



# TRIPACK

A three strip dye transfer print for DaVinci Resolve — with each of the three dyes under your own hand.

| VERSION | FORMAT            | REQUIRES                                  | LICENCE            |
|---------|-------------------|-------------------------------------------|--------------------|
| 1.0.0   | Single .dctl file | DaVinci Resolve <i>Studio</i> 18 or newer | No key, no account |

The picture is separated into three records, each record is printed to a density, each density is soaked in one dye, and the three dyes are pressed one after another onto a single blank. That is the process this models, and it is the reason the result does not look like a colour correction.

What is unusual here is not the model. It is that the three dyes are not hidden behind one knob. Cyan, magenta and yellow each have their own **density**, their own **hue**, and their own **bleed**. Nine controls where this category normally gives you one.

**Not a Technicolor product.** Nothing here is affiliated with, endorsed by, or derived from Technicolor. The process is described from published photographic chemistry, and modelled from it.

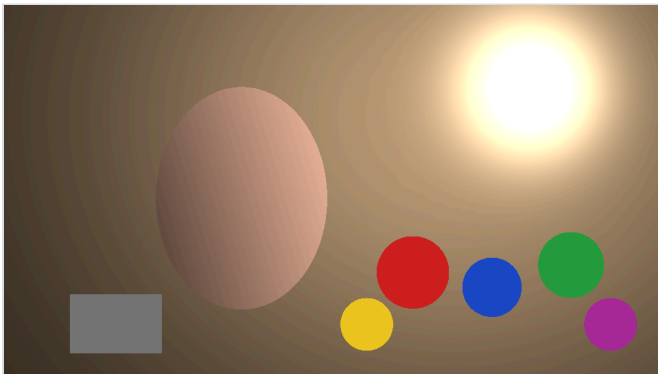
**The one rule.** A print is the last thing that happens to a picture. Put TRIPACK on its own node at the very end of the chain, after every grade and after any Colour Space Transform, and tell it what is arriving with INPUT COLOR SPACE and INPUT GAMMA. Both of those are on you — a DCTL receives pixels, never metadata.

## 01 Install, in four steps

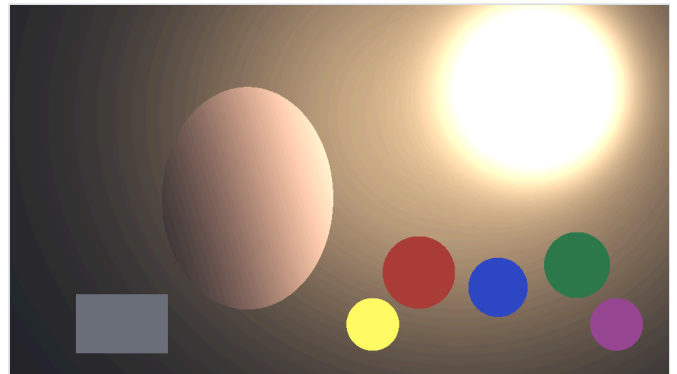
- 1 **Put the folder in the LUT folder.** On macOS that is `/Library/Application Support/Blackmagic Design/DaVinci Resolve/LUT/`. On Windows, `C:\ProgramData\Blackmagic Design\DaVinci Resolve\Support\LUT\`. Keep the **RAIF\_TRIPACK** folder around the file — Resolve shows a subfolder as its own group in the list.
- 2 **Refresh.** Project Settings → Colour Management → *Update Lists*. Or just restart Resolve.
- 3 **Add it as an effect, not as a LUT.** In the Colour page, open the Effects library, find **ResolveFX Colour** → **DCTL**, and drag it onto a node. Then pick **RAIF\_TRIPACK** from the DCTL List dropdown in the Inspector.
- 4 **Give it its own node, last.** A serial node at the very end of the chain. Grade into it, not through it.

If the controls seem to do nothing, it is almost always step 3. Right-clicking a node and choosing the `.dctl` from the *LUT* menu runs it with factory defaults and shows you no controls at all — a LUT has no Inspector panel. Quick test: turn **SPLIT VIEW** on. If no line appears down the middle of the frame, the file is loaded as a LUT.

If everything looks wrong, check INPUT COLOR SPACE and INPUT GAMMA. TRIPACK decodes to scene linear before it prints anything, and a print of the wrong decode is not a look, it is a mistake. If your timeline is already display referred, *Rec.709* and *Gamma 2.4* are the answer.



Before. BYPASS on.



After, everything at its default.

Every picture in this manual is real output from the shipped file, rendered through the same code Resolve runs. The frame underneath is a drawing, not a photograph — a page about a dye set should not be asking you to judge someone's photography at the same time.

## 02 What is being modelled

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A prism behind the lens split the image three ways onto three black and white negatives, each behind a filter. Those filters *overlapped*: they were not clean red, green and blue, and the overlap is why the separation was never perfect. Each negative was printed onto a matrix film whose gelatin swelled in proportion to exposure. Each matrix was soaked in one dye — the red record took cyan, the green record magenta, the blue record yellow — and pressed in turn onto one blank.

Two facts about that make the look, and neither of them is a matrix.

### Gelatin loading

The second dye meets gelatin already carrying the first, and takes up less of it. The third meets more still. So the *order* of transfer matters, and it matters most in the shadows, where all three dyes are heavy. That is GELATIN LOADING and TRANSFER ORDER, and it is why the deepest tones here do not simply go to black together.

### Unwanted absorptions

A real cyan dye does not absorb only red. It takes a bite out of green and blue as well, and so does every other dye. That cross absorption is where the palette comes from — it is not an error to be corrected, it is the thing you are buying. Each dye's share of it is its BLEED, and which way it leans is its HUE.

### Why it cannot be a matrix

Densities add; transmittance multiplies. The light that gets through a stack of dyes is  $10^{-D}$  where  $D$  is the sum of what each dye absorbs. A  $3 \times 3$  matrix adds *light*, so it can be tuned to agree with a dye stack at one exposure and will disagree everywhere else. This is the single reason a print film LUT and a real dye stack part company in the shadows.

**Grey is normalised on luminance, never per channel.** The print is scaled so that a printed 18% grey comes back at 18% *brightness*. Doing that per channel would divide out the cast the dye set puts on a neutral, and that cast is the whole point of a dye set. The consequence you will feel at the desk: the DENSITY sliders change *colour*, not exposure. Push cyan and the picture goes cooler, not darker.

### 03 The three dyes

This is the part that is different. Each dye is a separate object with three controls, so you are not sliding along somebody else's line between "clean" and "full" — you are building a dye set.



#### CYAN

Prints the red record. Its density is what takes red out of the picture, and its bleed decides whether the shadows go teal or navy.



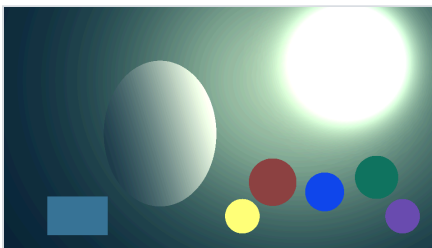
#### MAGENTA

Prints the green record. The dye skin tone is most sensitive to — small moves here are large moves on a face.

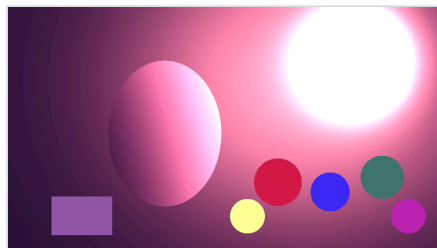


#### YELLOW

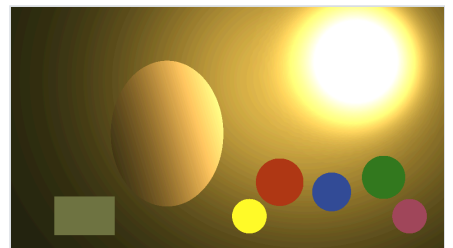
Prints the blue record. Density here sets how far blues and cyans close down, and how warm the whole print sits.



CYAN DENSITY 1.6



MAGENTA DENSITY 1.6

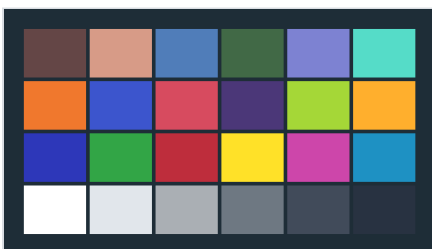


YELLOW DENSITY 1.6

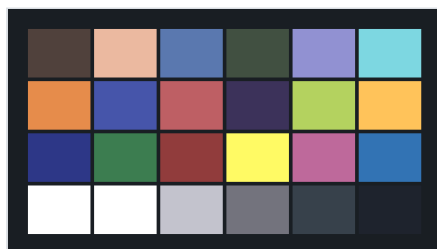
One dye raised at a time, everything else at default. Note that none of the three got darker — that is the luminance normalisation doing its job.

#### What BLEED actually is

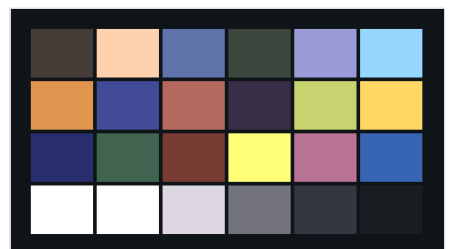
At 0 a dye absorbs only its own record: a clean, impossible ideal. At 1 it has the unwanted absorption a measured dye has. At 2 it is muddy. The chart below is the same 24 patches printed three times.



All BLEED 0 — ideal dyes



All BLEED 1 — the measured set



All BLEED 1.8 — muddy

## 04 Every control

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### Getting in and out

#### INPUT COLOR SPACE 16 choices

The gamut arriving at the node. ARRI Wide Gamut 3 and 4, ACES AP0 and AP1, Blackmagic Wide Gamut Gen 5, DaVinci Wide Gamut, Panasonic V-Gamut, REDWideGamutRGB, Sony S-Gamut3 and S-Gamut3.Cine, Fujifilm F-Gamut, Rec.709, Rec.2020, P3-D65, P3-D60 and P3-DCI.

**SET IT TO** whatever the node is actually being handed.

#### INPUT GAMMA 16 choices

The transfer curve arriving at the node. ARRI LogC3, ARRI LogC4, ACEScc, ACEScct, Blackmagic Film Gen 5, DaVinci Intermediate, Panasonic V-Log, RED Log3G10, Sony S-Log3, Fujifilm F-Log, Rec.709, sRGB, Gamma 2.2, 2.4 and 2.6, and Linear. TRIPACK decodes to scene linear, prints, and re-encodes back to the same space.

**SET IT TO** the curve the node is actually being handed. It and the gamut above ship on *Rec.709 / Gamma 2.4* — a node at the end of the chain, reading what the display is being sent. There is no *Use timeline* entry and there cannot be one: Resolve never hands a DCTL the project's colour management, so both controls carry a tooltip pointing at Project Settings > Color Management instead. Note that *Rec.709* here is the BT.709 camera curve; for a node after a Colour Space Transform to a Rec.709 display space you want *Gamma 2.4*.

**Why two controls.** They are set independently, exactly as in Resolve's own Color Space Transform, because a gamut and a transfer curve are separate facts about a file and footage routinely carries one without the other.

#### PROCESS 2 choices

*Three strip* is cyan, magenta and yellow. *Two strip* is the earlier process: a blue-green and a red-orange dye, and no blue record at all. Skin holds, yellows collapse toward pale pink, shadows go teal. It is not three strip turned down — the yellow dye is genuinely not laid.

**SET IT TO** Three strip unless you want the 1920s.

#### STRENGTH 0 – 1

Mixes the print against the untouched picture. At 0 the node is a pass-through.

**SET IT TO** 1. If you find yourself living at 0.4, the dye set is too strong — take BLEED down instead and keep the shape.

#### BYPASS checkbox

Off, bit for bit. Not a mix, not a round trip — the input is returned untouched.

### The camera and the print

#### ANALYSIS OVERLAP 0 – 0.5

How much the three camera filters overlapped before any dye was laid. Low is a clean separation the real prism never had. High desaturates the analysis, and everything downstream inherits that.

**SET IT TO** 0.12 for a plausible print, 0.02 for a poster, 0.3 when the footage is already too saturated to print.

## **PRINT EXPOSURE** -2 - +2 stops

Where middle grey sits on the print's characteristic curve. This is the only control that changes brightness.

**SET IT TO** 0, then move it if the print is sitting heavy.

## **PRINT CONTRAST** 0.4 - 2.2

The slope of that curve. Low is a soft release print; high snaps and drives more dye down at both ends.

**SET IT TO** 1.0. Below 0.8 for a flat, faded print; above 1.3 the dyes start to block up, which may be exactly what you want.

## **The dyes**

### **CYAN / MAGENTA / YELLOW DENSITY** 0 - 2

How much of each dye goes down. 1.0 is the measured set. Because grey is normalised on luminance, these move colour, not exposure.

**SET IT TO** 1.0 and move one at a time. Anything past about 1.5 on a single dye stops reading as a print.

### **CYAN / MAGENTA / YELLOW HUE** -1 - +1

Which way that dye's unwanted absorption leans, between its two off channels. Cyan's spare absorption can sit toward green or toward blue, and that is the difference between teal shadows and navy ones.

**SET IT TO** 0 for the measured dye. This is a fine control;  $\pm 0.3$  is already a clear move.

### **CYAN / MAGENTA / YELLOW BLEED** 0 - 2

How much unwanted absorption that dye has at all. 0 is an ideal dye, 1 is the measured one, 2 is muddy.

**SET IT TO** 1.0. Pull all three toward 0.4 for a clean, modern read of the process; push toward 1.6 for a dupe.

### **GELATIN LOADING** 0 - 1

How much of the blank's capacity is already used by the time the later dyes arrive. At 0 the three dyes are independent. High thins the last dye down and lifts the deepest shadows off the floor.

**SET IT TO** 0.35. Raise it for a softer, older looking shadow; drop it to 0 if you want the dyes to behave themselves.

### **TRANSFER ORDER** 2 choices

Which dye is pressed first. It only does anything when GELATIN LOADING is up — that is the point of it. The dye that goes down last is the one that gets thinned.

**SET IT TO** Cyan magenta yellow, and flip it when you want the cyan thinned instead of the yellow.

## **After the print**

### **SATURATION** 0 - 2

Applied after the print, in OKLab, so it does not drag hue as it goes.

**SET IT TO** 1.0. This is for finishing, not for fixing a dye set that is wrong.

### **SKIN ANCHOR** checkbox

Pulls hues near the skin locus back toward where they were before the print. The measurement is made on the incoming picture, so it is anchored to what you graded, not to what the dyes did.

**SET IT TO** on when you like a dye set but not what it is doing to a face.

### **SKIN AMOUNT** 0 - 1

How hard that pull is. At 1 skin is very nearly unprinted, which reads as a hole in the picture.

**SET IT TO** 0.6 and back off until it stops looking cut out.

## **SKIN HUE TOLERANCE** 0.4 — 2

How wide a net the skin gate throws around the skin hue.

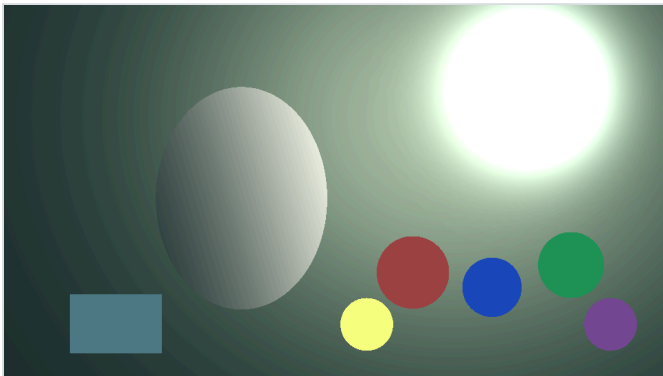
SET IT TO 1.0. Widen it for warm-lit skin, narrow it when it starts catching wood and brick.

## **SPLIT VIEW** ☐

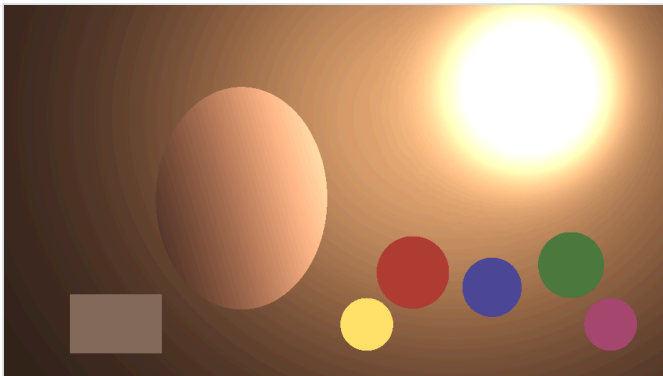
Printed on the right of the line, untouched on the left. SPLIT POSITION moves the line. It is a viewing aid — turn it off before you render.

# 05 Looks

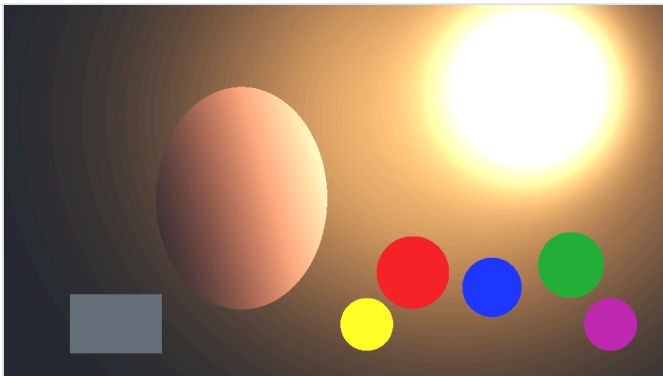
Settings tables rather than PowerGrade files: a .dri this project cannot open and verify is not something to put in a zip. Every one of these was rendered and looked at. Start from the defaults and change only what is listed.



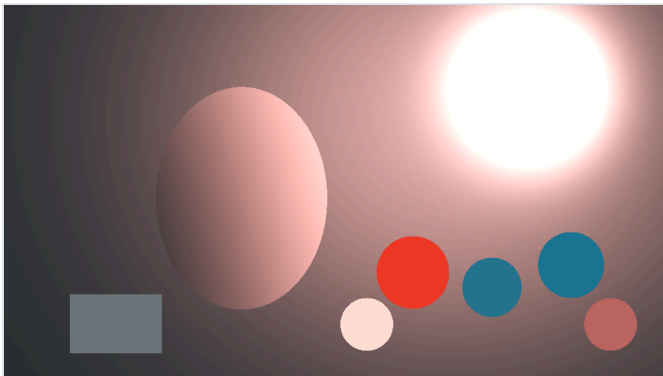
Cool shadow



Warm interior



Poster



Two strip

## Release print

The default. Nothing to change.

## Cool shadow

A heavy cyan with little unwanted absorption takes red out of the shadows without dirtying what is left; the light yellow keeps blue open. Skin stays warm.

|                 |                     |
|-----------------|---------------------|
| CYAN DENSITY    | 1.40                |
| CYAN BLEED      | 0.40                |
| YELLOW DENSITY  | 0.75                |
| GELATIN LOADING | 0.55                |
| TRANSFER ORDER  | Yellow magenta cyan |

Warm interior

The other way round — the cyan is backed off and the warm pair carry the print.

|                 |      |
|-----------------|------|
| YELLOW DENSITY  | 1.30 |
| MAGENTA DENSITY | 1.10 |
| CYAN DENSITY    | 0.85 |
| PRINT CONTRAST  | 0.85 |
| SATURATION      | 0.90 |

Poster

Near ideal dyes and a clean analysis. Loud, and nothing like a real print — which is sometimes the brief.

|                               |      |
|-------------------------------|------|
| ANALYSIS OVERLAP              | 0.02 |
| CYAN / MAGENTA / YELLOW BLEED | 0.35 |
| PRINT CONTRAST                | 1.40 |

Two strip

|                |           |
|----------------|-----------|
| PROCESS        | Two strip |
| PRINT CONTRAST | 1.10      |
| SATURATION     | 1.10      |

## 06 How it compares

Against the two things people reach for instead. The middle column is any tool whose dye behaviour sits behind a single crosstalk or amount control — that is a description of an approach, not of a particular product.

|                                              | PRINT FILM LUT | ONE KNOB DYE TOOL | TRIPACK |
|----------------------------------------------|----------------|-------------------|---------|
| Dye stack read by Beer–Lambert, not a matrix | —              | yes               | yes     |
| Per dye density                              | —              | —                 | yes     |
| Per dye unwanted absorption                  | —              | —                 | yes     |
| Per dye hue lean                             | —              | —                 | yes     |
| Sequential transfer with gelatin loading     | —              | sometimes         | yes     |
| Transfer order                               | —              | —                 | yes     |
| Two strip process                            | —              | sometimes         | yes     |
| Print exposure and contrast separately       | —              | sometimes         | yes     |
| Hue gated skin anchor                        | —              | sometimes         | yes     |
| Reads nine camera encodings itself           | —              | sometimes         | yes     |
| Resolution independent, no interpolation     | —              | yes               | yes     |
| Runs in free Resolve                         | yes            | if OFX            | —       |

The last row is honest and it is the one real cost: a DCTL is Studio only. An OFX build is planned, and that is what will bring free Resolve support with it.

## 07 What it will not do

### Run in free Resolve

DCTLs are a Studio feature. There is no workaround, and any tool that runs in free Resolve is an OFX plugin, not a DCTL.

### Carry a licence key

A DCTL is a shader. It cannot read a file, reach the network, or see a machine id, so there is nothing to key against and nothing to activate. That is a fact about the format, not a decision.

### Round trip exactly on log input

TRIPACK works in Rec.709 primaries and clamps negative light, so wide gamut colour is brought in and S-Log3 values below code 0.093 — which decode to negative light — are clamped at zero. On display referred input, STRENGTH 0 is exact to the bit. Everywhere else what holds is idempotence: running it twice gives the same picture as running it once.

## Match a particular film

It models the process, not any one title, and not a colourist's grade on that title. If you want a specific picture, this is where you start, not where you stop.