



BROADCAST DIGITAL PAINT

PB7

The 1981 video paint studio, recreated as a native macOS instrument — and opened up to moving video.

PAINTBOX

BY MESCALINA — 2026



CHAPTER 1

The legend — the Quantel Paintbox

In 1981, a British machine turned the television screen into a canvas: the Quantel Paintbox, the first broadcast-quality digital paint system.

A cabinet of dedicated boards around a Motorola 68000, two **frame stores**, a 14-inch “Eagle” disk holding a picture library of some 160 images, an 8-inch floppy for archiving — and, in front of the operator, a **pressure-sensitive stylus** on a tablet. Everything is driven with the stylus: no keyboard, no mouse. The control panel sits at the bottom of the screen; the painting, above it.

Its software invented the vocabulary of television graphics: **paint**, **watercolour** and **chalk** modes, a palette where you **mix** your colours and **pots** to keep them, colours picked from the picture, real-time **cut & paste** through a mask — its trademark —, image fusing, **2× magnification** for pixel work, titling with drop shadows, and the picture library browsed **twelve images at a time**. All of it in 24 bits, sixteen million colours, live, on a frame grabbed from a video signal.

From channel logos to music videos, from sports graphics to record sleeves, “to paintbox” became a verb. David Hockney and Richard Hamilton tried their hand at it. Before Photoshop, this was what the digital image meant.



The Quantel Paintbox DPB 7001: the main unit with its disk, the monitor, the keyboard — and the stylus tablet, the tool for everything.

“The Paintbox serves the artist, never the other way round.” A machine designed for the hand, not for the engineer: it is this *studio-instrument* that PB7 brings back to life.

CHAPTER 2

The recreation — PB7

PB7 is a native macOS application (Swift + Metal) that recreates the complete studio — and gives it what 1981 did not have: a timeline, layers and moving video.

Faithful to the machine

- **PAL 720 × 576** canvas on dark paper, or at the size of the loaded video;
- **paint / watercolour / chalk / eraser** brushes, **stylus pressure** drives opacity;
- **eyedropper**, **pots** and a **mixing tray** where you rub your colours together;
- lasso **cut & paste**, floating selection, crop, scale;
- **2x magnifier**, drop-shadow **titling**, **picture library** twelve at a time, image fusing.

What PB7 adds

- a **background video** and up to **8** transparent **layers**;
- a multi-track **timeline**: clips, fades, opacity keyframes, markers, A/B loop;
- **rotoscoping** kit: frame by frame, onion skin, 20x zoom;
- **camera** live or as a still, • **REC** of the composite output;
- **PNG** export, **H.264 video** with sound, **layers alone as ProRes 4444 alpha**; **.pb7** projects.



PB7 canvas without video: layered washes, airbrush, flat brush, chalk, calligraphy and a title — rendered by the Metal engine at 720×576.

CHAPTER 3

The whole studio, tool by tool

Brushes

Paint, watercolour, chalk, eraser × round, flat, calligraphic and airbrush shapes. Size 2–60, stroke smoothing, pressure → opacity.

Colour

System picker, eyedropper (Alt-click), 12 pots kept between sessions, mixing tray: rub, and the shade forms under the brush.

Cut & paste

Freehand lasso, cut / copy / crop, movable floating selection, 10–400% scale, merged paste.

Titling

8 fonts, size 12–220, adjustable drop shadow; texts stay editable and movable after placing.

Media

Video → background, image → layer, image fusing, camera still or live, real-time • REC of the output.

Picture library

“Store” files the canvas away; 12-per-page grid, one-click recall, “floppy disk” archiving as a zip.

Layers & timeline

8 layers on tracks, stretchable clips, fades with handles, lock and eye, duplicate, rename.

Animation

Opacity keyframes (⌘-click), named markers, A/B loop, 1–20× zoom, snapping, frame by frame, onion skin.

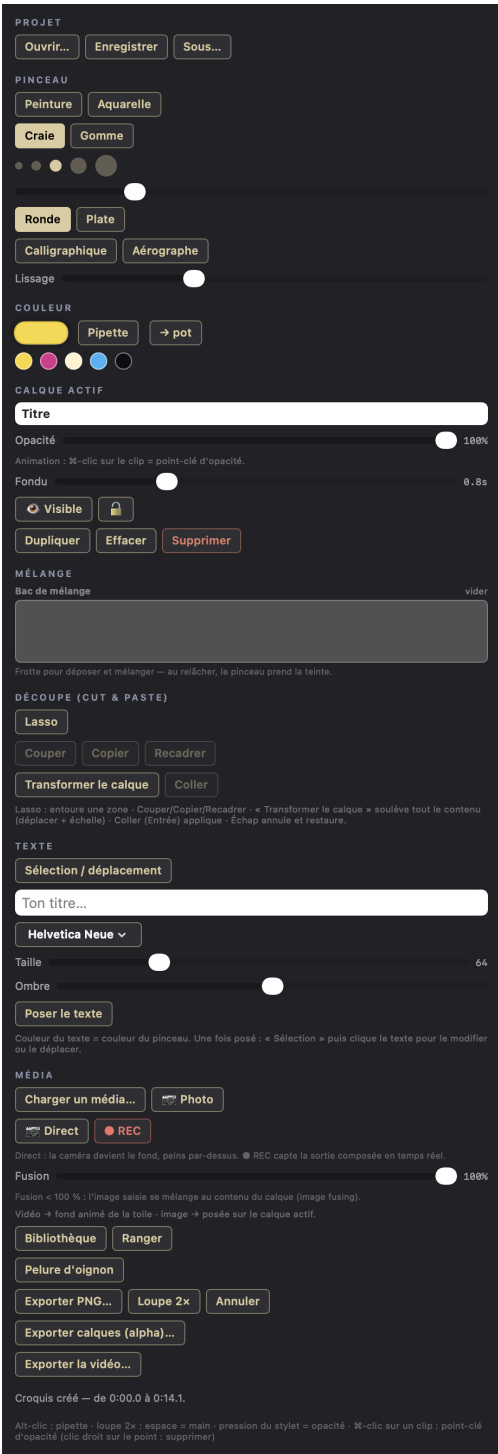
Export

Composite PNG, H.264 video (sound copied over), layers alone as ProRes 4444 + alpha, reopenable .pb7 projects.

A hands-on studio

- **2× magnifier** for pixel work, with the hand (Space) to pan the view;
- **studio shortcuts**: B / A / C / G for the modes, [] for size, ⌘Z, ⌘S;
- **stylus pressure** read natively — the mouse paints at full pressure;
- **brush cursor** at actual size, following the magnifier;
- **.pb7 projects**: a readable folder (JSON + one alpha PNG per layer), the video referenced by path.

The interface — the control panel



To the right of the canvas, the **control panel**: a scrolling column of sections. Actual capture opposite (rendered by the app itself):

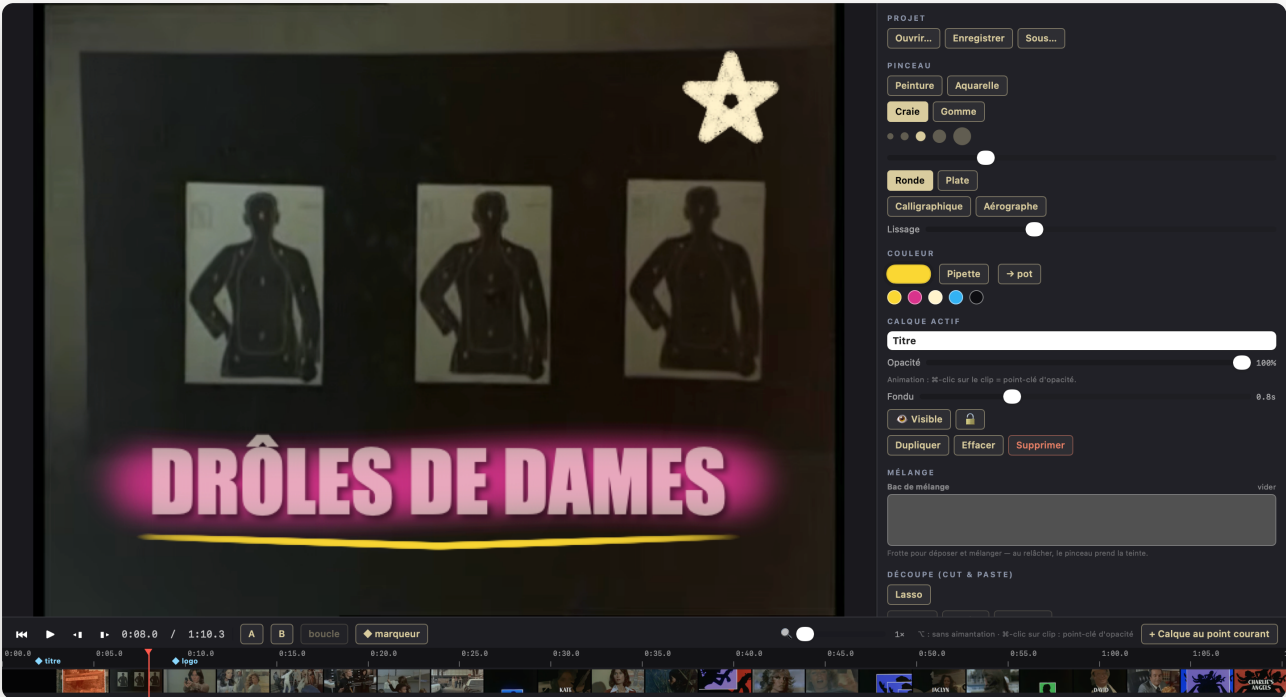
Section	Role
Project	Open..., Save (⌘S), Save as... — the .pb7 folder that holds everything.
Brush	The four modes, five sizes + slider, the four brush shapes, stroke smoothing.
Colour	Picker, Eyedropper, “→ pot” and the row of pots (up to 12, kept between sessions and in the project).
Active layer	Name, opacity, fade duration, visible / lock, Duplicate, Clear, Delete.
Mixing tray	The tray: rub to lay down and mix; on release, the brush takes the shade.
Cut & paste	Lasso, Cut / Copy / Crop, Transform layer (move + scale), Paste.
Text	Content, font, size, shadow, “Place text”; Select / move to edit a placed text.
Media	Load media..., 📷 Photo, 📺 Live, ● REC, Fusion, Library, Store, Onion skin, 2× magnifier, Undo and the three exports.

Below the last section, the studio message line (“Croquis créé — de 0:00.0 à 0:14.1”, i.e. “Sketch created — 0:00.0 to 0:14.1”) and a reminder of the gestures.

The canvas

On the left, the canvas fills all the available space (aspect preserved, dark bars). You paint on it with the stylus or the mouse; **Alt-click** picks a colour, **right-click** recentres the magnifier, **Space** grabs the magnified view. The divider between canvas and panel can be dragged with the mouse (290 to 460 px).

The timeline and the gestures



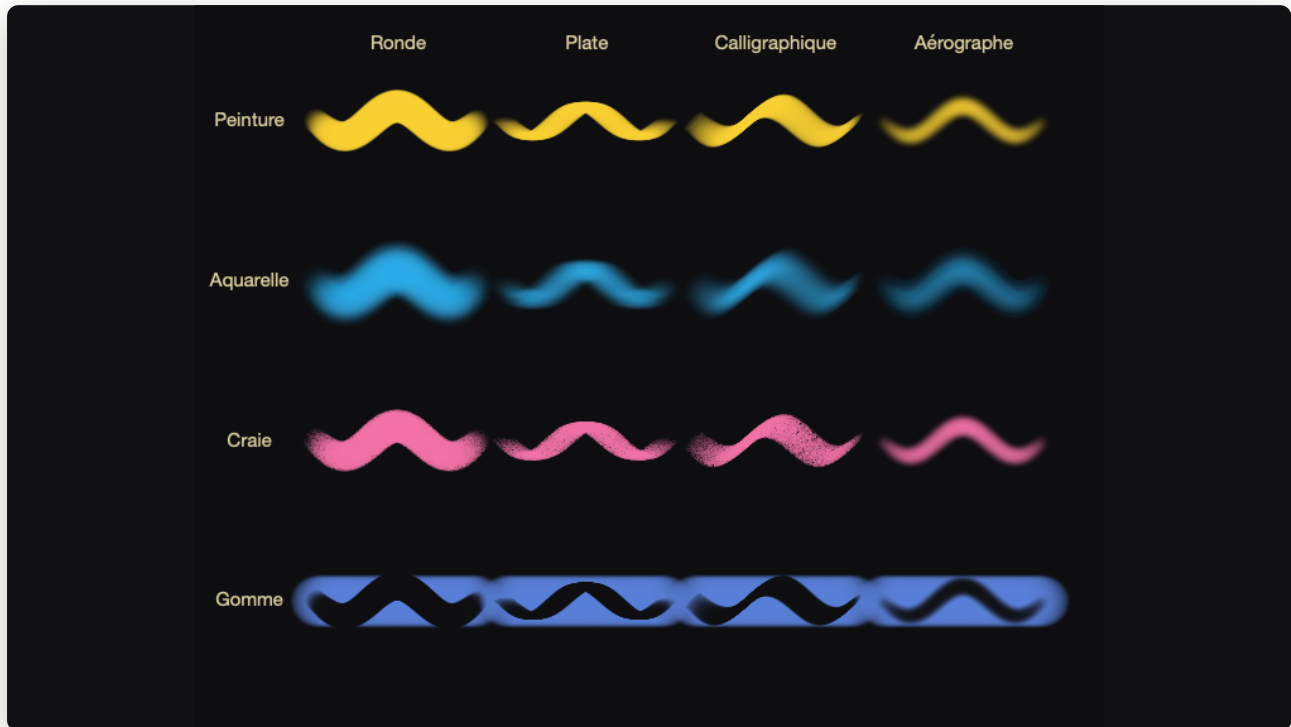
The full window: canvas, control panel, timeline. Three layers on three tracks — “Habillage” (graphics) over the whole duration, “Titre” (title) from 2 to 14 s with a fade (selected, handles visible), “Croquis” (sketch) from 6 s on; ♦ markers on the ruler.

Timeline	Function
	Start, play/pause, previous / next frame (←/→).
A · B · loop	Working loop: playback repeats the A→B excerpt.
♦ marker	Named cue at the playhead (click = go, right-click = rename / delete).
	Timeline zoom 1–20× (scrolling content).
+ Layer at current point	New layer starting at the playhead.
Ruler	Click = playhead; video thumbnails below.
Clip	Drag the middle = move in time or to another track; handles = stretch; lower handles = fades.
⌘-click on a clip	Places an opacity keyframe (height = opacity); right-click the point = delete.
Right-click on a clip	Duplicate, Hide / Show, Lock, Delete.
⌘ while dragging	Disables snapping (playhead, clip bounds, whole seconds, markers).

Shortcut	Function
B · A · C · G	Paint · Watercolour · Chalk · Eraser.
[·]	Thinner / wider brush.
⌘Z	Undo (per layer, 24 levels).
⌘S	Save the project.
⌘⌘	Delete the active layer.
← · →	Previous / next frame (pauses playback).
Space	In 2× magnifier: hand to pan the view.
Alt-click	Eyedropper.
Right-click (canvas)	Magnifier centre.
Return · Esc	Paste the floating selection · cancel and restore.

The brushes and pressure

Four materials, four shapes, and the hand pressing down: the Paintbox vocabulary fits in sixteen strokes.



The sampler: four modes (rows) × four shapes (columns), rendered by the engine on the canvas paper. The eraser removes material from the layer — here from a band of blue paint.

The four materials

- **Paint** — opaque, crisp edge, loads quickly: flat fills and lines;
- **Watercolour** — soft translucent wash, builds up with each pass;
- **Chalk** — the paper grain in the stroke;
- **Eraser** — removes material from the layer, reveals the background.

The four shapes

- **Round** — the all-purpose brush;
- **Flat** — thick and thin strokes depending on direction;
- **Calligraphic** — a flat tilted at 45°;
- **Airbrush** — very soft haze, halos and shadows.



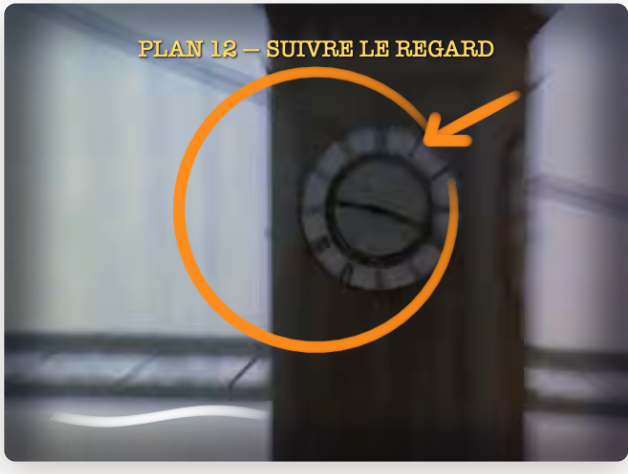
Stylus pressure: the same stroke from a light touch to firm pressure, in paint (top) and watercolour (bottom). The mouse paints at full pressure.

Specifications

Item	Detail
Platform	macOS 14+ (Apple Silicon and Intel), native application
Technologies	Swift + SwiftUI, Metal rendering (brush buffers, layer compositing), AVFoundation
Canvas	720 × 576 (PAL) on paper; at the size of the loaded video (1920 × 1080 ceiling)
Layers	8 transparent layers on tracks, fade envelope, opacity and keyframes, editable texts per layer
Inputs	Stylus (native pressure) or mouse; video (any AVFoundation format), image, camera still or live
Recording	Real-time • REC of the composite output to H.264 .mov
Export	Composite PNG; H.264 video on the source frames with the sound copied over; layers alone as ProRes 4444 + alpha
Files	.pb7 projects (folder: projet.json + one alpha PNG per layer); PNG picture library in the user folder; zip archives
Undo	24 snapshots per layer (⌘Z), including cut, paste and titling
Documentation	Illustrated step-by-step tutorial (PDF), French, English, Spanish



Title-sequence graphics: airbrush, flat brush, chalk, Impact title with shadow.



Shot annotation: painting as a working tool on video.

PB7 completes **Sandin FX** (the analogue effects synthesizer) and **Q5K** (the digital effects desk)
By Mescalina: three instruments, three ages of creative video — the laboratory, the control room, the paint studio.

Visuals: actual output computed by the PB7 engine (built-in documentation mode, `--doc-shots`) and interface captures rendered by the app (`--demo`). PB7 — By Mescalina, 2026.