

Film Restoration OFX Bundle (DaVinci Resolve)

This project builds a set of OpenFX (OFX) plugins for film restoration workflows in DaVinci Resolve.

Included tools

- **Vertical Scratch Fix**
- **Blue Stain Fix**
- **Film Warp Fix**
- **Technicolor Registration Fix**
- **Technicolor Look**

All plugins appear under the Resolve **OpenFX** panel in the **Film Restoration** category (Color page).

Cheat sheet (1-page)

Recommended node order

1. **Film Warp Fix**
2. **Technicolor Registration Fix**
3. **Vertical Scratch Fix**
4. **Blue Stain Fix**
5. **Technicolor Look**

Fast defaults (good starting points)

- **Film Warp Fix**
 - **Strength:** 0.30
 - If lines still bow: increase Strength slowly.
 - If it looks “over-corrected”: reduce Strength.
- **Technicolor Registration Fix**
 - **Reference:** Green
 - **Shift X/Y (px):** 0
 - **Scale:** 1.000
 - If you see color fringing on edges: adjust **Shift X/Y** first (tiny moves).
 - If edges align in the center but not at the frame edge: adjust **Scale**.

- Only if needed: enable **Advanced Mode** (Rotate / Scale X/Y).
- **Vertical Scratch Fix**
 - **Strength:** 0.30
 - **Max Width (px):** 80
 - If scratch is still visible: increase Strength.
 - If scratch is wide: increase Max Width.
 - If it starts softening real detail: reduce Strength.
- **Blue Stain Fix**
 - **Strength:** 0.50
 - **Threshold:** 0.30
 - **Softness:** 0.50
 - If stain edges remain: widen the mask (Threshold/Softness) before pushing Strength.
 - If other areas are being affected: tighten the mask.
- **Technicolor Look**
 - **Strength:** 0.35
 - **Saturation:** 1.00
 - **Key Lift/Gamma/Gain/Contrast:** 0.00 / 1.00 / 1.00 / 1.00
 - **CMY Gain:** 1.00
 - **CMY Bias:** 0.00
 - If it's too strong everywhere: reduce Strength first.
 - If highlights get harsh: reduce **Key Gain** or **Key Contrast**.

Quick checking steps

1. Work on a “worst case” frame.
2. Zoom Viewer to **100%**.
3. Use **View** modes (Key / channels / grid) while tuning.
4. Return **View** to output when finished.

Quick start (beginner)

1. Install the plugins (see **Installation** below).
2. Open your project in DaVinci Resolve.
3. Go to the **Color** page.
4. Add a new node.
5. Open **OpenFX** and drag a Film Restoration plugin onto the node.
6. If the plugin has a **View** menu, use it to see masks/channels/grids while you tune.
7. When you're happy, set **View** back to the normal output.

Tip: when judging fixes (scratches/warp/registration), zoom the Viewer to **100%**.

Installation (macOS)

Option A: Installer package (recommended)

1. Run the installer `RestorationOFX-<version>.pkg`.
2. Relaunch DaVinci Resolve.
3. If Resolve was already running or doesn't show updates:
 - Clear the OFX cache (see **Troubleshooting**), then relaunch Resolve.

The installer installs bundles into:

- `/Library/OFX/Plugins`

Option B: Manual install (for development)

From the repo root:

1. Build:
 - `./scripts/build.sh`
 2. Install system-wide:
 - `./scripts/install_blustainfix.sh`
 3. Clear Resolve OFX cache:
 - `./scripts/clear_resolve_ofx_cache.sh`
 4. Relaunch Resolve.
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General usage in DaVinci Resolve

1. Go to the **Color** page.
2. Open the **OpenFX** panel.
3. Find the plugin under **Film Restoration**.
4. Drag it onto a node.
5. Adjust parameters while viewing the shot at **100% (1:1)** when judging detail.

Common controls you'll see across multiple plugins:

- **Enable**
 - Turns processing on/off without removing the effect.
- **View**
 - Switches between the final output and diagnostic previews (masks, channels, grids, etc.).

Suggested node order (simple starting point)

If you're not sure where to put things, this order is a safe starting point:

1. **Film Warp Fix** (geometry first)

2. **Technicolor Registration Fix** (align channels)
 3. **Vertical Scratch Fix** (repair scratches)
 4. **Blue Stain Fix** (fix stains/discoloration)
 5. **Technicolor Look** (creative look, usually last)
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Vertical Scratch Fix

Purpose

Reduces or removes **vertical line scratches** by detecting scratch-like structures and blending them away.

Recommended workflow

1. Add a new node.
2. Apply **Vertical Scratch Fix**.
3. Find the worst frame (where the scratch is most visible).
4. Increase **Strength** slowly until the scratch fades.
5. If the scratch is wide, increase **Max Width (px)** until it is covered.
6. If there is a preview/mask view, toggle it briefly to confirm you're hitting the scratch (not image detail).

Safe starting values

- **Strength**: 0.30
- **Max Width (px)**: 80

Key controls (typical)

- **Strength**
 - Overall correction amount.
- **Max Width (px)**
 - Maximum scratch width the detection/correction will attempt to cover.

Tips

- Use the lowest Strength that removes the scratch to avoid softening real detail.
 - If the tool starts affecting vertical edges (buildings, tree trunks), reduce Strength and try increasing Max Width instead.
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Blue Stain Fix

Purpose

Targets **blue/cyan staining** and similar chroma contamination by building a color mask and correcting pixels toward a clean sample.

Recommended workflow

1. Add a new node.
2. Apply **Blue Stain Fix**.
3. Choose a frame where the stain is obvious.
4. If there is a mask preview, turn it on.
5. Adjust the mask controls so the stain area is selected (and the rest is not).
6. Turn the mask preview off.
7. Increase **Strength** until the stain looks neutral.

Safe starting values

- **Strength:** 0.50
- **Threshold:** 0.30
- **Softness:** 0.50

Key controls (typical)

- **Strength**
 - How strongly the stain is corrected.
- **Threshold / Softness**
 - How selectively the mask isolates the stain.
- **Mask components / hue–sat–luma controls** (if present)
 - Controls what qualities are used to detect stain.

Tips

- If the stain edges are still visible, widen the mask first (Threshold/Softness) before pushing Strength.
 - If skin tones or important areas get affected, tighten the mask (more selective) rather than lowering Strength to zero.
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Film Warp Fix

Purpose

Compensates for **film gate** / **scanning warp** (bowing/curvature) using adjustable geometry and optional grid overlays.

Recommended workflow

1. Add a new node.
2. Apply **Film Warp Fix**.
3. Set **View** to a grid/preview mode (if available).
4. Adjust **Strength** until lines look straight (frame edges, architecture, horizon).
5. If the grid is hard to see, adjust **Grid Density** / **Thickness** / **Opacity** (these are just for the overlay).
6. Set **View** back to the normal corrected output.

Safe starting values

- **Strength**: 0.30
- **Grid Density**: 10
- **Grid Thickness**: 1
- **Grid Opacity**: 0.50

Key controls

- **Enable**
 - Turns correction on/off.
- **Strength**
 - Magnitude of warp compensation.
- **View**
 - Switches between corrected/original and/or grid preview.
- **Grid Density / Thickness / Opacity**
 - Only affects preview overlay (helps you judge straightness).

Tips

- Don't try to "over-straighten." If it starts looking unnatural, reduce Strength slightly.
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Technicolor Registration Fix

Purpose

Aligns separated color records by applying per-channel transforms so **RGB channels register cleanly** (reducing color fringing).

Recommended workflow

1. Add a new node.
2. Apply **Technicolor Registration Fix**.
3. Set **Reference** to the channel that looks the cleanest/most stable (often **Green**).
4. Set **View** to **Red**, then adjust Red so it lines up with the reference:
 - First use **Shift X (px)** and **Shift Y (px)**.
 - Then use **Scale** if the edges don't match.
5. Repeat for **Blue**.
6. Set **View** back to **Composite**.
7. Only if needed, enable **Advanced Mode** and use **Rotate / Scale X / Scale Y** for difficult shots.

Safe starting values

- **Reference:** Green
- **Shift X/Y (px):** 0
- **Scale:** 1.000

Key controls

- **Enable**
- **Reference**
 - The channel that remains “locked” (commonly Green).
- **View**
 - Composite / Red / Green / Blue views to judge mis-registration.
- **Scale**
 - Uniform scale for a channel.
- **Shift X (px), Shift Y (px)**
 - Translation in pixels.
- **Advanced Mode**
 - Reveals additional geometry controls.
- **Rotate (deg), Scale X, Scale Y**
 - Fine alignment for complex shrink/rotation differences.

Tips

- Work at **100% zoom**.

- Use a high-contrast edge (white text, window frames, specular highlights) to see color fringing clearly.
 - Small changes matter: start with shifts of 0.1–1.0 px.
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Technicolor Look (CMY separations keyed by luma)

Purpose

Creates a Technicolor-inspired look by separating the image into **Cyan/Magenta/Yellow** components, shaping those components, and recombining them. The strength of the effect is **keyed by luma** (brightness) from the input.

Recommended workflow

1. Add a new node near the end of your node tree.
2. Apply **Technicolor Look**.
3. Start with **Strength** and **Saturation**:
 - Increase **Strength** until you see the look.
 - Adjust **Saturation** so it doesn't get too strong.
4. Control where the effect shows up (bright vs dark areas):
 - Set **View** = **Key**.
 - Adjust **Key Lift** / **Gamma** / **Gain** / **Contrast** until the key looks right.
 - Set **View** = **Output**.
5. If you want to push the look:
 - Increase **Cyan/Magenta/Yellow Gain** a little.
 - Use **Bias** controls gently (small moves).
6. Use **View** = **Cyan/Magenta/Yellow** only as a quick check, then return to **Output**.

Safe starting values

- **Strength**: 0.35
- **Saturation**: 1.00
- **Key Lift**: 0.00
- **Key Gamma**: 1.00
- **Key Gain**: 1.00
- **Key Contrast**: 1.00
- **Cyan/Magenta/Yellow Gain**: 1.00
- **Cyan/Magenta/Yellow Bias**: 0.00

Key controls

- **Enable**

- **Strength**
 - Overall amount of the look.
- **Saturation**
 - Post-recombine saturation adjustment.
- **Key Gamma / Key Contrast / Key Lift / Key Gain**
 - Controls the luma-derived key that gates the effect.
- **Cyan Gain / Magenta Gain / Yellow Gain**
 - Multiplies the separated components.
- **Cyan Bias / Magenta Bias / Yellow Bias**
 - Offsets/tilts the components (use subtly).
- **View**
 - Output / Key / Cyan / Magenta / Yellow.

Tips

- If the image looks harsh in highlights, reduce **Key Gain** or **Key Contrast**.
 - If the effect is too strong everywhere, lower **Strength** first.
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Troubleshooting

Plugin doesn't appear in Resolve

- Ensure the bundles are installed in:
 - /Library/OFX/Plugins
- Clear OFX cache and relaunch Resolve.

Cache clear helper script (from repo root):

- `./scripts/clear_resolve_ofx_cache.sh`

Resolve shows the plugin but it won't load

- Reinstall using the installer or reinstall script.
 - Ensure quarantine is cleared (the installer postinstall already does this).
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Building the installer (for distribution)

From the repo root:

1. Build bundles:
 - `./scripts/build.sh`

2. Build installer:

- `./scripts/build_pkg.sh`

The output package is written to:

- `build/pkg/Restoration0FX-1.0.0.pkg`