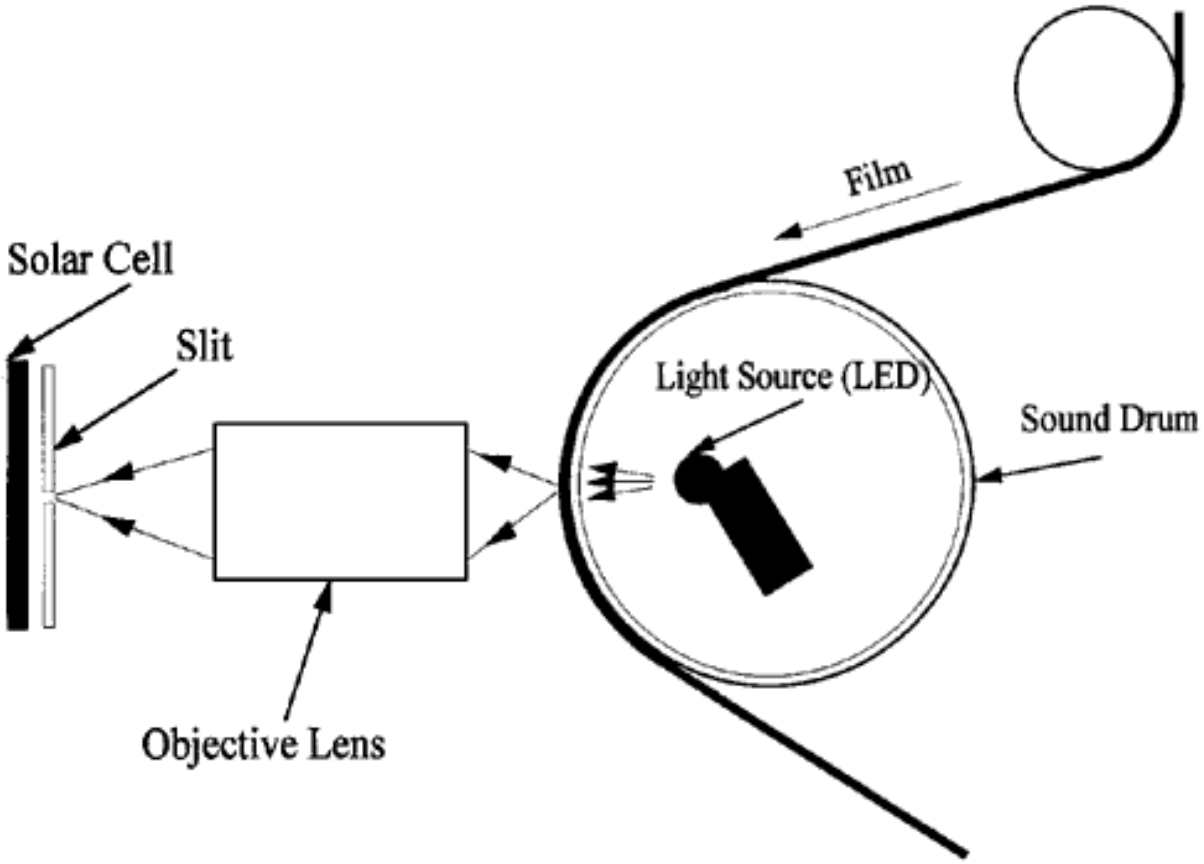

Figure 2. Reverse-scan soundhead with red LED array.

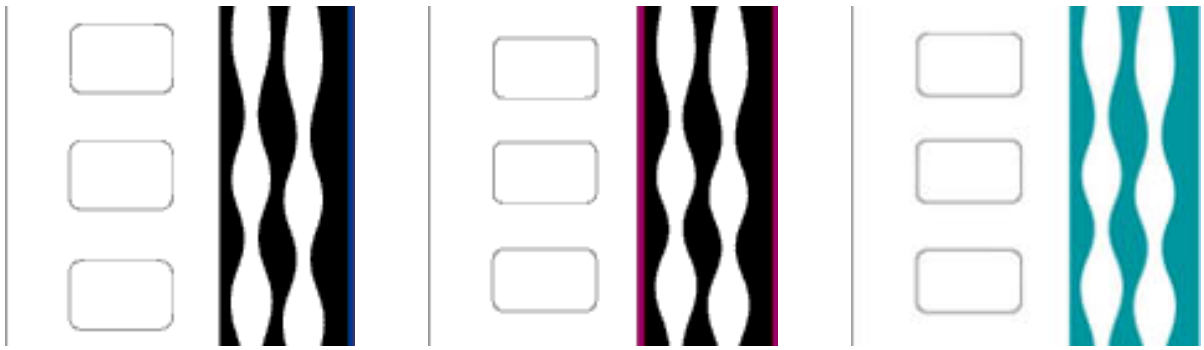

Figure 3. Left to right: Conventional silver-applicated soundtrack, silver-applicated track with "high magenta" dye layer, and cyan dye-only soundtrack.