# illuminate

innovation that ignites creativity

## iConform

SD to HD 2K or 4K

directly from your film originals

without EDLs

# About illuminate

illuminate Hollywood has been a trusted partner to producers since 1995. Clients come to us for our technical expertise, and because we are known to always go the extra mile. From StarTrek to Harry Potter 7, Jack Bauer-24 & The X-Files, our roster of projects and clients speaks for itself.

## illuminate Hollywood consists of two facilities in the same neighborhood:

**illuminate Post/Digital finishing on Cahuenga Boulevard in Hollywood**

* Digital intermediates
* Film restoration
* Film coloring
* Linear & non linear editing
* Color correction
* 3D rendering
* Special effects
* SD to HD 2K & 4K conforming from original film, without EDL
* Digital Intermediates
* Visual Effects & Graphics

## illuminate Studios, down the street

* HD multi-camera production
* 3 fully equipped stages
* Kitchen and talk show sets
* Green screen
* Green rooms'
* Red camera rental
* Live streaming
* Social TV: twitter & Skype feeds
* Satellite broadcasting

# Introduction

The libraries of the major feature film and television studios, independent producers and distributors are full of assets sitting idle that could be generating significant revenues. These films or TV series are not marketable because the existing broadcast masters do not meet current high-definition broadcast standards. Thousands of television series, MOWs (movies of the week) and direct-to-video films were shot on film and only exist for broadcast or distribution in standard-definition NTSC or PAL.

Unfortunately, those assets generally lack cut negative or edit decision lists (EDLs). Until recently, the only way to bring those assets to current broadcast standards was to re-conform the original film elements by having people watch every single frame. This process is known as eye matching. It requires going through hundreds or thousands of rolls of films, a slow, cumbersome and expensive proposition.

iConform, illuminate's proprietary technology solution, is a revolutionary process. iConform gives content owners the opportunity to bring their valuable sleeping assets back to life, creating new revenue and bringing those assets up to current HD broadcast standards. It is far more efficient, cost-effective and reliable than eye matching.

We caught up with Les Dittert to discuss the process and benefits of illuminate's iConform technology.

# An interview with Les Dittert about illuminate's iConform

**Les, you are illuminate's chief technology officer. You and your team have developed iConform. What is iConform?**

It's a technology solution that allows you to take a program that was originally shot on film and edited in SD (standard definition) and to create a current broadcast distribution master in either HD, 4k or UHD.

**How does iConform work?**

You send us all your original film assets pertaining to your program and your standard-definition reference tape, and we begin to create a new master for today's distribution pipeline. Using our proprietary technology, we find the exact scenes and takes of your program. We deliver to you within a short time an HD, 4K or UHD edited master which matches your original master.

Our technology can match color from the old master and replicate images that were repositioned.

## Does iConform work with all film and video formats?

Yes, we can handle all film formats: 16mm, Super16, all 35mm (2, 3, 4 and 8 perf), and 65/70mm.

## What kind of shows is iConform best suited for?

Any program that was shot on film, where the negative is uncut and where only NTSC or PAL masters exist. Most common are television episodics, movies of the week, specials and feature films made for home video.

## What do you mean by "automated"?

We use image processing and image recognition to find the scenes from the original show inside the film. We go through all the film rolls and find 95% of the relevant scenes without human intervention.

## Are there comparable technologies?

illuminate invented iConform; its capabilities are unique; it is 100% proprietary.

## Is iConform able to recognize all scenes, or do you need some eye matching?

A small number of scenes will trick iConform, and some eye matching will be necessary. But these are very few. I would say less than 5% of the scenes. These include scenes that were reversed or flipped, for example.

## How about special effects? How does iConform handle them?

iConform very often finds the main background elements or dominant elements in the feature. For example, if you have a shot with a ship composited, it will find the shot with the background for that.

### What output does iConform deliver?

iConform produces a frame gap report, a cut list, a pull list for opticals, a dupe list, a pull list for dupes and a 1/4" tape for Lockbox.

### Why should a studio use iConform rather than do this conversion manually?

iConform is much faster and significantly cheaper. With eye matching, you need a whole crew of people to browse all the footage by eye. This is very time-consuming, and also very expensive, even if you do it overseas. With iConform, we can complete a search overnight.

### Are you saying that you can handle the matching overnight?

The conversion process is broken down into many phases. By "overnight," I mean the initial computer search for finding the shots. But then you need to find occasional missing shots by operator. But overall, we can deliver a one-hour episode from original footage to finished product in two to three days. The timing to do an actual episode, once the pipeline is in place, is about three days. And that's for a one-hour episode.

**What kind of projects have you recently completed?**

We've done a number of feature films, MOWs and TV series. Some programs were very complex, like the 24 TV series. This program had a lot of unique four-panel, multi-panel composite shots. We were able to find every single film element in these multi-panel shots, which would have thrown a monkey wrench into doing it manually. What iConform allowed us to accomplish would not have been possible using eye matching.

**You also did Star Trek: The Next Generation season II?**

We conformed 28 episodes of Star Trek: The Next Generation. iConform worked extremely well for this project. There were a lot of single visual effects plates that we were able to find with our process. Star Trek also required us to do a lot of special effects reproduction. The client asked us to faithfully reproduce the flavor and style of the original special effects work without deviating from it.

We recreated all the visual effects under the supervision of the experts who had supervised the special effects during the original production of Star Trek.

Our understanding is that the clients and the fans are very pleased with the results.

**Can you give us an idea of the savings afforded by iConform over eye matching?**

Manually, you would have to employ a lot of eyeballs to look at a lot of footage. This is a slow and frustrating process. I would not want to be one of the people doing that. In some of the shots, the takes are so similar that it is very difficult for a person to try to decipher which one is the real take, as the differences can be down to an eye blink. To do it right without a technology like iConform would be very time-consuming and very expensive.

**What is the hardest part of the process when working with iConform?**

Paradoxically, one of the biggest parts for us is to physically handle all the film. It's a lot of boxes that need to be transported, stored, catalogued and prepped to feed the iConform process.

**Does it make any difference whether the material to be converted is a TV series or movie?**

No difference. One program may be longer than the other. The efficiencies on a TV series are better, because it's a pipeline kind of process and you can overlap multiple phases of production and gain efficiency. We also recreate the titles in these shows, and we match and recreate the original fonts in order to get a crisper text.

**What does a client have to bring to illuminate in order to have a series or film converted?**

All they need to bring is a tape of their show in its final edited state, such an SD master tape for broadcast, and all the film that was shot. The film does not need any paperwork. We do not need any EDLs. We just take the film, digitize it and use it to generate the new 2K or 4K master. That's all.

## What if a client delivers to you, accidentally, footage from some other film mixed with the correct footage?

You could accidentally provide film from some other show and it would not hurt the system. iConform will simply not find any shots from that film. You could have film from I Love Lucy in a Rambo film: iConform will instantly know that Lucy is not Rambo.

## Are there situations where iConform does not work?

If the image is flipped, iConform will not automatically find it. If the speed has been changed in editorial using Varispeed, iConform will not change the speed. But we have in-house experts who manually find the shots that may have fallen through the automated matching.

**Any other advantages to iConform?**

Once the iConform process is completed, clients are able to use the edit list generated. At that time, they know which takes belong in the show and where, and which ones do not. They may decide to keep only the takes that were used in the final master and to recycle those that are not needed. This saves on storage costs, which can be significant.

**How stable and mature is the iConform technology now?**

iConform has become a very well-oiled machine; it is very reliable.

*Thank you, Les.*

# Les Dittert, Chief Technology Officer, Illuminate

Les Dittert has been the Chief Technology Officer of Illuminate since 2007. He oversees the day-to-day activities for the company and leads the development of technological innovations.

Less Dittert has over 20 years of technology experience in media and entertainment industry and has been recognized with two Academy of Motion Picture Arts and Sciences Scientific and Engineering Awards industry awards for array CCD film input scanning systems and digital picture restoration and retouching.

His considerable technical skills speak for themselves. He developed the 14 mega pixel CCD camera for film and is recognized in the visual effects and animation industry for inventing the first digital wire removal software for Industrial Light and Magic. He then went on to build the second digital film scanner for PDI. During his tenure at Dreamworks Animation, he oversaw technical issues for the “color look” of animation feature film production.

At illuminate, Les Dittert has led the development of a number of breakthrough technologies, including a 4K scanner specifically designed for Digital Intermediate workflows, and iConform, illuminate’s breakthrough technology for transferring SD to HD 2K or UHD from film without EDLs.