KOREK 3D STUDIO 1.14.0 · TUTORIAL AND OPERATOR MANUAL · VIRTUAL PRODUCTION AND LIVE

A whole live studio on one computer.

Everything about Virtual Production and live shows in Korek 3D Studio, step by step: cameras and keying, matte objects, 360 worlds, post process, tracking and LED walls, the gallery with rundown, macros and instant replay, live streaming, guests, tally, RossTalk, the remote API, and every way to record and send the program out.



A presenter shot on green screen, keyed live into the Korek studio set

AI KEYER · DEPTH KEYING · MATTE OBJECTS · 360 WORLD · POST PROCESS · FREED + OPTICAL TRACKING · LED WALL XR · GALLERY + RUNDOWN · MACROS · INSTANT REPLAY · LIVE STREAMING · GUESTS · TALLY · ROSSTALK · HTTP API · PRORES + 4K · SDI FILL + KEY · NDI · UNREAL LINK · SAMPLE STUDIO · PRO PLATES · DOORS + STAIRS · LUMA · HSV · VECTOR

KOREK PRODUCTION

ORTHO2D.COM/STUDIO-DESKTOP

THE POWER OF KOREK 3D STUDIO

One app, the whole show

Most virtual studios are built from many boxes: a render engine, a keyer, a tracking server, a vision mixer, a graphics system, a replay server, a streaming encoder, a tally controller and a recorder. Korek 3D Studio does all of that inside one app, on one computer, with one project file. You model or import the set, put real people in it, switch cameras, run graphics, play clips, replay the goal in slow motion, take guests, stream to every platform and record a 10-bit master at the same time.

32
camera inputs, keyed live, each with its own AI or chroma key

64
shots in the switcher, with cut, mix and camera-move transitions

8
stream destinations at once, and 8 guests from their phones

4K
10-bit ProRes and DNxHR masters, SDI out with fill and key

KEYING

AI and chroma keyer

Green or blue screen, AI matte with no screen at all, or both together. Spill, choke, light wrap, clean plate, external key.

NEW IN 1.12

Matte objects

Invisible holdouts and real-foreground shapes: the presenter walks behind a car in the plate, a real desk stays in front of the set.

NEW IN 1.12

360 world

Stand your talent inside a 360 video or photo, lit by it, with a sun, real shadows and reflections on its floor.

NEW IN 1.12

Bounce light and post

Real-time global illumination like Lumen, with no grain, plus grade, bloom, fog, light shafts and MSAA + SMAA anti-aliasing.

CAMERAS

Tracking without limits

FreeD from any tracking system or PTZ camera, cranes and jibs, optical tracking from printed markers, lens distortion and zoom.

PLACEMENT

Depth keying

People stand at their real distance from the camera, so they walk behind the desk and in front of the wall by themselves.

SHOW

Gallery and rundown

Multiviewer, running order, media to air, sound cart, audio mixer, graphics and light cues: the whole control room on one screen.

NEW IN 1.12

Macros and replay

One button runs a whole sequence. Instant replay keeps the last minutes of program and cameras, plays them back in slow motion.

NEW IN 1.12

Live streaming

YouTube, Facebook, Twitch, Kick and any RTMP or RTMPS server, at the same time, with reconnects and protected stream keys.

NEW IN 1.12

Guests

Up to 8 people join from a phone or laptop on the studio Wi-Fi. They see and hear the show, and get an ON AIR light.

NEW IN 1.12

Tally and RossTalk

Phone tally lights for every camera, TSL UMD 3.1 for hardware tally, and two-way RossTalk with Ross switchers and panels.

NEW IN 1.12.4

Sample studio and 360 sets

A ready studio with a video wall in one click, and a real 360 place or HDRI around your own set, its floor matched to yours.

NEW IN 1.12.4

Cinema plates

ProRes, DNxHR, HAP, NotchLC and EXR plates up to 12K at full quality, on a dome, curved wall, flat or 2.5D, with studio lights that follow the plate.

NEW IN 1.13

Korek Link for Unreal

Any Unreal Engine level as your set: Unreal follows Korek's camera, its picture comes back over NDI, and the talent stands inside Unreal with real shadows.

NEW IN 1.14

Layers for film post

With every ProRes take: the people with their matte in one ProRes 4444 file, the clean background, an EXR depth pass and each camera on its own. Genlocked SDI out.

Included and offline. Everything in this guide runs on your own computer. Streaming, guests, tally, RossTalk, replay and macros are all included with your licence: no extra fees, no cloud service, no per-minute charges. Only the AI assistant and AI Render use Ortho2D credits; saving reference assets for them uses no credits (chapter 85).

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START HERE

The studio basics

Korek 3D Studio is also a full 3D studio: the set you go live in is built here. A quick tour of modelling, materials, the AI assistant and rendering.

- Getting started
- The screen
- Moving around
- Creating and editing
- Materials
- The AI assistant and AI Render
- Rendering
- Help on every button

S1

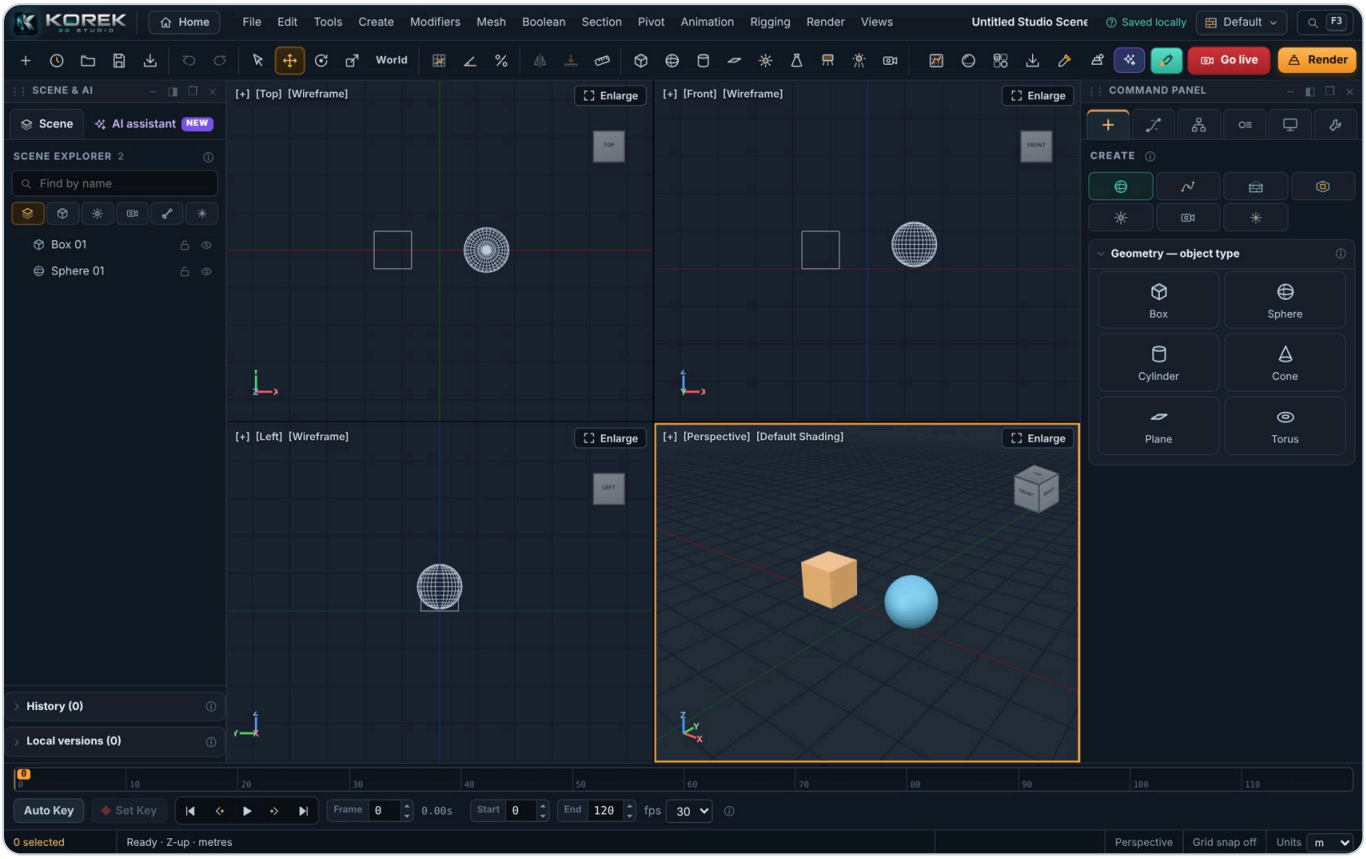
Getting started

1. **Open the studio.** In the browser go to **ortho2d.com/studio** (Chrome or Edge on a computer), or open the desktop app.
2. **Activate the desktop app** (desktop only). The first time it opens, paste the licence key shown on the ortho2d.com/studio-desktop page after your purchase. It then opens offline until the end of your licence year; after a renewal it picks up the new year by itself.
3. **Sign in** with your Ortho2D account when you want the AI assistant, AI Render or your credits. Everything else works without an account.
4. **Start working.** A new scene opens with a box and a sphere so you can try the tools straight away.

> Your work is saved automatically after every change. Use **File › Save** (`Ctrl+S`) to keep a version, and download the project to keep a file. Units are metres and Z points up.

S2

The screen



Korek 3D Studio with the sample scene: four viewports in the middle, the Scene panel on the left and the Command panel on the right.

AREA	WHAT IT DOES
Menu bar (top)	File, Edit, Tools, Create, Modifiers, Mesh, Boolean, Section, Pivot, Animation, Rigging, Render and Views. Every command with its shortcut.
Toolbar	New, open, save, download; undo and redo; select, move, rotate, scale; snaps and measure. On the right: AI, Paint, **Go live** (Virtual Production) and **Render**.
Scene & AI (left)	The Scene Explorer lists every object, light and camera: click to select, the eye hides, the lock freezes. The AI assistant tab, History and Local versions are here too.
Viewports	Top, Front, Left and Perspective. **Enlarge** or `Alt+W` makes one view big. The cube in the corner turns the view.
Command panel	Create objects and change the selected one: parameters, modifiers, hierarchy, display.
Timeline (bottom)	Frames, play, Auto Key and Set Key for animation.

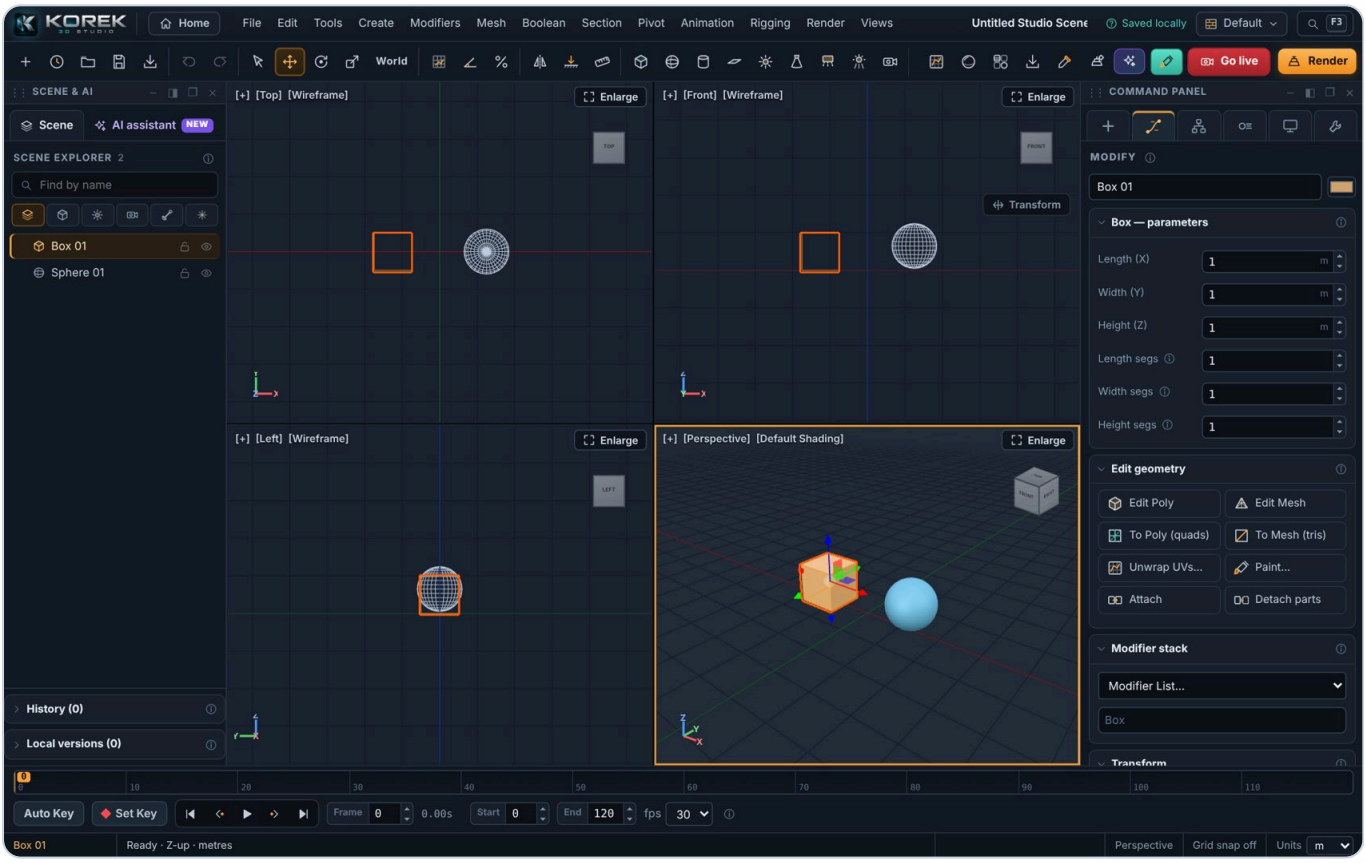
S 3

Moving around

`Middle drag` or `Alt` + left drag	Orbit in perspective, pan in the flat views
`Right drag`	Pan
`Wheel`	Zoom
`F` / `Shift+Z`	Frame the selection / frame everything
`P` `T` `Shift+F` `L` `C`	Perspective, top, front, left and camera view
`V`	Fly the camera: W A S D to move, Q and E down and up, drag to look

S 4

Creating and editing



The box is selected (orange in every view); the Command panel shows its size and segments.

Make objects

In the Command panel under **Create**, click Box, Sphere, Cylinder, Cone, Plane or Torus, then click and drag in a viewport. Lights, cameras and shapes are in the same panel. **Smart Build** (`Shift+W`) draws real walls; add doors, windows and columns to them.

Move, rotate, scale

`W` move, `R` rotate, `S` scale, `Q` select. Drag an arrow to move on one axis, a square for two. Type exact numbers in the X, Y, Z fields. `End` drops the selection onto the ground.

Edit the shape

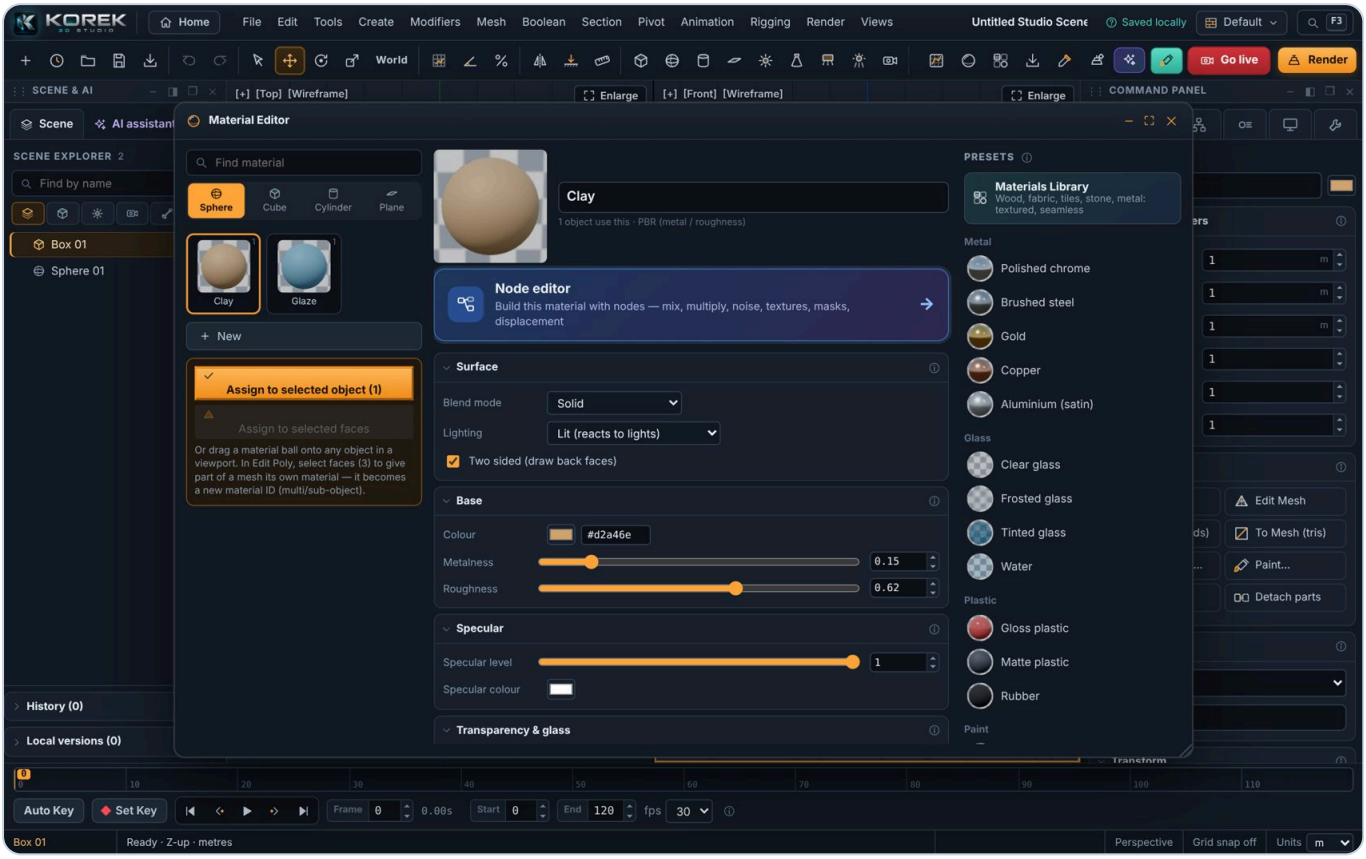
Press `Tab` for Edit Poly, then `1` points, `2` edges, `3` faces. `E` extrude, `I` inset, `Ctrl+B` bevel, `Ctrl+R` loop cut. `Tab` again to leave.

Modifiers and booleans

Modifiers (TurboSmooth, Symmetry, Array, Bend, Shell, Scatter and more) stay editable. Booleans join, subtract or intersect objects; the **Smart Boolean Cutter** (`Shift+C`) drags a live hole for a door or window into a surface.

S5

Materials



The Material editor (`M`): material settings in the middle, ready-made presets on the right.

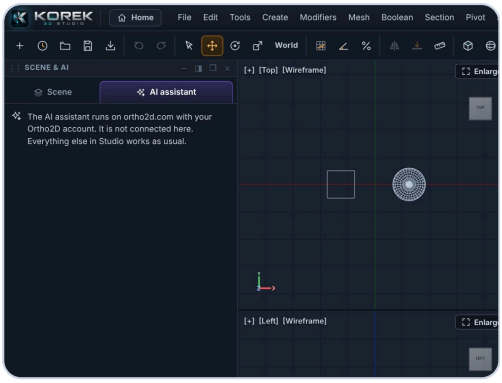
1. Select an object and press `M`.
2. Open the **Materials Library** for wood, fabric, tiles, metal and stone, or click a preset, then **Assign to selected object**.
3. Change colour, roughness and metalness, or add pictures (textures). The **Node editor** gives full control.
4. Drag a material onto any object in a viewport to apply it.
5. If a picture sits wrongly, press `U` for the UV editor. `Shift+P` paints straight onto the object.

S 6

The AI assistant and AI Render

AI assistant

1. Sign in, then open the **AI assistant** tab on the left (or the AI button in the toolbar).
2. Describe what you want, for example: *"a living room 5 by 4 m with a sofa, a rug and two windows"* or *"a TV news studio set with an anchor desk and a video wall"*.
3. Press **Build**. The cost in credits is shown on the button before you press it.
4. The AI builds the scene from ordinary objects you can move and restyle. **Undo this** removes the last build.



The AI assistant tab on the left.

AI Render

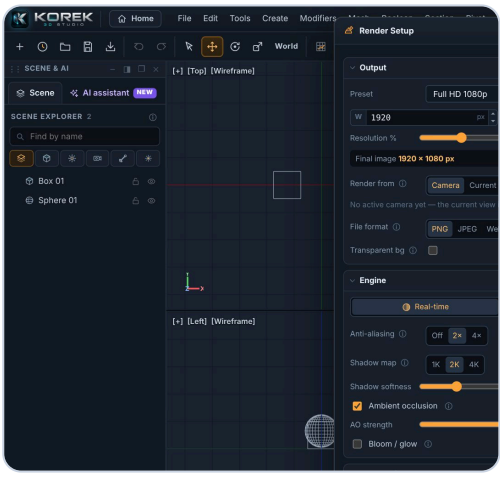
In the Render window, **AI Render** turns your camera view into a photoreal picture. **Change a material** lets you mark one area (a floor, a sofa) and change only its material. AI features use Ortho2D credits; you can buy more in the same window.

S 7

Rendering pictures and videos

1. Place a camera where you are looking: `Ctrl+Alt+C`. Look through it with `C`.
2. Press `F10` for **Render setup**: output size, real-time or path-traced engine, quality, sky and environment.
3. Press **Render** (`F9`) for a picture, or **Render animation** for a video.
4. Save it as PNG, JPEG or video.

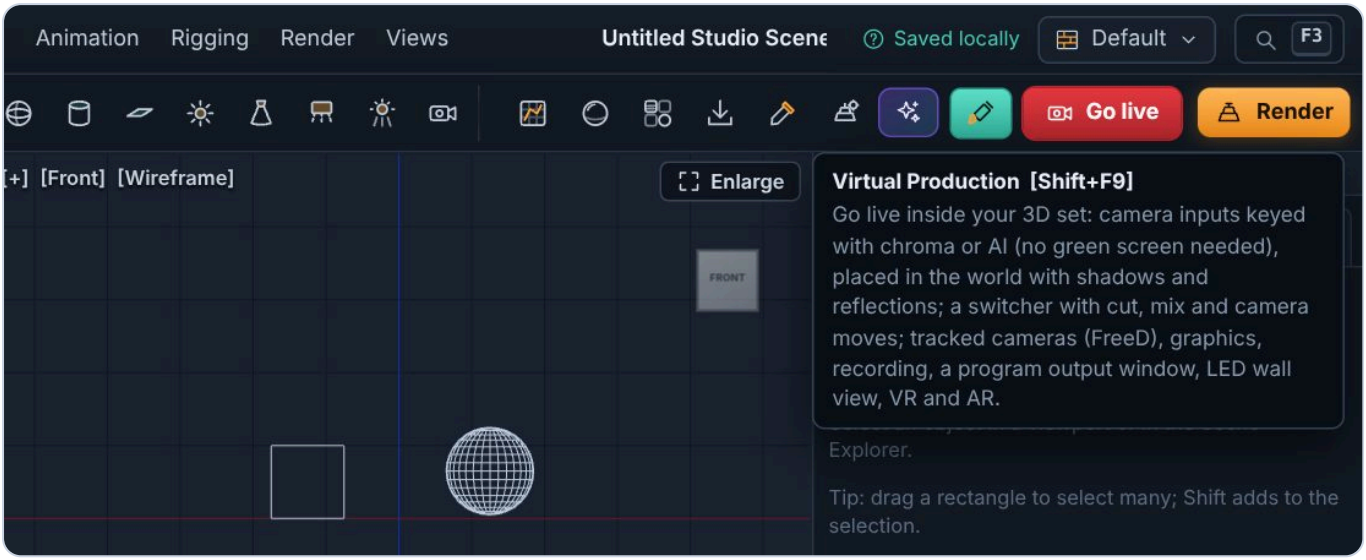
For live lighting, press `F8` (Live view) and `Shift+F8` for sky, HDRI, clouds, fog, bloom, reflections and the film look.



Render setup (`F10`).

S 8

Help on every button



Hover any button for a moment: its name, shortcut and what it does appear.

Settings with a small **i** have a longer explanation: click the **i**. Press `?` for the list of every shortcut, and `F3` to search any command by name.

PART 1

Set up the studio

Connect your cameras, key the people, place them in the set and make them belong there: matching light, shadows on the floor, reflections, and the right things in front of them.

- Before you start
- The workspace
- Cameras and inputs
- Keying
- Colour and light
- Placing people
- Shadow and reflection
- Matte objects

01

Before you start

Desktop app or browser?

Korek 3D Studio runs as a desktop app for Windows and macOS, and also free in the browser at ortho2d.com/studio. The browser is perfect for learning and for preparing a show. Anything that talks to studio hardware or the network needs the desktop app. In this guide those features carry the DESKTOP mark.

WORKS IN BOTH	DESKTOP APP ONLY
Keying, placing, shadows, matte objects, 360 world, post process, film colour, depth of field, switcher, gallery, rundown, media, sound cart, macros, instant replay, graphics, teleprompter, lighting cues, video screens, browser recording, VR and AR, optical tracking	Live streaming, guests, hardware tally (TSL), RossTalk, remote control and HTTP API, FreeD tracking, NDI output, SDI output and fill + key, ProRes and DNxHR recording, Ki Pro and HyperDeck control, DMX console (Art-Net, sACN), several computers (cluster), sending the camera to Unreal

What you need

- **A computer with a good graphics card.** A recent NVIDIA or AMD card on Windows, or any Apple silicon Mac. The faster the card, the more people, reflections and effects you can run at full frame rate.
- **A camera into the computer.** A USB webcam works to start; a professional camera comes in through a capture card or box (Blackmagic, AJA, Magewell) or over NDI.
- **A green or blue screen**, evenly lit. Or no screen at all: the AI matte cuts people out of any background.
- **Optional:** a tracking system or a PTZ camera that sends FreeD, an SDI card, a recorder, a Ross switcher, a lighting desk, a Stream Deck.

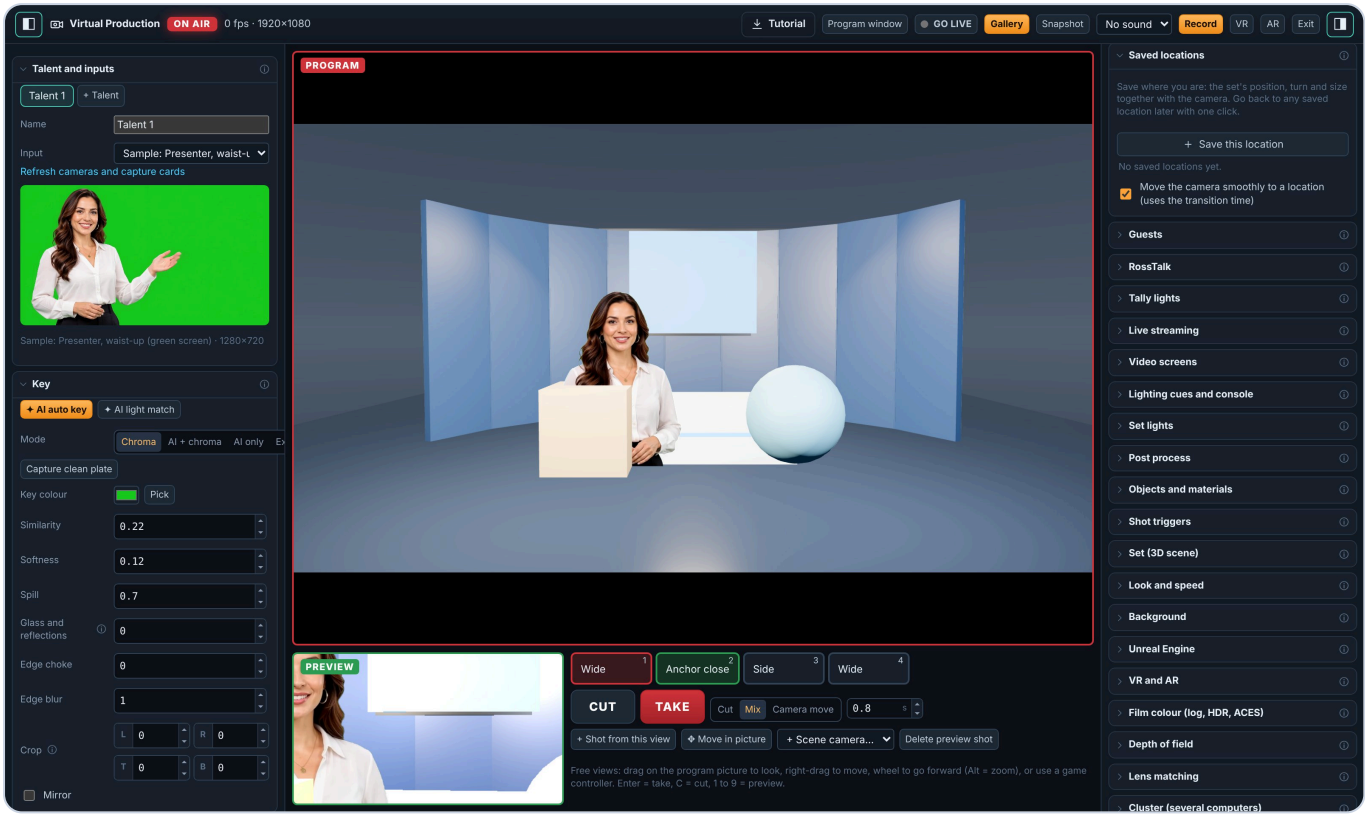
Open Virtual Production

1. Open or build a 3D scene in the Studio. Your scene becomes the set. No scene yet? You can build a ready-made set inside Virtual Production (section 09).
2. Press **Go live** in the toolbar, or `Shift+F9`.
3. A sample presenter appears so you can try everything straight away. Replace her with your own camera when you are ready.
4. Everything you set up is saved inside the project. Save before every show (`Ctrl+S`).

> Every section has an **i** next to its title: hover the title or click the **i** to read what it does. Most settings have a tip on hover too.

02

The workspace



Virtual Production with a ready-made news set: talent and key on the left, the Program in the middle with the Preview and the switcher under it, the set, show and output tools on the right.

AREA	WHAT IS THERE
Top bar	ON AIR light and frame rate, timecode (with a recorder connected), Gallery, GO LIVE (streaming), Program window, Snapshot, sound for recording, Record, VR, AR and Exit. Buttons at the sides hide or show the panels.
Left panel	The people: Talent and inputs, Key, Colour and light, Place in the world, Matte objects, Shadow and reflection.
Centre	The Program (what goes out), the Preview (what is next), the shot buttons, CUT, TAKE, the transition and its time, + Shot from this view, Move in picture.
Right panel	Show and output tools: Saved locations, Guests, RossTalk, Tally, Live streaming, Video screens, Lighting, Set lights, Post process, Objects and materials, Shot triggers, Set, Look and speed, Background, Unreal Engine, VR and AR, Film colour, Depth of field, Lens matching, Cluster, Graphics, Talent view, Pro recording, Recorders, Camera data, Remote control, Camera tracking, Tracked cameras, Optical tracking, LED wall, SDI output and Output.

Flying the free camera

In a free view, fly like in a game: `W` `S` forward and back, `A` `D` sideways, `E` up, `Q` down, the arrow keys turn and look up and down, and hold `Shift` to go three times faster. The camera eases in and out like a real operator. You can also drag on the Program picture to look around, right-drag (or `Shift`+drag) to move, and roll the wheel to go forward and back; `Alt`+wheel zooms. A game controller works too. When the view looks good, press **+ Shot from this view**.

W A S D fly a **free view**: if a scene camera or the tracked camera is on air, put a free shot on air first (or press + Shot from this view).

Search

The **Search settings** box in the top bar finds any setting by what you call it: type *fog*, *stream key*, *chroma*, *holdout*, *tally* or *replay* and press `Enter`. The right panel opens at that section and it flashes. In the Studio, **Search tools and menus** (`F3`) does the same for every tool and menu command.

Tabs on the right panel

The right panel has tabs at the top: **Set** (the world: screens, lights, post process, objects, look), **Show** (guests, cues, triggers, camera moves, graphics, presets), **Cameras** (PTZ, tracking, lens) and **Output** (streaming, recording, SDI, NDI). **All** shows every section in one list. Search switches to the right tab by itself.

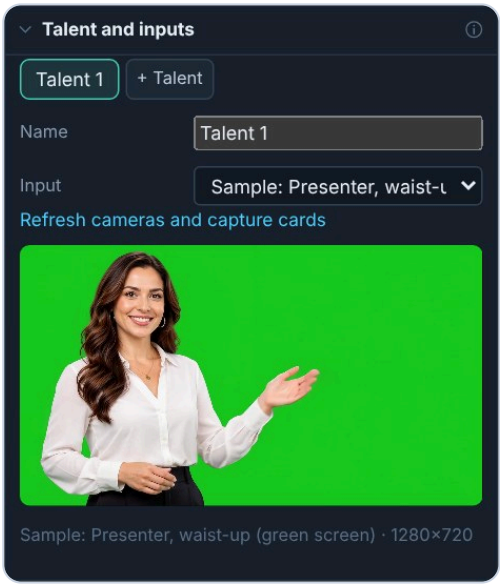
Layouts

The side panels can be resized by dragging their edges and hidden with the buttons in the top bar, so the Program fills the screen. On a small screen or a tablet the panels open as drawers.

03

Cameras and inputs

Each **talent** is one picture: usually one camera with one or more people in it. **+ Talent** adds another one (up to 32). Choose its **Input**:



Talent and inputs.

- **Camera or capture card:** a USB camera, or a professional camera over SDI or HDMI through a Blackmagic DeckLink or UltraStudio (install Blackmagic Desktop Video), Magewell, or an AJA card whose driver offers it as a camera.
- **NDI:** install the free NDI Tools; NDI Webcam Input turns any NDI source into a camera.
- **Screen or window:** a slide deck, a browser, a video call.
- **Video file:** a clip in the project, for rehearsals or pre-recorded segments.
- **Guest:** a person who joined from a phone or laptop (section 29). DESKTOP
- **Sample clips:** a presenter, an engineer at a desk, a businesswoman walking, to learn without a camera.

If a camera is missing, install its driver, plug it in and press **Refresh cameras and capture cards**. Allow camera access the first time the computer asks.

> One camera can also carry a **key signal** from a hardware keyer (External key, section 04). A **clean plate** (a still of the empty green screen) is stored per talent.

04

Keying the talent

Keying removes the green or blue screen so only the person is left.



The Key section.

Key modes

- **Chroma:** the classic green or blue screen key.
- **AI + chroma (hybrid):** the screen key, with the AI matte helping on hair, glass and difficult edges.
- **AI only:** no screen needed: the AI cuts people out of any background, on your own computer, with no upload.
- **External:** a matte from a hardware keyer on a second input (fill and key), with gain and invert.
- **None:** the camera picture as it is (a full-frame video in the set).

A clean key in six steps

1. Press ✦ **AI auto key**: it finds the key colour and sets the keyer, and explains what it chose.
2. Or press **Pick** and click the green in the camera picture.
3. **Similarity** removes more or less of the screen colour; **Softness** softens the edge.
4. **Spill** takes the green glow off hair and skin; **Edge choke** and **Edge blur** clean the outline.
5. With nobody in shot, press **Capture clean plate**: uneven light on the screen stops mattering.
6. **Crop** (left, right, top, bottom) is the garbage matte: it cuts lights, stands and the edges of the screen.

> **Good habits.** Light the screen evenly and separately from the person, keep people two or three steps away from it, and avoid green clothes. A glass or glossy table keeps reflections of the screen: AI + chroma handles them best.

05

Colour and light match

A keyed person only looks real when they carry the same light as the set. **Colour and light** has:

- **Exposure, saturation, warmth (temperature) and tint** for the person.
- **Light wrap:** the set's light spills a little over the person's edges, the way real light wraps around a body.
- ✦ **AI light match:** measures the person and the world behind them and suggests the exposure and white balance.
- **Camera colour** (with Film colour on, section 14): the curve and gamut the camera sends, for example LogC3 from an ALEXA, so the person and the set share the same light.

- **Opacity** for ghost effects and fades.



Colour and light: match the person to the set.

06

Placing people in the world

Open **Place in the world** and choose a **Placement**:

Stand in the set

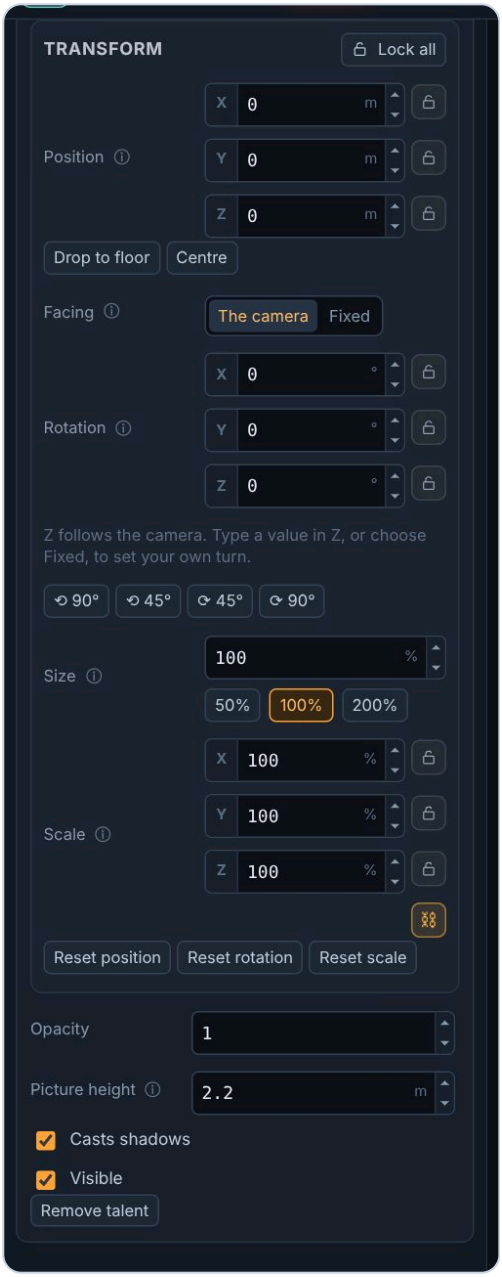
The picture stands on the floor like a life-size cut-out: **Position X Y Z** (where the feet are, in metres), **Rotation** with 45° and 90° buttons, **Size** and **Scale X Y Z**. **Facing: the camera** keeps the picture turned to the virtual camera. Best for locked-off cameras and free virtual moves.

Depth keying

The person is placed at their **real distance** from the camera, measured from where their feet meet the floor in the picture. Virtual objects closer to the camera hide them; objects farther away stay behind them. They can walk behind a virtual desk and come out in front of it, with nothing to animate. Best with a tracked camera, or a locked-off camera matched to the shot. **Auto** measures the distance all the time; **Manual** uses the distance you type.

Locks and Move in picture

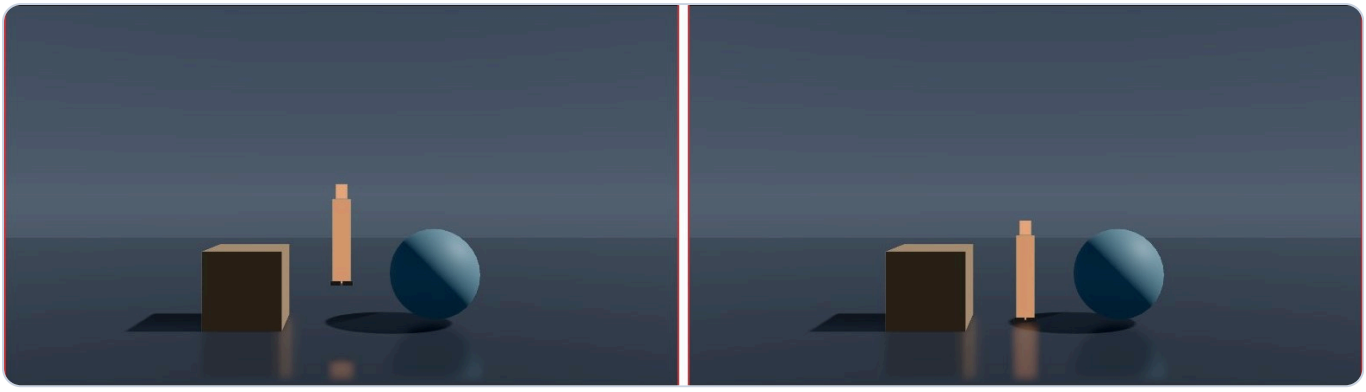
Each value has a lock; locked values turn orange and cannot change by accident. **Lock all** freezes a talent for the show. **Move in picture** under the switcher lets you drag the person on the floor in the Program picture: `Shift`+drag moves up and down, `Alt`+drag turns, the wheel changes the size.



Every value has a lock.

07

Shadow and reflection



Before and after AI assist: the feet stand on the floor, with a shadow towards the key light, a contact shadow and a reflection starting at the soles.

Select the talent, open **Shadow and reflection** and press ✦ **AI assist: perfect shadow and reflection**. It reads the person's matte (where the feet are), the set's lights (where the key light comes from) and the floor under the feet (how glossy it is), sets everything below and tells you why.

SETTING	WHAT IT DOES
Lock the feet to the floor	Finds the feet in the picture and stands them on the floor, even if the camera frame has empty space under them.
Shadow shape	**Camera**: the card's own shadow (light near the camera). **Key light**: the shadow is cast from a hidden copy turned to the light, so a side light still throws a full-body shadow.
Contact shadow	The soft dark patch under the feet. It grounds people even where no light casts shadows.
Reflection, blur, fade	A mirror image on glossy floors that fades with height. Floors with their own planar reflections already reflect people, so AI assist leaves it off there.

> Give the set's main light **Cast shadows** and keep **Shadows** on under Look and speed. In a 360 world the 360 sun casts the shadows (section 11).

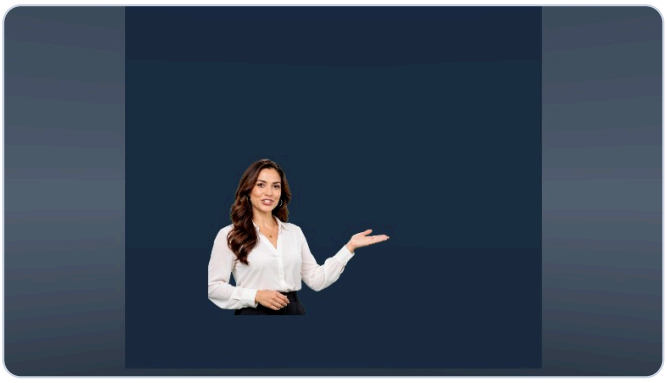
08

Matte objects NEW

Matte objects are **invisible shapes** that decide what is in front of what. You place them in the studio like furniture: a box, a cylinder or a flat card. They never show on air; they only change what the camera sees around them. This is how a presenter walks behind a car that only exists in the background video, or how a real desk in your studio stays in front of the virtual set.



Without a matte: the presenter stands in the set.



A virtual wall in front of her, and a real-foreground shape: inside the shape the camera picture wins.

Holdout

Whatever is **behind** the shape is not drawn. Choose what it hides:

- **Everything:** the people and the 3D set behind it disappear, and the background shows through (the video input, the 360 world or the sky). Use it to match objects that are part of the background picture: a car, a column, a wall, a mountain in a 360 photo.
- **Only the talents:** the 3D set stays, only the people behind the shape are cut. Use it to hide a person's legs behind a counter that is in the set, or anything the set should cover.

A person standing **in front** of the shape stays in front: in or out is decided by distance, every frame. With Depth keying, or with Stand in the set at their real place, people walk around a holdout naturally.

Real foreground

For a **real object in the studio**: a real desk, a podium, a pillar, a product on a table. Inside the shape's outline the camera picture is drawn over the virtual set, so virtual objects can never cover the real desk.

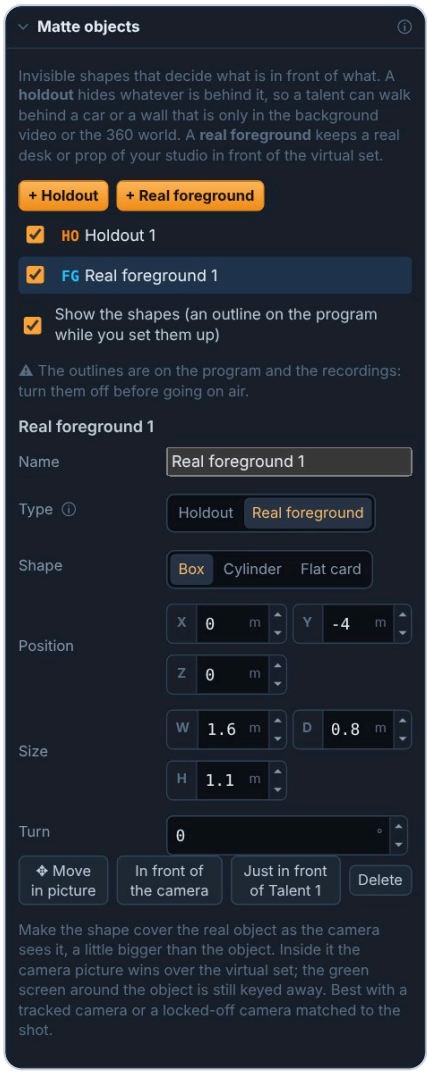
The green screen around the object is still keyed away; only the solid parts of the camera picture (the desk, the presenter's hands on it) come to the front.

Make the shape cover the real object as the camera sees it, a little bigger than the object. Best with a tracked camera or a locked-off camera matched to the shot, because the shape stays where the real object stands in the studio.

Step by step

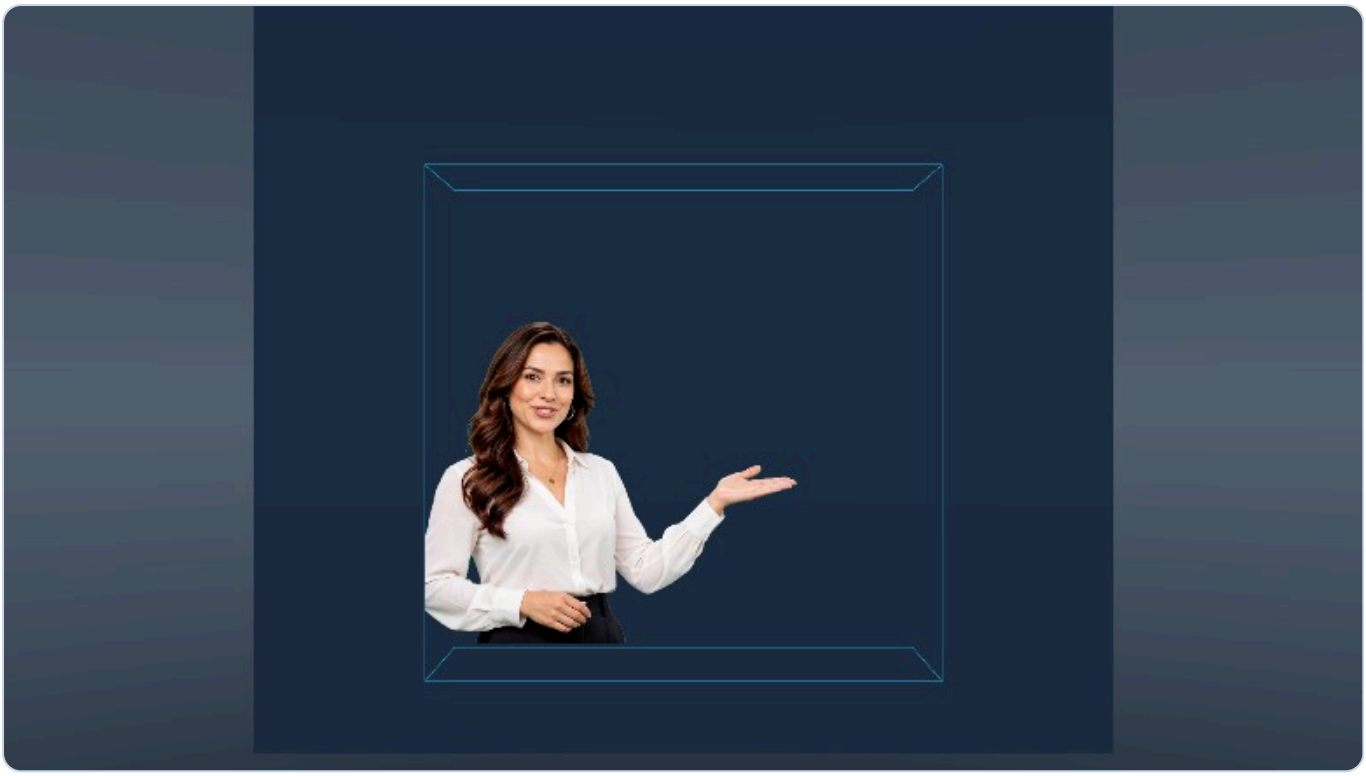
1. On the left, open **Matte objects**.
2. Press **+ Holdout** or **+ Real foreground**. The new shape is placed on the floor about 2.5 m in front of the camera, desk sized, and its outline shows (orange for a holdout, blue for a real foreground).
3. Choose the **Shape**: Box, Cylinder or Flat card. For a holdout choose what it **Hides**.

4. Type its **Position** (the middle of its base, in metres), **Size** (width, depth, height) and **Turn**, or press **✥ Move in picture** and drag it on the floor in the Program picture: `Shift`+drag raises or lowers it, `Alt`+drag turns it, the wheel makes it bigger or smaller.
5. Quick buttons: **In front of the camera**, and **Just in front of** the selected talent.
6. **From an object:** press **+ Holdout from an object** (or **+ Real foreground from an object**) and click any mesh of the set in the Program picture, or select it in **Objects and materials** and press **Use as holdout matte** / **Use as real foreground**. A copy of its **exact shape** becomes the matte: a car, a desk, a sofa, not just a box. It follows the object, and the object itself is hidden so only its shape cuts (untick **Hide the object itself** to see both). Choosing Box, Cylinder or Flat card turns it into a box around the object that you can then move by hand.
7. When it lines up, untick **Show the shapes**. The outlines are drawn on the program while you set up, so turn them off before going on air.



The Matte objects section.

> Each shape has an on / off box in the list, so you can keep several for different shots and switch them as needed. Up to 32 shapes per project. They work on the program, the recordings, NDI, SDI, the fill + key output and every camera of the cluster. Matte shapes live in studio space: moving or scaling the set does not move them, because the real desk did not move either. On the LED wall view they are switched off by themselves.



Setting up a real-foreground shape with its outline showing: the presenter is drawn over the virtual wall only inside the shape.

PART 2

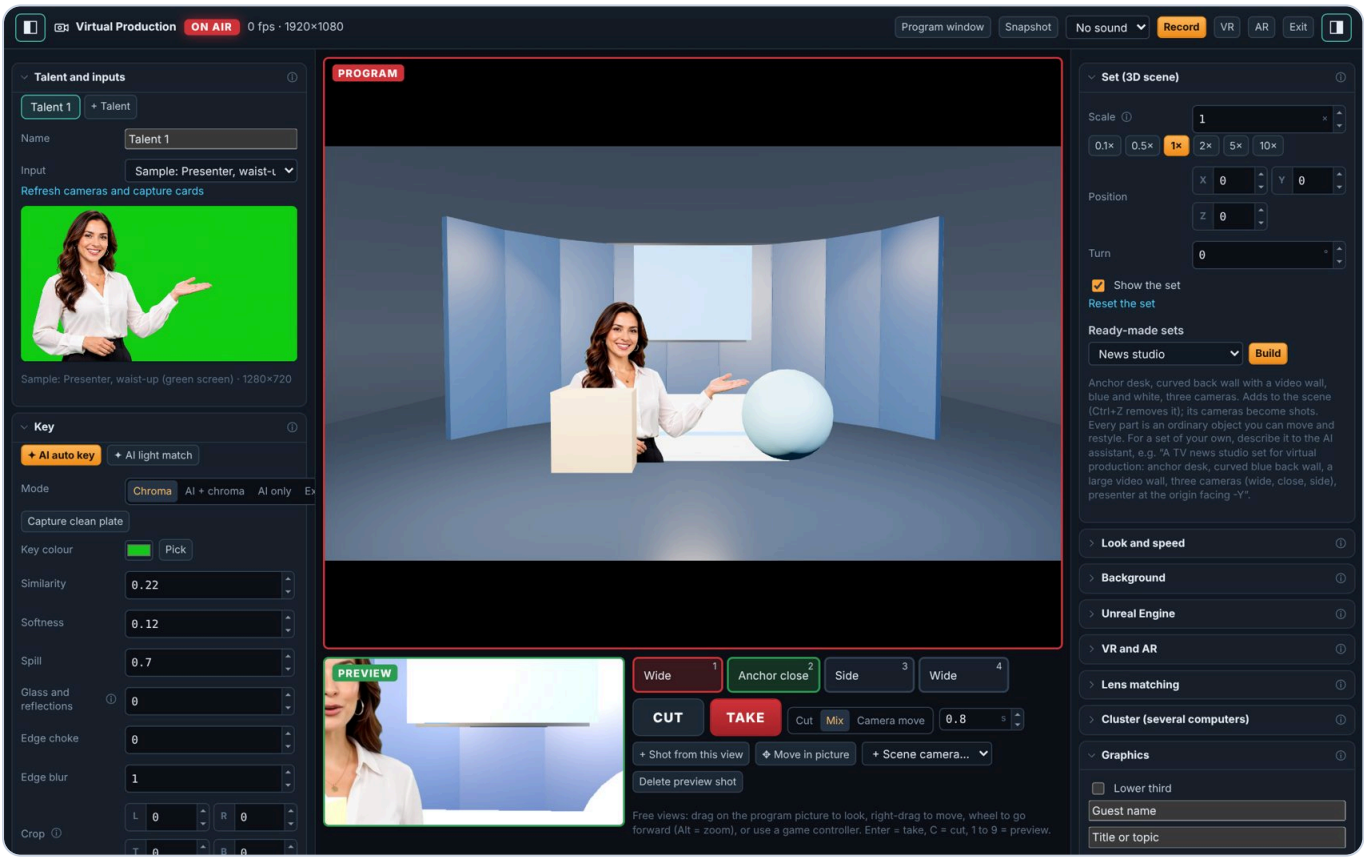
Build the world

The set around your people: your own 3D scene or a ready-made studio, a live video from another engine, or a 360 video of a real place, finished with a cinema-grade post process.

- Sets, objects and set lights
- Background: 3D set or video input
- The 360 world
- Post process
- Look, speed and frame budget
- Film colour and depth of field

09

Sets, objects and set lights



A ready-made News studio built around the presenter, with its camera shots.

Ready-made sets

Under **Set (3D scene)**, choose a template (News studio, Talk show, Sports desk, Classroom, Product launch, Corporate and more) and press **Build**. It is added to your scene (`Ctrl+Z` removes it) and its cameras

become shots. Every part is an ordinary object you can move and restyle. For your own set, model it in the Studio, import GLB, FBX or OBJ, or describe it to the AI assistant.

Move the whole set

Scale makes the set bigger or smaller around the people (1 = real size, with 0.1× to 10× buttons), **Position** and **Turn** move it, **Show the set** hides it. Talents, cameras and matte shapes stay where they are in the studio.

Objects and materials, without leaving

Open **Objects and materials**. It lists **every object of the set** in a tree, with a search box: click an object in the list (or press **Pick** and click it in the Program picture) and:

- choose another **material** for it from the list; an object with several materials shows one list per material;
- change the material's colour, roughness, metal and glow, live;
- if the material is shared by other objects, press **Give it its own copy** so your change touches only this object.

You can also drag a material swatch onto any object in the Program picture. Drop a video or picture file onto a TV or a wall and it becomes a playing screen (section 25).

A set from Unreal Engine (GLB)

Export the level or the set from Unreal as **.glb** and import it (`Ctrl+O`). Korek brings it in as **editable objects with their own materials**: every actor is an object with its name, and with **One object per material** (on by default) a mesh with several material slots is split into one object per material, so each part can get another material. The images inside the file (base colour, normal, roughness and metal, occlusion, glow) go into the materials. Export without mesh compression (Draco); a compressed file, or one where you want animation and skinning, comes in with **View-only model** as one object that keeps the file exactly as it is.

Set lights

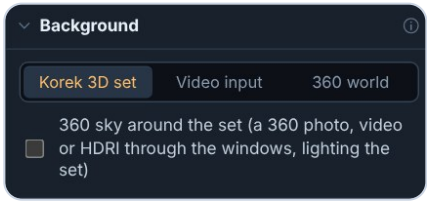
Set lights lists the scene's own lights: tick **On** to switch each one on or off, change its intensity and colour, or press **All on** / **All off**. **+ Point**, **+ Spot** and **+ Soft panel** add a new light aimed at the presenter, without leaving Virtual Production. Changes are saved with the project; lighting cues and shot triggers (sections 25 and 26) play on top of them during the show.

10

Background: 3D set or video input

Under **Background** choose what is behind the people:

- **Korek 3D set:** your scene, rendered live.
- **Video input:** a picture from another machine, for example Unreal Engine or Aximmetry over NDI, a capture card or a screen, or a video file. Korek keys the talent, switches, adds graphics and records on top. Send the program camera to the other engine (section 37) so both move together.
- **360 world:** a 360 video or photo all around the camera (next section).



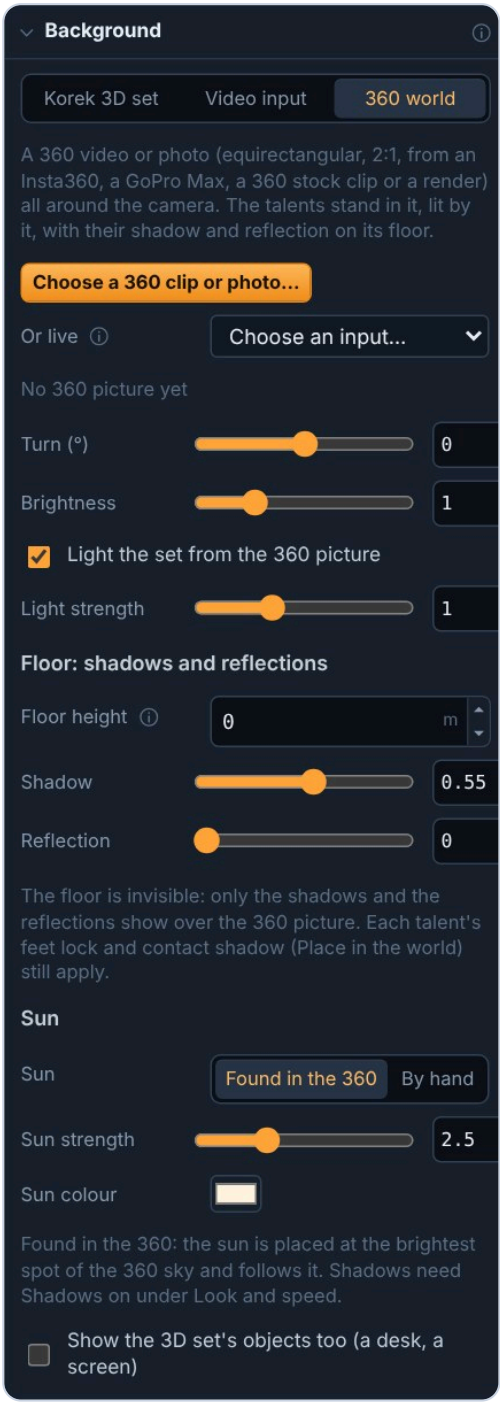
Background: the 3D set, a video input or a 360 world.

11

The 360 world NEW

Put your talent inside a **real place**: a 360 video or photo from an Insta360, a GoPro Max, a stock 360 clip or a 3D render, all around the camera. This is what other systems call a 360 video plate. Korek goes further than a flat backdrop: the picture lights the people, a sun casts their shadows, and an invisible floor shows their shadow and their reflection on the 360 ground.

1. Open **Background** and choose **360 world**.
2. Press **Choose a 360 clip or photo…** The file must be equirectangular (2:1), for example 5760 × 2880. MP4, MOV, WebM, JPG, PNG and WebP work. It is stored in the project. Or choose **Or live**: a live 360 camera in equirectangular mode as a webcam or capture input.
3. **Turn** the picture until the view you want is in front of the camera; set its **Brightness**.
4. Leave **Light the set from the 360 picture** on: the people and any set pieces are lit by the picture itself, refreshed as the video plays. **Light strength** sets how much.
5. Set the **Floor height** until the feet sit on the 360 ground (0 = the studio floor).
6. Raise **Shadow** and **Reflection**. The floor is invisible: only the shadows and the reflections show over the 360 picture.
7. **Sun: Found in the 360** places the sun at the brightest spot of the 360 sky and follows it; **By hand** lets you set its direction and height. Set its strength and colour.
8. Tick **Show the 3D set's objects too** to keep a desk or a screen of your set in the 360 world.



Background: 360 world.

> **Combine it with holdouts.** A 360 street has cars, lamp posts and walls. Put a holdout (Hides: everything) where a car is in the 360 picture, and your presenter walks behind the car. Each talent's feet lock and contact shadow still apply. Shadows need **Shadows** on under Look and speed.

New: rotate, sun and soft shadows

Rotate the view turns the 360 picture around you, like turning on the spot, to choose what is behind the people; the horizon stays level. A 360 **video** now plays as the world, not only a photo. **Sun direction** turns the shadows round the people and **Sun height** makes them shorter or longer; moving either places the sun

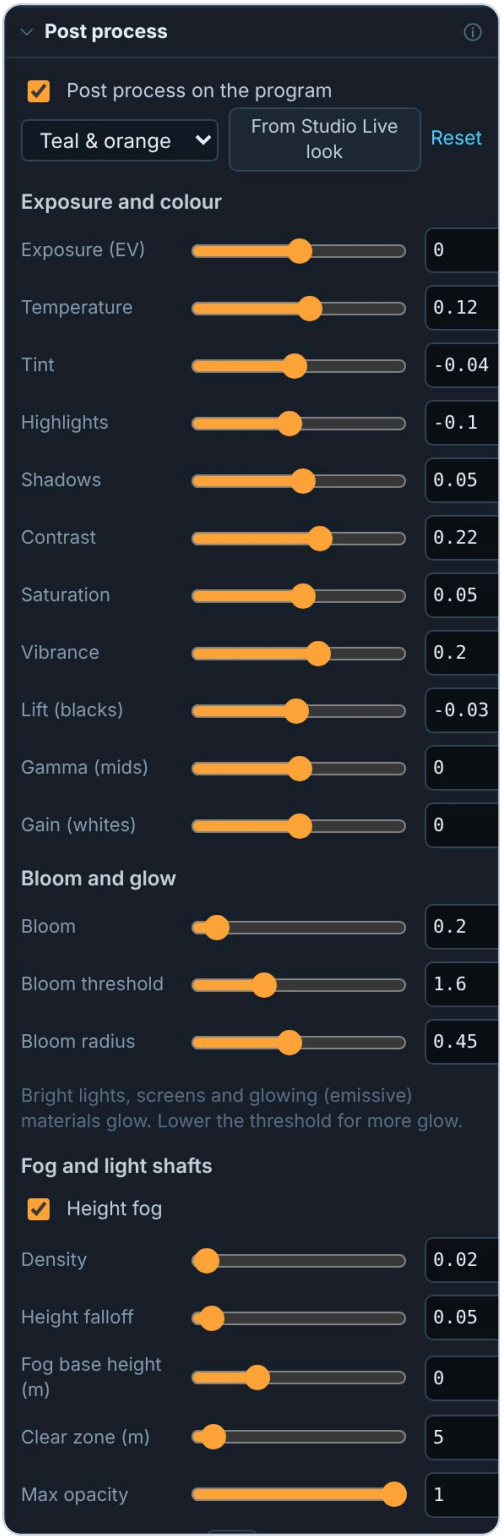
by hand. **Shadow softness** blurs the shadow's edge. The shadow floor now follows the people, so long shadows are not cut off, and **Reflection** mirrors the people in the 360 floor.

12

Post process NEW

The finishing pass on the whole program picture, like a post process volume in a game engine: exposure and colour grade, bloom and glow, height fog with sun glow and light shafts, lens effects and contact shadows. It runs in real time on the program, the recordings, NDI and SDI.

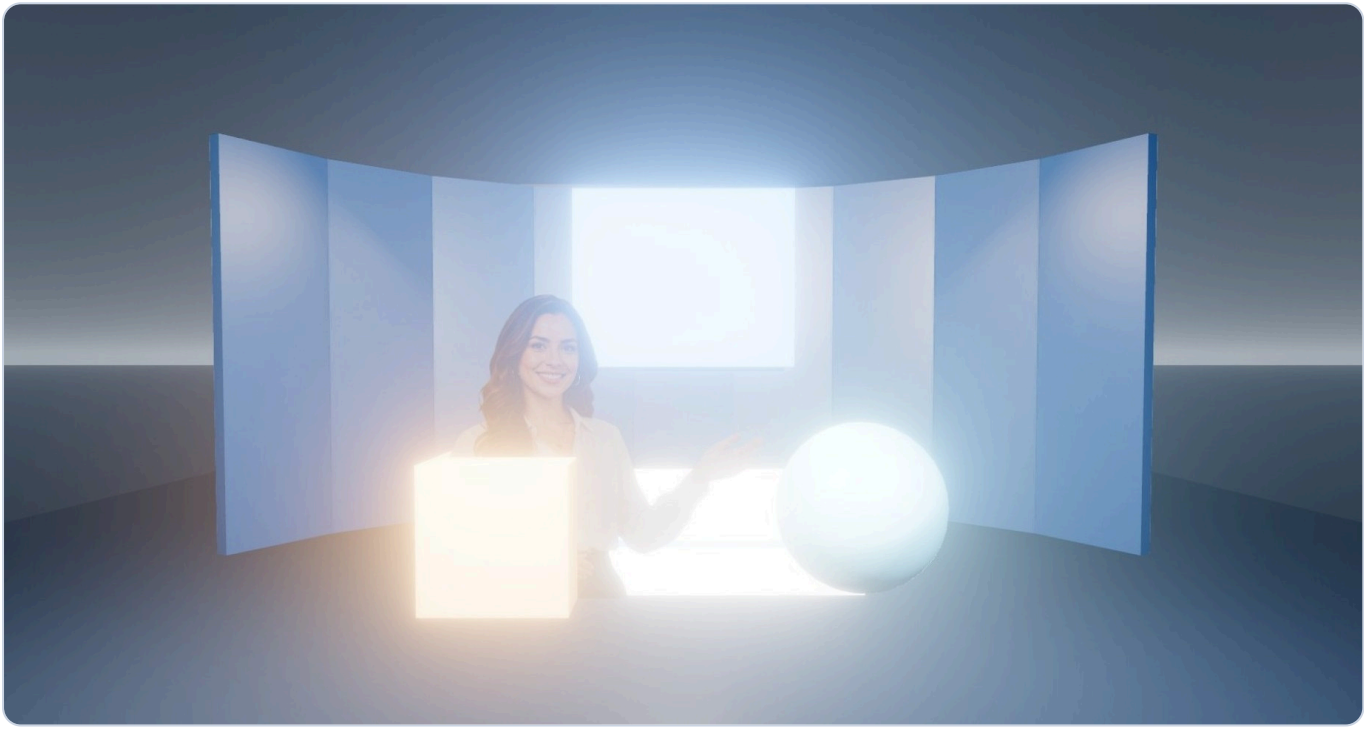
1. Open **Post process** and tick **Post process on the program**.
2. Pick a **look** to start from, or press **From Studio Live look** to copy the fog and film look you made in the Studio's live view. **Reset** clears it.
3. Fine-tune any group below. Everything is live.



Post process.

GROUP	SETTINGS

Exposure and colour	Exposure (EV), temperature, tint, highlights, shadows, contrast, saturation, vibrance, lift (blacks), gamma (mids), gain (whites).
Bloom and glow	Bloom, threshold and radius. Bright lights, screens and glowing materials glow; lower the threshold for more glow.
Fog and light shafts	Height fog with density, height falloff, base height, clear zone, max opacity and colour; sun glow and its colour; light shafts (god rays) and their strength. They come from the set's strongest sun light.
Lens	Vignette, chromatic aberration, film grain, sharpen.
Contact shadows	Ambient occlusion (AO) and its strength: soft shadows where objects meet.



The news set with a post process look and height fog.

Global illumination (bounce light)

Open **Global illumination (bounce light)** and tick it. Light now bounces off the set in real time, like Lumen in Unreal Engine: a sunlit floor lights the ceiling, a red wall tints the floor next to it, and a room is lit by what really comes in through its windows. It has no grain or noise, because it is read from a grid of light probes rather than from random rays.

SETTING	WHAT IT DOES
GI strength · Bounce	How much bounce light there is, and how much of it bounces again.
Probe density	Low, Medium, High or Ultra: more probes give finer bounce light and fewer leaks, and cost more.
Shadowed sky light	The sky only lights what can see it: right for interiors.
Smoothness	Each refresh blends with the last one, so the bounce light changes softly when lights move or cues fade: no flicker.
Leak fix	Stops light creeping through thin walls and into corners.
Capture detail	16 to 48: higher catches small lamps and thin objects in the bounce.
Update speed	How many probes refresh each frame: faster follows changes sooner, slower keeps the frame rate.

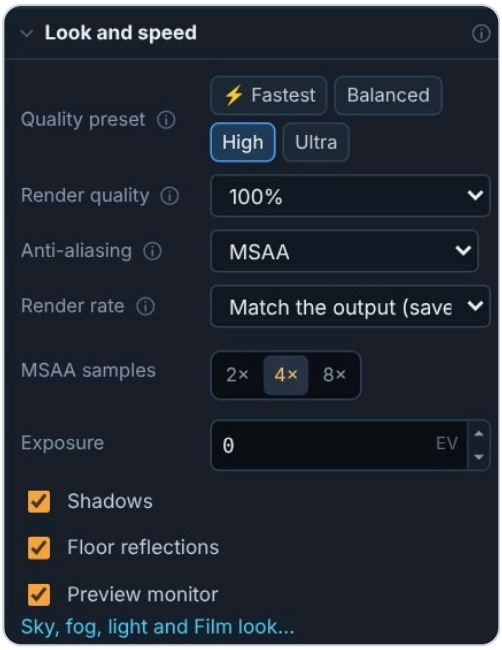
The line under the settings shows the probe grid and **live** once the first pass is done. The same Radiance GI, with the same settings, is in the Studio's Live panel (`Shift+F8`).

13

Look, speed and the frame budget

Look and speed keeps the show smooth:

- **Render quality** 200%, 150%, 100%, 75%, 50% or 35%. Lower is faster. Above 100% the picture is rendered bigger and scaled down (supersampling): the cleanest edges and finest detail. The output size stays the same.
- **Anti-aliasing** (smooth edges): **MSAA + SMAA** (best), **MSAA** with 2×, 4× or 8× samples (smooths the edges of objects), **SMAA** (smooths every edge of the finished picture, including textures, thin lines and the keyed people), **FXAA** (fastest) or Off. For the cleanest picture use MSAA + SMAA with Render quality 150% or 200%, if the frame budget allows. SMAA and FXAA apply to the program, the recordings, NDI and the stream; the 10-bit master for SDI and ProRes keeps MSAA and supersampling.
- **Exposure** of the set, **Shadows**, **Floor reflections**, **Preview monitor**.
- **Frame budget:** a meter of the time one program frame takes against the time allowed at your frame rate. Green is fine, orange is close, red is over. **Show the heaviest objects** lists the objects with the most triangles, so you know what to simplify.

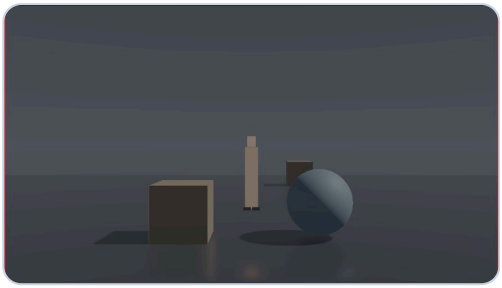


Look and speed: quality and the frame budget.

14

Film colour and depth of field

Film colour (log, HDR, ACES)



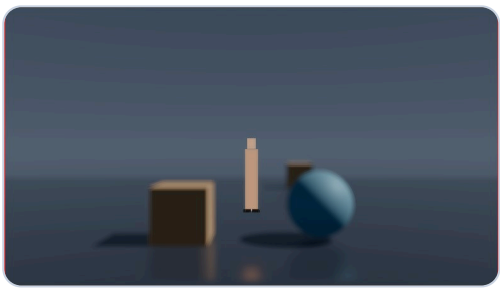
An ARRI LogC3 master with a Rec.709 monitor.

Tick **Film pipeline on**: the engine renders in 16-bit linear light and encodes the picture once at the end, the way the production needs it.

- **Master:** Rec.709 (sRGB or BT.1886), HDR (HLG or PQ in Rec.2020), ACEScct, or a camera log: ARRI LogC3 and LogC4, Sony S-Log3, Blackmagic Film Gen 5, DaVinci Intermediate.
- **Monitor:** Rec.709 shows a normal picture on screen; Master shows the master itself.
- **Camera colour** of each talent decodes the camera's own curve, so people and set share the same light.
- **Graphics on the master** off gives a clean master for post.

A log master cuts and grades together with the camera's own footage in DaVinci Resolve, Baselight or Nuke.

Depth of field



Focus at 1.2 m, T1.4.

Tick **Depth of field**: the virtual set blurs in front of and behind the focus distance exactly as much as the real lens would. The focal length comes from the camera's zoom.

- **Focus: Talent** follows a person as they walk; **Lens** reads the focus ring from the tracking system DESKTOP; **By hand** uses the distance you type.
- **T-stop** and **Sensor** (Super 35, full frame, ALEXA, URSA and more), and a **maximum blur**.
- **Keep the keyed people as filmed:** leave it on; their own lens already focused them.
- **Lens encoder calibration:** focus on marks at known distances, type each raw value and press **Add point**.

PART 3

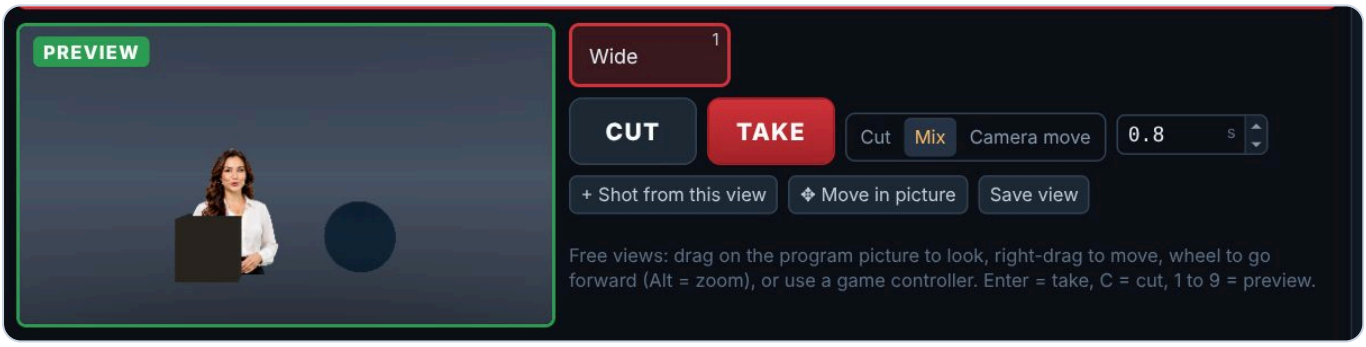
Cameras and tracking

Shots and the switcher, then real camera moves: FreeD tracking from any tracking system or PTZ camera, several tracked cameras and cranes, optical tracking with nothing but printed markers, lens matching and LED walls.

- Shots, switcher, locations
- Camera tracking (FreeD)
- Tracked cameras and cranes
- Optical tracking, lens matching
- LED wall (XR)

15

Shots, switcher and saved locations



Preview, shot buttons, CUT, TAKE and the transition.

Shots

A shot is a camera: a **free view** you saved with **+ Shot from this view**, a **scene camera** from your project (**+ Scene camera…**), or a **tracked camera** that follows a real one. A shot can show only some talents, so a close-up shows only the anchor. Up to 64 shots.

Switching

1. Click a shot or press `1` … `9` to put it in **Preview** (green).
2. **TAKE** (`Enter`) goes to it with the transition: **Mix**, **Cut** or **Camera move** (the virtual camera flies from one shot to the next), over the time you set.
3. **CUT** (`C`) switches at once. Double-click a shot to cut straight to it.

Saved locations

A big set can hold many places: the anchor desk, the weather wall, the interview corner. **Saved locations** stores where you are: the set's position, turn and size together with the camera. Press **Save this location**,

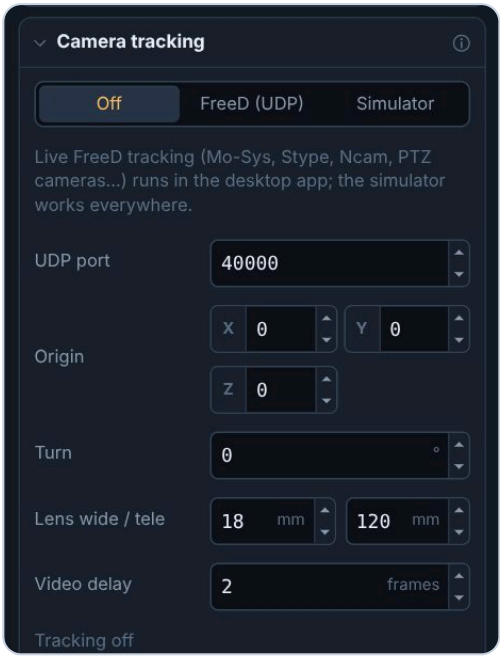
name it, and go back any time with one click; tick **Move the camera smoothly** to fly there over the transition time. Rename, update to here, search and delete them in the list. Up to 500 locations; a rundown item or a macro can go to one.

16

Camera tracking (FreeD) DESKTOP

Tracking moves the virtual camera with the real one, so the set stays locked to the floor when the camera pans, tilts, rolls, zooms or travels. Korek reads **FreeD**, the protocol of most tracking systems (Mo-Sys, Stype, Ncam, TrackMen and others) and of many PTZ cameras (Panasonic, Sony, Canon, BirdDog).

1. Set the tracking system or PTZ camera to send FreeD over UDP to this computer's IP address.
2. Under **Camera tracking** choose **FreeD (UDP)** and enter the same port.
3. Set **Origin** and **Turn** so the tracker's zero matches the set, and the lens range (wide and tele).
4. Measure the **Video delay** so the data and the picture move together (the camera picture usually arrives a few frames after the data).
5. Cut to the **Tracked camera** shot.



Camera tracking.

Simulator moves a pretend camera so you can practise anywhere, with no hardware.

> Tracking also brings **zoom** (the field of view follows the lens) and **focus** (depth of field can read the focus ring, section 14), and the lens distortion follows the zoom (section 18).

17

Tracked cameras and cranes DESKTOP

Each real camera (on a tripod, pedestal, Steadicam or crane) has its own tracking. Under **Tracked cameras and cranes** press **+ Tracked camera** or **+ Crane / jib** and set:

- **FreeD camera ID:** the ID its tracking system sends. All cameras can send to the same port.
- **Its picture:** the camera input(s) that are this camera, so the right person is keyed in the right shot.
- **Stands at** and **Height offset:** where it is in the studio.
- **Lens wide / tele** and the **zoom counts** the tracking sends at full wide and full tele.



Tracked cameras and cranes.

Each one becomes a shot. Switch between them like any shot: a three-camera studio with a crane works like a real gallery.

18

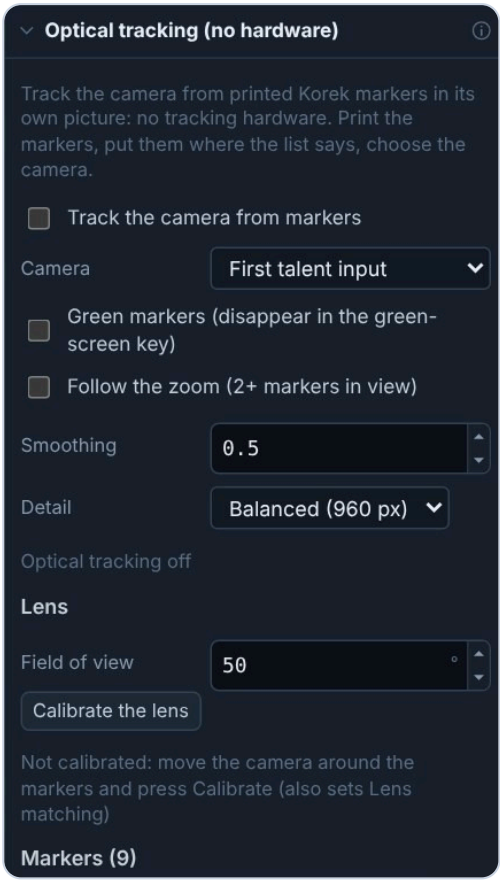
Optical tracking and lens matching

Optical tracking (no hardware)

Track the camera from **printed Korek markers** in its own picture. No tracking system to buy.

1. Choose a **Marker layout** and press **Use layout**, or add markers one by one (**Add marker**): each has a number, a size in cm and a position in metres from the studio origin (floor = Z 0).
2. Press **Print markers…** and put them where the list says. Tick **Green markers** to print them in greens that disappear in the green-screen key.
3. Choose the **Camera** (a talent input), set its field of view, and tick **Track the camera from markers**.
4. **Follow the zoom** works when two or more markers are in view; **Smoothing** goes from raw to very steady; **Detail** is Fast (640 px), Balanced (960 px) or Precise (1280 px).

Best results: markers at different depths (back wall, side walls, floor), three or more in every shot, matte paper, even light. The **Demo camera** lets you try it with no camera at all.



Optical tracking from printed markers, no hardware.

Lens matching

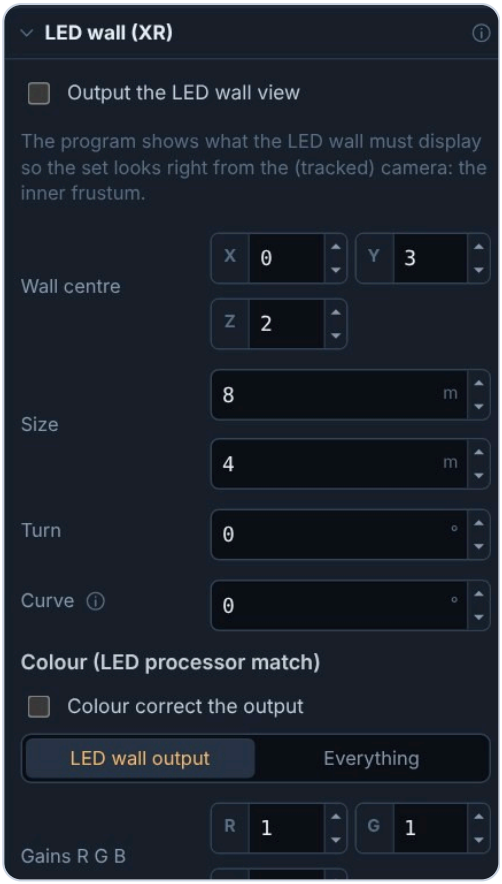
Real lenses bend straight lines a little (barrel or pincushion). The virtual set is a perfect picture, so it would not line up at the edges. **Lens matching** bends the virtual picture the same way: k1 and k2 at the wide end and at the tele end of the zoom, and the optical centre. Turn on the **grid**, point the camera at straight lines near the edge of the picture (a door, a window frame) and change k1 until the grid bends like the real lines. Do it zoomed out and zoomed in; tracking blends between them.

19

LED wall (XR)

On an LED volume the set is shown on the wall behind the people and filmed for real. **LED wall (XR)** renders the set on the wall with the **right perspective from the tracked camera** (off-axis projection), so the background moves correctly as the camera moves.

- Set the wall's **centre**, **width**, **height** and **turn** in studio metres. Talents and matte shapes are switched off on the wall view by themselves: the real people are in front of it.
- **Colour:** gains (R G B) and a **.cube 3D LUT**, applied to the wall output or to the whole program, so the wall seen by the camera matches the set.
- **Moiré check:** enter the LED pixel pitch, the wall distance, the focus distance, the lens and the sensor; Korek warns when the wall's pixel grid would show in the camera.
- A big wall can be split over several computers (section 36). Depth of field is switched off on the wall: the real lens blurs it.



LED wall (XR).

PART 4

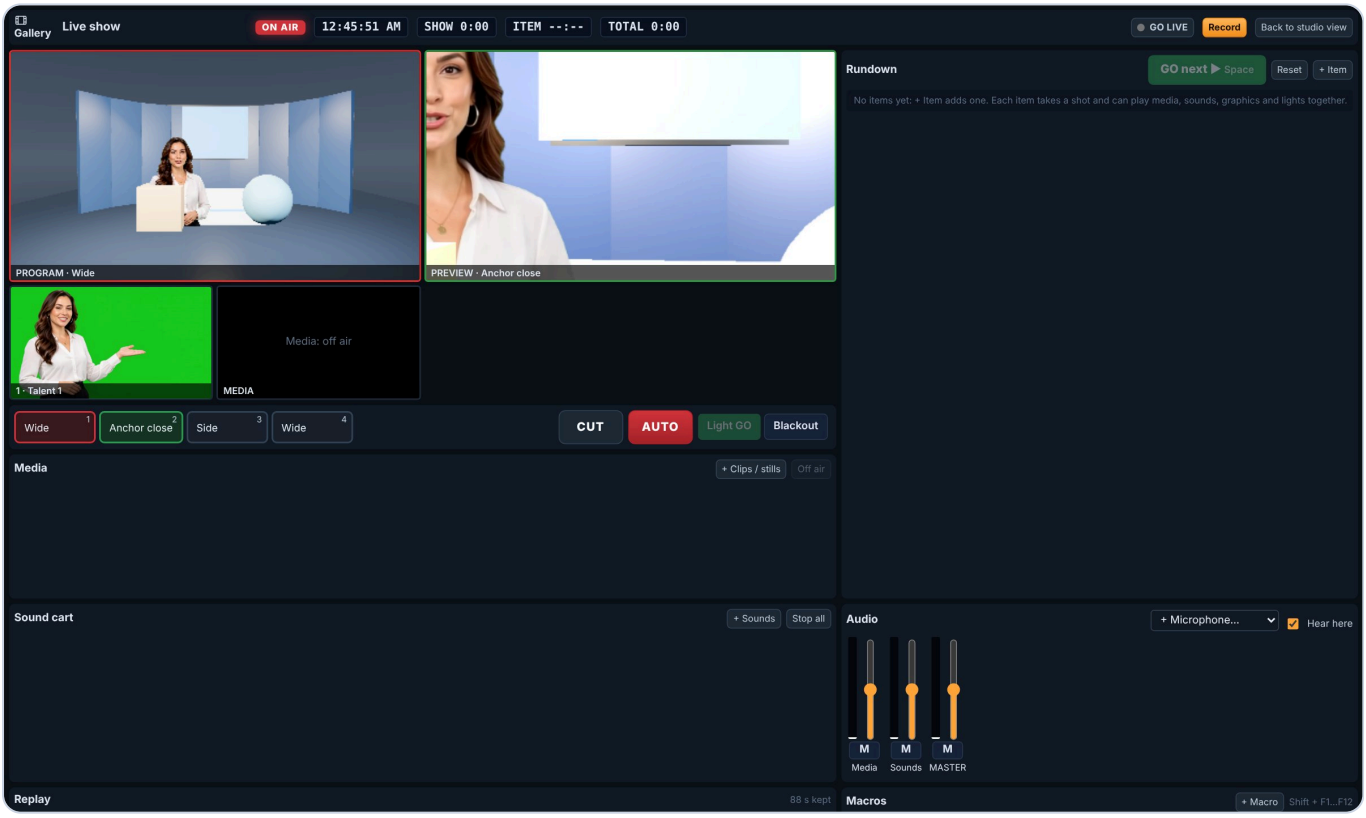
Run the show

The control room on one screen: a multiviewer, the rundown, media to air, a sound cart and audio mixer, macros, instant replay, video screens in the set, lighting cues and graphics.

- The Gallery
- Rundown
- Media, sounds, audio
- Macros
- Instant replay
- Video screens and triggers
- Lighting and DMX
- Graphics and teleprompter

20

The Gallery



The Gallery: multiviewer, switcher, rundown, media, sound cart, audio mixer, replay and macros.

Press **Gallery** in the top bar. It is the control room of a live show, everything one director needs:

AREA	WHAT IT DOES

Clocks	Show name, time of day, show time, time left on the current item, and how late or early you are against the rundown.
Multiviewer	Program, Preview, and the media and camera inputs, with their names.
Switcher	Shots, CUT, AUTO, light GO and Blackout.
Rundown	The running order of the show (next section).
Media	Clips and stills to air, full screen or in a box over the picture.
Sound cart and audio	Jingles and effects on `F1` … `F12`, microphones and the program mix.
Graphics	The lower third, with title and subtitle, on and off.
Replay and macros	Instant replay and one-button sequences (sections 23 and 24).
Show controls	GO LIVE (streaming), Record, back to the studio view.

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Rundown

The rundown is the show's running order. Each **item** has a name, a length in seconds, notes for the crew (script, who speaks, cues) and a list of **actions** that all happen together when it goes.

1. Press **+ Item**, name it and set its length.
2. Under **+ Add to this item…** add what should happen: take a shot (cut or with the transition), put media on air or off, play a sound, set the lower third, fire a lighting cue or blackout, play a clip on a screen of the set, go to a saved location, start a replay, start or stop the stream, start or stop recording, run a macro, or send a RossTalk command.
3. On air, press **GO next** ▶ or `Space`: the next item runs. **Run now** fires any item directly.
4. The clocks count the item down and show if you are late (+) or early (−). **Reset** starts over.

> Build the rundown in rehearsal and the show becomes a series of `Space` presses: shot, titles, music, lights and screens in perfect sync, every time.

22

Media, sound cart and audio mixer

Media to air

+ Clips / stills adds video files and pictures to the project. Each one goes to air **Full screen** or in a **box** over the picture, with loop, sound and a fade. One click puts it on air; **Off air** takes it away. MEDIA ON AIR shows in the gallery while it plays.

Sound cart

+ Sounds adds jingles, stings, applause and effects. The first twelve play on `F1` … `F12`; each has a gain, a loop and a colour. **Stop all** (or `Esc`) stops them.

Audio mixer

The mixer makes the **program sound**: the master goes into recordings and the stream. **+ Microphone…** adds any sound input of the computer (a USB mic, an audio interface, the camera's sound), each with a fader and mute; guests get their own faders. Microphones are not played on the speakers (no feedback); **Hear here** lets you listen on headphones.

23

Macros NEW

A macro runs **several things with one button**, in order, with waits between them: the opening of a show, a goal sequence, a break, the end credits.

1. In the Gallery, press **+ Macro**. Name it and give it a colour.
2. Add steps, the same actions as the rundown plus **WAIT** (seconds), another **MACRO**, **REPLAY**, **STREAM**, **RECORD** and **ROSSTALK**. Move steps up and down; remove the ones you don't need.
3. Run it with its button, or `Shift+F1` … `Shift+F12` for the first twelve. Right-click a macro to edit it.

Example, "Opening": lights to cue 1 · play the jingle · WAIT 2 s · take the Wide shot with a camera move · WAIT 3 s · lower third "Evening News" · start recording · GO LIVE.

Macros also run from the remote control and the HTTP API (`/api/macro?macro=Opening`), from RossTalk (`CC 1:n` , `GPI n`) and from a Stream Deck through Bitfocus Companion.

24

Instant replay NEW

Korek keeps the **last minutes of the program**, and of any camera input you choose, all the time, compressed by the computer's own video encoder. Play any moment back on air, at full speed or in slow motion, with a REPLAY mark on screen.

1. In the Gallery's **Replay** panel, choose the **source**: the program, or a camera input.
2. Choose the **speed**: full speed, slow 50%, 33% or 25%.
3. Press **Last 5 s**, **Last 8 s**, **Last 12 s** or **Last 20 s**: the replay goes to air at once. **Off air** ends it.
4. Press **MARK** to keep the last 10 seconds for later; marked moments stay in a list for the rest of the show, ready to play.

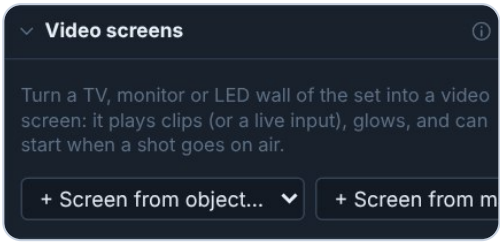
Under **Recorded for replay** choose how much is kept (30 s, 60 s, 2 min or 5 min) and which camera inputs are recorded as well as the program (each input uses more of the computer, up to 8).

> Replays work in the desktop app and in Chrome or Edge. Macros, the rundown, RossTalk and the API can start them: `/api/replay?action=last&seconds=8&speed=0.5` .

25

Video screens and shot triggers

Video screens



Video screens.

Turn a TV, a monitor or an LED wall of the set into a **video screen**: it plays clips, a still or a live input, and glows, lighting the set a little.

1. **Quickest:** drag a video or picture file from your computer (the desktop, a folder) and drop it on any object in the Program picture. While you drag, the object under the mouse is outlined and a label says "Play on …". It plays at once; drop more files to add clips, hold `Alt` while dropping to replace them. On an object with several materials (a TV with a frame and a glass), only the part you drop on becomes the screen. Or press **+ Screen from object…** / **+ Screen from material…**.
2. **+ Add clips** (MP4, MOV, WebM, pictures), or choose **Input** for a live camera, a guest or a screen.
3. **At the end of a clip:** Loop, Next, Hold (keep the last frame) or Stop (the screen goes dark).
4. **Brightness** (1 is a TV in a lit room, LED walls 2 to 4), the clip's sound and its volume, and **Start playing when Virtual Production opens**.

Each screen has play, pause, stop, restart, previous and next, and a list of clips to jump to. The picture keeps the video's own colours (a red slide stays red), and glows into the set.

Shot triggers

A shot trigger is something that happens **by itself every time a shot goes on air** (TAKE or CUT). You set it up once, and the show runs it for you.

1. Open **Shot triggers** and choose the **Shot** (the shot in Preview is chosen for you).
2. Press **+ Add a trigger…** and choose what happens: **Switch a light** on or off (with its level and a fade in seconds), a **Lighting cue** (a whole look of every light, section 26), a **Video screen** (play from the start, next clip…), or **Every light**: blackout and back.
3. Press **Try it now** to see the triggers without switching shots, and **Reset the lights** to undo the test.
4. TAKE the shot: the triggers run.

Example: for the "Anchor close" shot, add "Key light: on at 120%, fade 1 s" and "Back wall: off". For the "Wide" shot add "Back wall: on" and "Screen: play from start". Now switching between the two shots also changes the lighting and plays the wall clip, every time.

26

Lighting cues and the DMX console

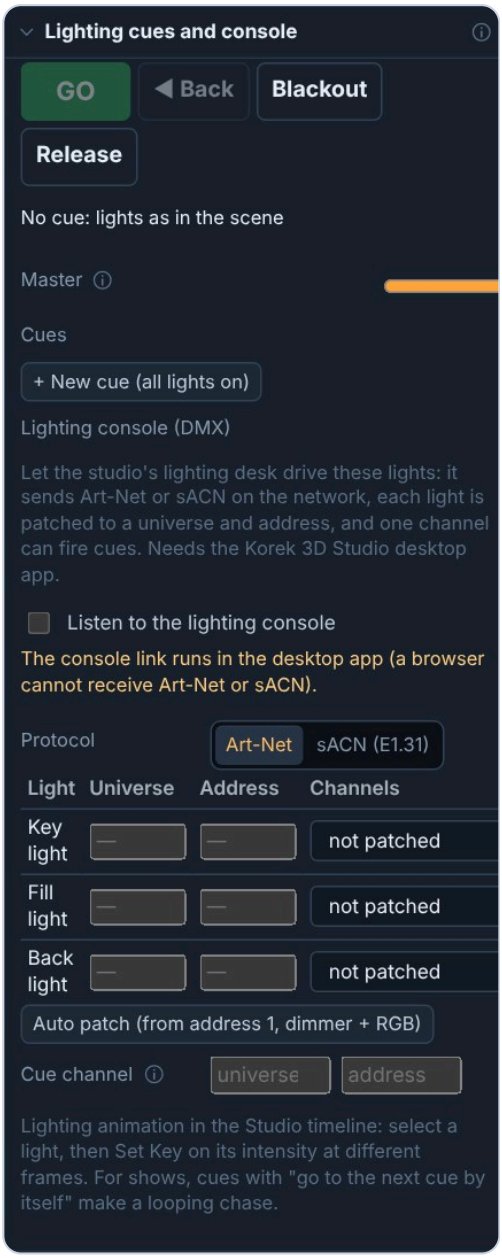
Like a lighting console for the lights of your set. Each **cue** stores, for every light, on or off, a level (0 to 2 times its own intensity) and a colour. Press **GO** (`G`) and the lights fade to the next cue over its fade time.

- **Follow:** a cue can go to the next one by itself after some seconds, for animations and chases.

- **Effects** per light: Pulse breathes, Strobe flashes, Flicker is a fire or a faulty tube, Colour cycle runs through the colours, with a speed.
- **Back**, **Blackout** (B, again to come back), **Release** (every light back to the scene) and a **Master**.

Lighting console (DMX) DESKTOP

Let the studio's real lighting desk drive the virtual lights. Choose **Art-Net** or **sACN**, patch each light to a universe and address (1 channel dimmer, 3 channels RGB, or 4 channels dimmer + RGB), or press **Auto patch**. A **cue channel** lets the console fire cue N by setting that channel to N.



Lighting cues and console.

27

Graphics, live data and teleprompter

- **Lower third:** name and title, with an accent colour.
- **Logo:** any picture, in a corner, at the size you want.
- **Clock**, a **LIVE** bug and a **news ticker** with its speed.
- **Scoreboard:** teams, scores, clock, period and team colours.
- **Information box:** a title and lines (results, polls), in a corner.
- **Live data:** a JSON or CSV address read every few seconds; its values fill `{{name}}` in any graphic (results, prices, weather). The API can set values too: `/api/vars?home.score=3`.



Graphics.

Talent view and teleprompter

Opens a screen for the presenter: they see themselves in the set (mirrored if you like) with the **script** scrolling over it. Set the speed, the font size, mirrored text for a beam-splitter prompter, a safe area, reading marks and the reading band. `Space` in the talent view starts and stops the prompter; the remote and the API control it too.

PART 5

Go live

Stream the program to every platform at once, bring in guests from their phones, light up the tally on every camera, and let Ross switchers, Stream Decks and newsroom scripts drive the show. All free, all from the desktop app.

- Live streaming
- Guests on the studio Wi-Fi
- Tally lights
- RossTalk
- Remote control and HTTP API

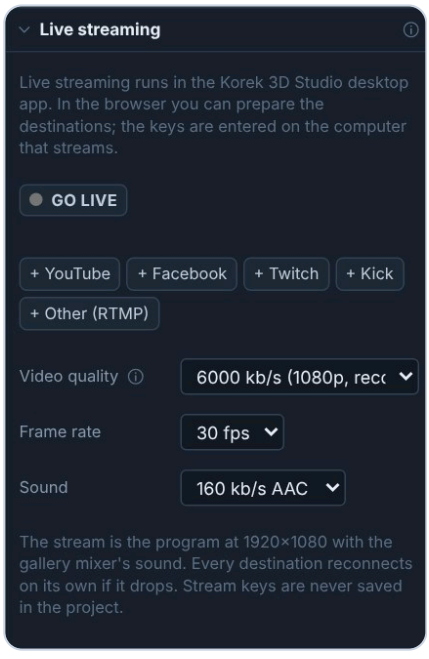
28

Live streaming NEW DESKTOP

Korek streams the finished program, with graphics and the gallery mixer's sound, straight to **YouTube, Facebook, Twitch, Kick** and any **RTMP or RTMPS** server (Instagram, LinkedIn, TikTok, Vimeo, Restream or your own server), up to 8 destinations at the same time. No extra streaming software and no streaming fees.

Set up once

1. Open **Live streaming** and press **+ YouTube**, **+ Facebook**, **+ Twitch**, **+ Kick** or **+ Other (RTMP)**. The server address is filled in for you (for Kick and Other, paste the server address the platform gives you).
2. Get the **stream key** from the platform (where to find it is written under each destination), paste it and press **Save**.
3. Choose the **Video quality**, the **Frame rate** (25, 30, 50 or 60 fps) and the **Sound** (96 to 256 kb/s AAC).
4. Tick the destinations to use for this show.



Live streaming.

PLATFORM	WHERE THE STREAM KEY IS
YouTube	YouTube Studio → Create → Go live → Stream: copy the stream key.
Facebook	Facebook → Live video → Streaming software: copy the stream key (RTMPS).

Twitch	Creator Dashboard → Settings → Stream: copy the primary stream key.
Kick	Creator dashboard → Settings → Stream URL and key: paste the URL as the server, then the key.
Other	Paste the server address (rtmp:// or rtmps://) and the key from your platform or server.

Go live

1. Press **GO LIVE** in the top bar (or in the Gallery, the rundown, a macro, the remote or the API).
2. Each destination shows **Connecting**, then **Live** with its speed and time. The health light next to the button shows what goes out (kb/s) and any dropped data.
3. If the internet drops, each destination shows **Reconnecting** and comes back on its own.
4. Press **END STREAM** (it shows how long you have been live) and confirm.

VIDEO QUALITY	USE IT FOR
2500 kb/s	720p, slow internet.
4500 kb/s	1080p on a modest connection.
6000 kb/s	1080p, recommended. Facebook and Twitch accept up to about 6000.
8000 to 12000 kb/s	1080p50/60 or more detail on YouTube (4500 to 9000 for 1080p).

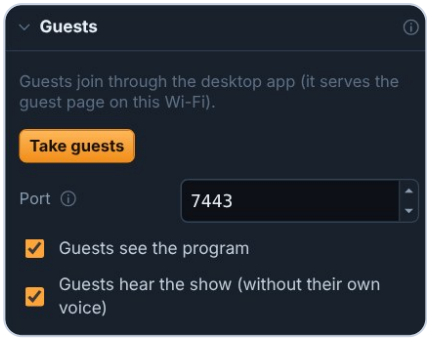
Upload speed. Your internet upload must be about 1.5 times the total of all destinations: three destinations at 6000 kb/s need about 27 Mb/s up. Use a cable, not Wi-Fi, for important shows.

Stream keys are safe. They are encrypted and kept on the computer that streams, never in the project file, so you can share a project without sharing your keys. **Forget** removes a key. In the browser you can prepare the destinations; keys are entered in the desktop app.

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Guests on the studio Wi-Fi NEW DESKTOP

Up to **8 guests** join the show from a phone, tablet or laptop on the same Wi-Fi as the studio computer. No app to install, no account, no cloud service: the desktop app serves the guest page itself, and the call goes straight between the guest's browser and Korek.



Guests.

1. Open **Guests** and press **Take guests**.
2. Each guest place has a **link** and a **QR code**. Let the guest scan it or send them the link (**Copy link**).
3. The first time, the guest's browser says the connection is not private: they tap **Advanced**, then **Proceed**. The page uses this computer's own certificate.
4. On the guest page they type their name, choose their camera and microphone, check the preview and press **Join the show**. They can mute the microphone and turn the camera off.
5. In Korek the guest appears in their place. **Put in the show** makes them a talent. A guest can also be the input of a video screen in the set (a "video wall" interview) or the background. **End call** ends it.

- **Guests see the program:** the finished show comes back to their screen.
- **Guests hear the show (without their own voice):** a mix-minus, so they hear the presenter and the other guests without an echo of themselves.
- Their microphone becomes a fader in the Gallery's audio mixer. When they are on the program, their page shows an **ON AIR** light.
- **New links** makes fresh links (the old ones stop working; guests already in a call stay). The **port** is 7443 unless you change it; choose the **network** if the computer has more than one.

> Guests must be on the same network as the studio computer. Key a guest in front of a green cloth, or use the AI matte to cut them out of their living room.

30

Tally lights NEW

Tally tells the camera operators and the presenter which camera is **on air (red)** and which is **next (green)**.

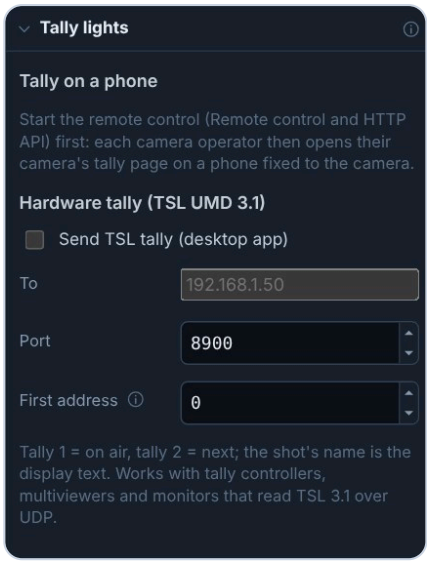
Tally on a phone DESKTOP

Start the **Remote control** (section 32). Under **Tally lights** each shot has a link and a QR code: the operator opens it on a phone fixed to their camera. The whole screen turns red when that shot is on air and green when it is in preview, with the shot's name.

Hardware tally (TSL UMD 3.1) DESKTOP

Tick **Hardware tally** and enter the **TSL address** and **port** of your tally controller, multiviewer or monitor that reads TSL 3.1 over UDP (port 8900 unless set otherwise). Shot 1 is display address 1 (plus the **First address** offset), shot 2 is address 2, and so on. Tally 1 is on air, tally 2 is next, and the shot's name is the display text.

Guests get their own ON AIR light on their guest page.



Tally lights.

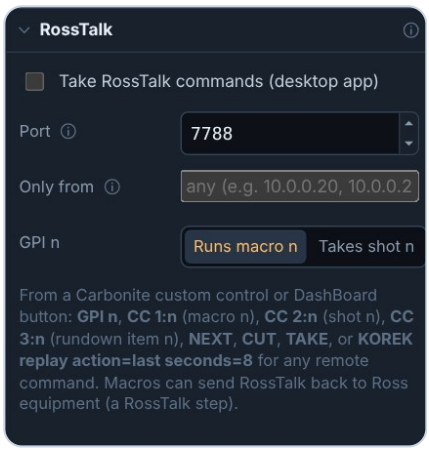
31

RossTalk NEW DESKTOP

RossTalk is the plain-text command language of Ross switchers (Carbonite, Acuity, Ultrix), DashBoard panels and XPression. Korek understands it both ways.

Ross drives Korek

Turn RossTalk on; Korek listens on port **7788** (change it if needed). **Only from** limits it to the addresses of your Ross equipment. Then send from a Carbonite custom control or a DashBoard button:



RossTalk.

ROSSTALK	KOREK DOES
`GPI n`	Runs macro n (or takes shot n, as you choose).
`CC 1:n`	Runs macro n.
`CC 2:n`	Takes shot n.
`CC 3:n`	Runs rundown item n.
`NEXT or GO`	GO next item of the rundown.
`CUT or MECUT 1`	Cuts to the preview.
`TAKE, AUTO or MEAUTO 1`	Takes the preview with its transition.
`KOREK replay action=last seconds=8`	Any remote command (as in section 32).

Korek drives Ross

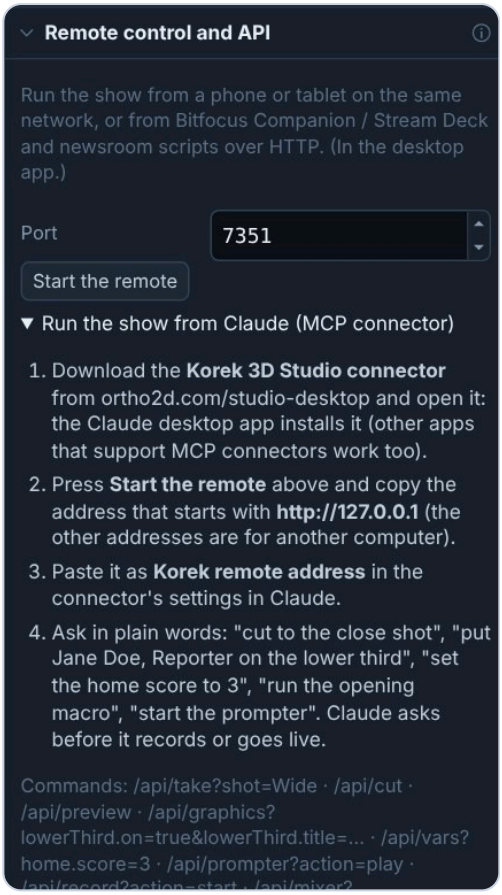
A **RossTalk** step in a macro or a rundown item sends a command to a Ross device: its address, its port and the text, for example `CC 1:4` to fire a custom control or `MECUT 1` to cut the Carbonite.

32

Remote control and HTTP API DESKTOP

Run the show from a **phone or tablet** on the studio network, or from **Bitfocus Companion and a Stream Deck**, a newsroom system or any script. Open **Remote control and API**, keep the port or change it, and press **Start the remote**. The addresses to open appear under it; the remote page has the shots, CUT and TAKE, graphics, the prompter, record, macros, replay and the stream.

Every API call needs the key shown in Korek: add `?key=…` or the header `X-Korek-Key`.



Remote control and API.

ADDRESS	WHAT IT DOES
`/api/state`	Shots, program and preview, graphics, prompter, recording, values.
`/api/take?shot=Wide`	Take a shot (name, number from 1, or id). Also /api/cut and /api/preview.
`/api/graphics?lowerThird.on=true&lowerThird.title=Jane`	Set any graphic.
`/api/vars?home.score=3`	Values for {{name}} in the graphics.
`/api/prompter?action=play`	play, pause, toggle, top, faster, slower.
`/api/record?action=start`	start, stop.
`/api/stream?action=start`	Go live or end the stream.
`/api/macro?macro=Opening`	Run a macro (name, number or id).
`/api/replay?action=last&seconds=8&speed=0.5`	last, mark, play (&mark=id), stop.
`/api/rundown?action=next`	GO next, or action=goto&item=3.
`/api/media?media=Intro`	Media to air (action=off takes it off).

`/api/sound?sound=Applause`	Play a sound (action=stop).
`/api/screen?screen=1&action=play&clip=2`	play, pause, stop, restart, next, prev.
`/api/light?action=go&cue=Opening`	go, next, back, blackout, restore, release.
`/api/location?location=Desk`	Go to a saved location.
`/?tally=2`	The phone tally page of shot 2.

Commands also go as JSON: `POST /api/command {"cmd": "take", "shot": "Wide"}`.

> **Stream Deck in five minutes.** In Bitfocus Companion add a Generic HTTP connection, make a button with a GET request to `http://studio-pc:port/api/take?shot=Wide&key=…` , and one per shot, macro and replay.

PART 6

Record and send out

Record the program in the browser or as a 10-bit master, control the studio's recorders with timecode, send the program out on SDI with fill and key, share it on NDI, and use several computers together.

- Recording, ProRes and 4K
- Recorders, timecode, camera data
- SDI output, fill + key
- NDI, program window, cluster
- Unreal Engine (Korek Link), VR and AR

33

Recording and pro recording

Record in the top bar saves the program as a video file with the sound you choose next to it (or the Gallery mixer). **Snapshot** saves a still.



Pro recording.



Pro recording: format and folder.

Pro recording: ProRes and DNxHR DESKTOP

- **Format:** Apple ProRes 422 HQ (the usual master), ProRes 4444 (full colour detail for keying and VFX) or Avid DNxHR HQX.
- **Save to** a folder (default Videos › Korek 3D Studio), with 24-bit PCM sound.
- The file is 10-bit, carries the studio timecode and the master's colour tags; the status shows frames and dropped frames.

Recording in 4K

Under **Output** set 3840 × 2160, then record. 4K needs a strong graphics card and processor, and a fast SSD: ProRes 422 HQ in UHD at 25p takes about 90 GB every 10 minutes.

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Recorders, timecode and camera data DESKTOP

Recorders and timecode: press **+ Ki Pro** (AJA Ki Pro Ultra, Ultra Plus, Ultra 12G, GO, Rack) or **+ HyperDeck** (Blackmagic, with Ethernet) and type its IP address. They start and stop with Korek's Record; choose the unit whose **timecode** is the house timecode. For a Ki Pro group add only the leader.

Camera data (for post) records the program camera's position, direction and lens every frame, with the timecode, and exports Nuke .chan, a glTF camera (Blender, Unreal, Maya, Cinema 4D) and JSON, to finish the shot in post with the same camera.

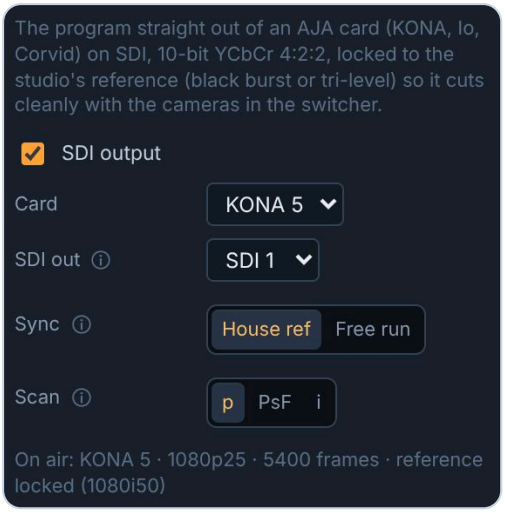


A Ki Pro with its live timecode.

35

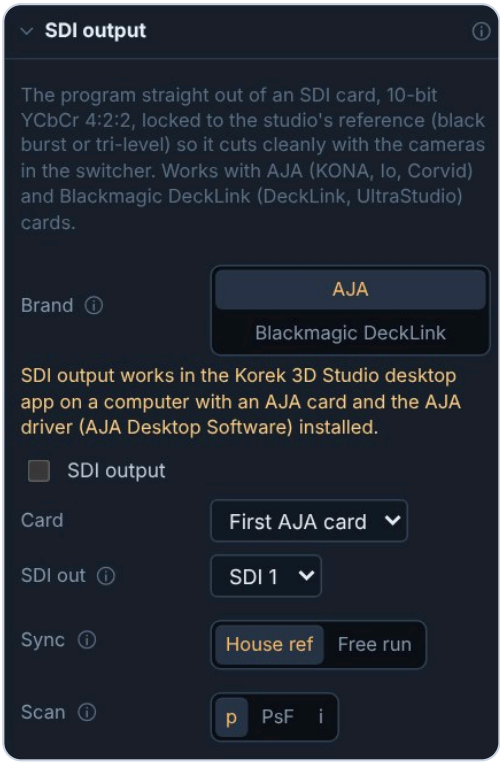
SDI output and fill + key DESKTOP

The program goes straight out of an SDI card, 10-bit YCbCr 4:2:2, locked to the studio reference, so it cuts cleanly with the cameras in the switcher.



On air, locked to the house reference.

- **AJA** KONA, Io or Corvid (AJA Desktop Software): 1080 and 720, House ref or Free run.
- **Blackmagic DeckLink or UltraStudio** (Blackmagic Desktop Video): 720, 1080, 2K DCI, and UHD or 4K DCI on a 12G card. It locks to the reference by itself.
- Choose the **scan** (p, PsF or i) the switcher expects. The status shows the card, the format, the frames and whether the reference is **locked**.



SDI output with the reference status.

Fill and key (DeckLink) New

Send the picture **and its transparency** for the keyer of a vision mixer (ATEM, Ross, Grass Valley, Sony). Under SDI output, **Send**:

- **Program:** the finished picture.
- **Fill + key:** fill on the first SDI output, key on the next (DeckLink Duo 2, Quad 2, 4K Extreme, 8K Pro and others with external keying). In the mixer, set up a linear or downstream key with these two inputs.
- **Key on the card:** the card puts the graphics over the video coming into its own SDI input.

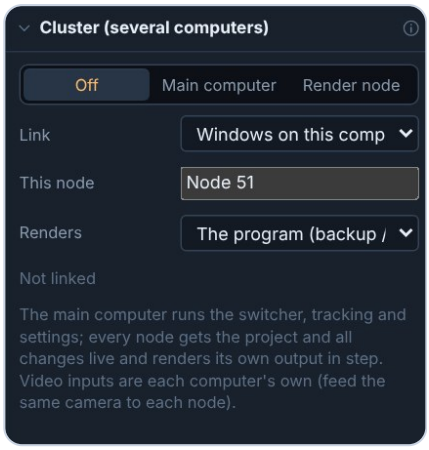
Content: Graphics (lower thirds, ticker, score, clock, logo, media in a box and replays) or **AR** (the 3D set with no sky or background, and no camera inputs, plus the graphics): virtual objects over the real camera in the mixer. **Premultiplied fill** matches most mixers (ATEM: Pre Multiplied Key on); turn it off if edges look dark. Holdout shapes cut the AR objects too, so a real desk can stand in front of AR graphics.

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NDI, program window and cluster

- **Output:** resolution (also vertical for social video) and frame rate: 23.976, 24, 25, 29.97, 30, 50, 59.94 or 60.
- **NDI output** DESKTOP: the program on the network for vMix, OBS, a TriCaster or an NDI-to-SDI box, frame-locked to your frame rate (needs the free NDI Tools).

- **Program window:** the program on its own, for a second screen, a projector or an HDMI-to-SDI converter.
- **Cluster (several computers)** DESKTOP: one **main** computer runs the switcher and the tracking; **render nodes** render a **mirror** of the program (a backup output), one **shot** continuously (an ISO feed for multi-camera productions), or one **LED wall section**. They link over the network (port 7350 unless set otherwise).

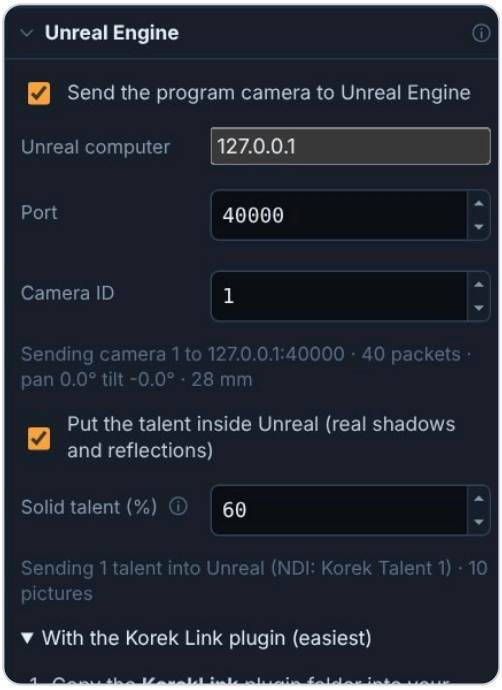


Cluster: several computers as one studio.

37

Unreal Engine with the Korek Link plugin NEW DESKTOP

Korek Link is the free Unreal Engine plugin for Korek 3D Studio. With it any Unreal level becomes your virtual set: Unreal draws the world (Lumen, Nanite, Niagara, Blueprints, any Fab environment) and Korek keys the talent, switches, adds graphics, streams and records. Download it from **ortho2d.com/studio-desktop**.



The Unreal Engine panel in Korek.

What you need

- Korek 3D Studio desktop **1.13** or newer.
- Unreal Engine **5.8** on Windows, on the same computer or another one on the network.
- The free **NDI Tools** (ndi.video/tools) on both computers.

Install the plugin (once per project)

1. Close Unreal. Unzip **KorekLink** and copy the **KorekLink** folder into the project's **Plugins** folder, next to the **.uproject** file (make the folder if there is none).
2. Open the project. Check it in **Edit › Plugins** (search "Korek").
3. In **Editor Preferences › Level Editor › Play**, choose **New Editor Window (PIE)** for a clean picture.

> Nothing needs placing in the level. When you press Play, the plugin adds its own Korek Camera, hides Unreal's default player (the sphere) and the touch joysticks, and starts sending the picture.

Setting 1 · The Unreal camera follows Korek's camera

1. In Korek: **Virtual Production › Unreal Engine**, tick **Send the program camera to Unreal Engine**.
2. **Unreal computer**: 127.0.0.1 on the same computer, otherwise its address. **Port**: 40000. **Camera ID**: 1.

3. Press Play in Unreal and move Korek's camera, switch shots or use a tracked camera: Unreal follows, lens and focus included.

Korek's floor origin is Unreal's 0, 0, 0. To stand the studio elsewhere, place a **Korek Camera** (Place Actors, search "Korek") and set **Stage Origin** to an actor that marks the spot, or type an **Origin Offset** and **Origin Yaw**. Its **Status** line shows what it receives.

Setting 2 · Unreal's picture as the background

1. With Unreal playing: **Background › Video input**, **Input**: **NDI: (Unreal computer) (Korek Unreal)**. Not listed? Press **Look for NDI sources and SDI cards**.
2. The picture arrives at **1920 × 1080**, only the game picture, without a title bar. Change it in Unreal's **Project Settings › Plugins › Korek Link › Output width / height** (for example 3840 × 2160); 0 keeps the window size.
3. Raise **Delay** on the camera input until a fast pan shows the person and the world moving together.

Setting 3 · The talent inside Unreal

1. Key the talent as usual and place them with **Place in the world**.
2. Tick **Put the talent inside Unreal (real shadows and reflections)**. Korek sends each keyed person as an NDI picture with transparency (**Korek Talent 1**, up to 4) with where they stand, and stops drawing them itself.
3. The plugin stands each person in the level as a **Korek Talent** card: Unreal's lights cast their shadow on its floor, they show in reflections, and objects in front hide them. Move them in Korek and the card moves in Unreal.

> The person keeps the light of your studio: Unreal adds the shadow and the reflections but does not relight the picture. Use **Talent brightness** to match the level. In this version the card works when playing from the Unreal editor.

Korek Link settings (Project Settings › Plugins › Korek Link)

SETTING	WHAT IT DOES
Port · Camera ID	The port Korek sends to (40000) and which camera to follow (0 = any).
Auto spawn camera	Adds a Korek Camera on Play when the level has none.
Hide player pawn	Hides the default player (sphere) and the touch joysticks. On by default.
Send NDI · NDI name · frame rate	The game picture as the NDI source "Korek Unreal", at your show's frame rate.
Output width / height	The size sent to Korek; 0 keeps the window size.
Show talent · casts shadow · brightness	The talent card from Korek, its shadow, and how bright it is.
Flip talent (advanced)	Mirror or turn the picture if it arrives the wrong way round.

If something does not work

- **Unreal does not move:** Unreal must be playing, the port the same on both sides, and no Live Link FreeD source on that port.
- **No "Korek Unreal" input:** install NDI Tools on both computers, press Play, then look for NDI sources again. NDI Studio Monitor should show it too.
- **Title bar or editor in the picture:** play in a New Editor Window or Standalone, with Output width and height set. Switch HDR output off.

VR and AR

Check the set before the shoot: walk inside it with a VR headset (a Meta Quest's browser, or Quest Link / SteamVR with Chrome or Edge), or put it on a table in AR (Chrome on Android), at any scale.

PART 7

Ready-made shows

Five complete recipes that put it all together. Follow one the first time, then change it to your own show.

- A news bulletin
- A talk show with guests, streamed
- A sports show with replays
- A travel show in a 360 world
- An LED volume shoot

38

A news bulletin

Set	People	Desk	Show	Out
News studio template	Anchor, AI auto key, depth keying	Real foreground on the real desk	Rundown, lower thirds, ticker	SDI + ProRes + stream

1. Build the **News studio** set. Its cameras become shots: Wide, Anchor close, Side.
2. Connect the anchor camera, press ✦ **AI auto key**, capture a clean plate, then ✦ **AI assist** for shadow and reflection.
3. The anchor sits at a real desk? Add a **Real foreground** shape over it, so the virtual desk never covers it.
4. Add two clips to the wall screen of the set and a trigger: when **Side** goes on air, the screen plays the next story.
5. In the Gallery, build the rundown: Opening (macro: lights, jingle, Wide with a camera move, title), Headlines (Anchor close, lower third), each story, Weather (location: weather wall), Goodbye.
6. Turn on the ticker and the clock. Feed live data for markets or weather.
7. Send SDI to the station switcher, record a ProRes master, and GO LIVE on YouTube at the same time. Run the show with `Space`.

39

A talk show with guests, streamed

Set	Host	Guests	Sound	Live
Talk show template	Studio camera, chroma key	Phones on the studio Wi-Fi	Mixer, mix-minus	YouTube + Facebook + Twitch

1. Build the **Talk show** set and key the host.
2. Open **Guests**, press **Take guests** and let two guests scan the QR codes. They join with their names.
3. **Put in the show** the first guest as a talent sitting on the sofa (AI only key if they have no green screen). Make the second guest the input of the big video screen in the set, like a video-wall interview.
4. In the Gallery's audio mixer add the host's microphone; the guests' faders are already there. They hear the show without their own voice.
5. Add YouTube, Facebook and Twitch under Live streaming, paste the three keys, choose 6000 kb/s. Check that the upload is at least 27 Mb/s.
6. Make a macro "Start": music, Wide shot, title, GO LIVE. Another "Break": jingle, logo full screen, guests muted.
7. Give the camera operator the phone tally page. Press **Start**.

40

A sports show with replays

Set	Inputs	Graphics	Replay	Control
Sports desk template	Pundits + match feed	Scoreboard + live data	Slow motion, marks	Ross switcher + Stream Deck

1. Build the **Sports desk**; key two pundits. Put the match feed (a capture card) on the big screen of the set.
2. Turn on the **Scoreboard** with team names and colours; feed the score from a live data address or the API (`/api/vars?home.score=2`).
3. In the Gallery's Replay, record the program and the match feed input; keep 2 minutes.
4. When something happens, press **MARK**. At the break, play the marks at 50% or 33%. Or press **Last 8 s** at once.
5. Make a macro "Goal": goal sound, replay last 8 s at 50%, WAIT 6 s, back to the desk shot, scoreboard updated.
6. Map the macros to a Stream Deck through Companion, or to Carbonite custom controls with RossTalk (`CC 1:n`), so the vision mixer fires them.

41

A travel show in a 360 world

World	Light	Ground	Holdout	Look
360 video of the city	From the 360, sun found	Shadow + reflection	Behind the car	Post process

1. **Background: 360 world**, choose the 360 clip of the city square. Turn it until the fountain is in front of the camera.
2. Key the presenter, place her on the floor and set the **Floor height** until her feet sit on the street.
3. Leave **Light from the 360** and **Sun: Found in the 360** on, raise Shadow to 0.6 and Reflection to 0.2 for wet stones.
4. A parked car is in the 360 picture: add a **Holdout** box (Hides: everything) where the car is. When she walks behind it, she disappears behind the car.
5. Finish with **Post process**: a warm grade, a little bloom on the street lights, light height fog, a soft vignette.
6. Record ProRes 4444 for the edit.

42

An LED volume shoot

Track
FreeD camera

Wall
Off-axis view

Colour
LUT + gains

Check
Moiré

Scale
Cluster nodes

1. Connect the tracking system (FreeD), set the origin, the lens range and the video delay.
2. Turn on **LED wall (XR)** and enter the wall's centre, width, height and turn.
3. Load the colour LUT from the LED processor or the colourist, and fine-tune the gains until the wall in the camera matches the set extension.
4. Run the **moiré check** with the wall's pixel pitch and your lens; move the focus or the camera if it warns.
5. A large wall? Split it over render nodes in the **Cluster**, one section each, with the main computer running the tracking.
6. Record camera data with timecode for the VFX team.

PART 8

New in 1.12.1

Eleven additions for bigger shows: real robotic cameras, programmed camera moves, a whole setup in one file, a recording of every camera, faster ways to dress the set, NDI inputs, SRT, the newsroom link, snap steps, and cameras and people that ride moving objects.

- PTZ cameras
- Camera moves
- Show presets
- ISO recording
- Move objects and lights in the picture
- 3D text
- NDI inputs
- SRT streaming
- MOS newsroom link
- Snap steps
- Moving objects that cameras and people ride
- Ray-traced quality, key finishing, undo everywhere

43

PTZ cameras NEW DESKTOP

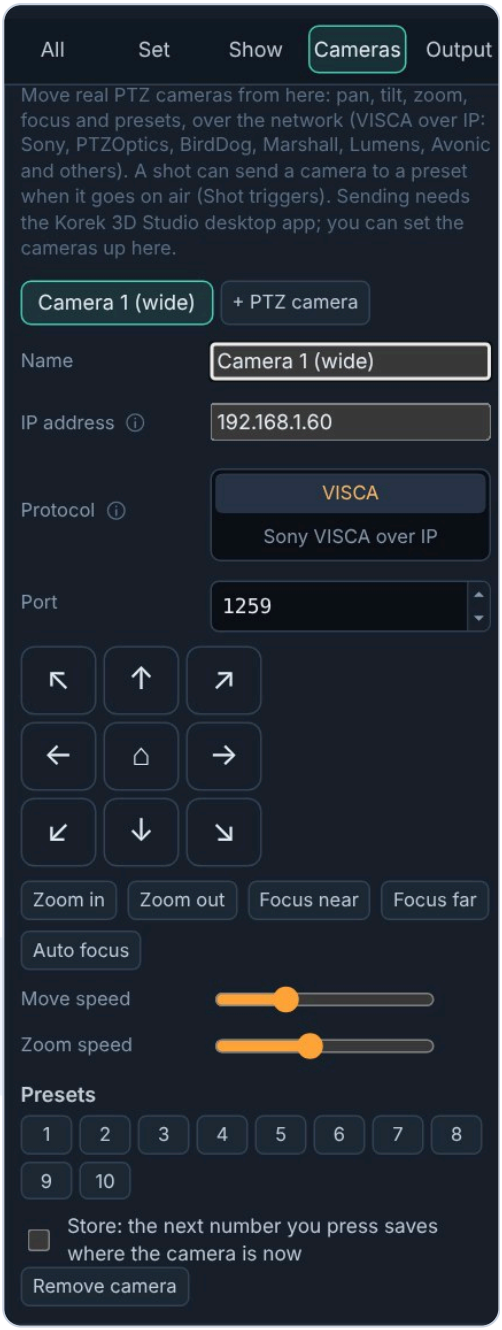
Move real robotic cameras from Korek, with no extra controller. It speaks **VISCA over IP**, the language of Sony, PTZOptics, BirdDog, Marshall, Lumens, Avonic and most other PTZ cameras.

1. Open the **Cameras** tab, section **PTZ cameras**, and press **+ PTZ camera**.
2. Type the camera's **IP address** (the one you open its web page with).
3. Choose the protocol: **VISCA** (port 1259) for most cameras, **Sony VISCA over IP** (port 52381) for Sony.
4. Hold an arrow to pan and tilt; let go to stop. Hold Zoom in / out and Focus near / far the same way. The house button sends the camera home.
5. **Presets 1 to 10**: press a number to send the camera there. To save where the camera is now, tick **Store** and press a number.

A shot that moves the real camera

In **Shot triggers**, choose a shot, add an action **PTZ camera**, pick the camera and a preset. Every time that shot goes on air, the camera drives to its preset. Use it on the shot before, so the camera is in place when you cut to it.

> The computer and the cameras must be on the same network, and the camera must have VISCA over IP switched on in its own settings. Up to 16 cameras.



PTZ cameras: pad, zoom, focus and presets.

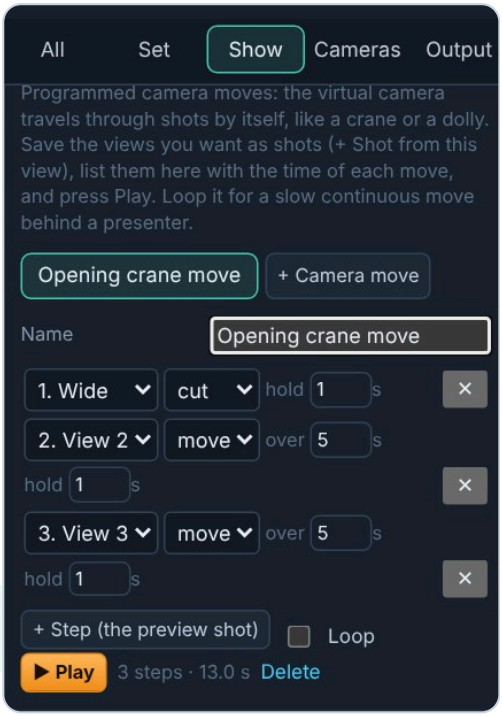
44

Camera moves NEW

A programmed move of the virtual camera through your shots, like a crane or a dolly that repeats perfectly every time.

1. Fly to the first view and press **+ Shot from this view**. Do the same for each view of the move.
2. Open the **Show** tab, section **Camera moves**, and press **+ Camera move**.
3. Each step is a shot. Choose how the camera gets there: **move** (it travels), **mix** (a dissolve) or **cut**; the seconds the move takes; and how long it **holds** before the next step.
4. Press **+ Step** to add the preview shot as the next step.
5. Press **Play**. Tick **Loop** for a slow move that never stops behind a presenter.

A 20 second move between two close views, looped, gives the gentle floating camera of a big news studio.



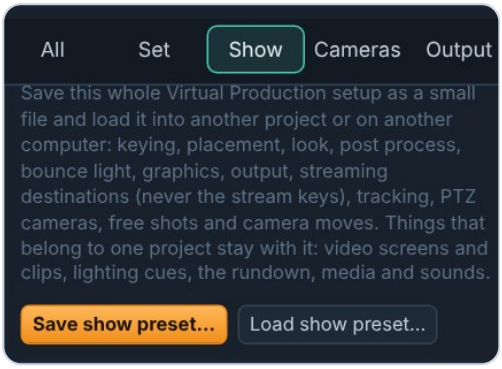
A camera move: steps, times and Play.

45

Show presets NEW

Save the whole Virtual Production setup as one small file, and load it into another project or on another computer.

1. **Show** tab, section **Show presets**, press **Save show preset**. You get a **.korekshow** file.
2. In the other project, press **Load show preset** and choose the file. `Ctrl` + `Z` goes back.



Save and load a whole setup.

IN THE PRESET	STAYS WITH EACH PROJECT
Keying, placement, look, post process, bounce light, graphics, output, streaming destinations, tracking, PTZ cameras, free shots, camera moves	Video screens and clips, lighting cues, the rundown, media and sounds

> Stream keys are never written into a preset: type them again on the new computer.

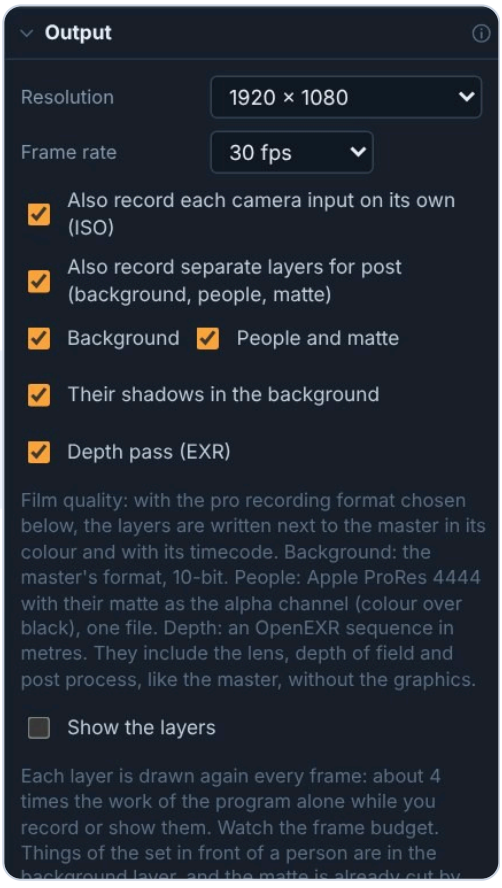
46

ISO recording NEW

ISO means every camera is recorded on its own, as well as the finished program. If a cut was late or a camera was better, you can fix it in the edit.

1. **Output** tab, section **Output**: tick **Also record each camera input on its own (ISO)**.
2. Press **Record** as usual. When you stop, the program file is saved, and one clean file for each camera input next to it.

> The camera files are the clean picture, before the key. Each one is extra work for the computer: watch the frame budget with three or more cameras.



Output: ISO and layers for post.

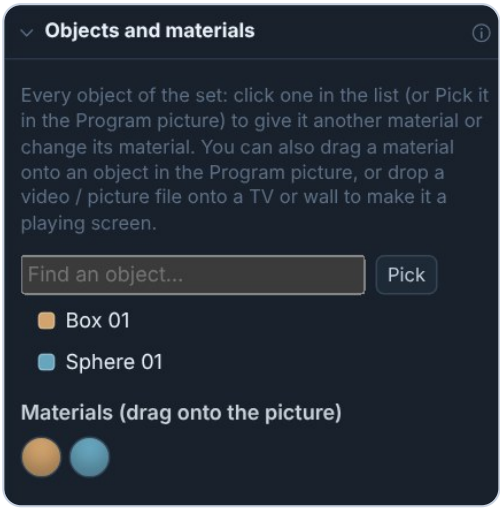
47

Move objects and lights in the picture NEW

Dress the set without leaving Virtual Production.

1. **Set** tab, section **Objects and materials**: pick an object in the list (or with Pick in the picture) and press **Move in picture**.
2. Drag it in the Program picture: it slides on the floor. `Shift`+drag moves it up and down. `Alt`+drag turns it.
3. For a light: section **Set lights**, press the move button on its row, then drag in the picture the same way.

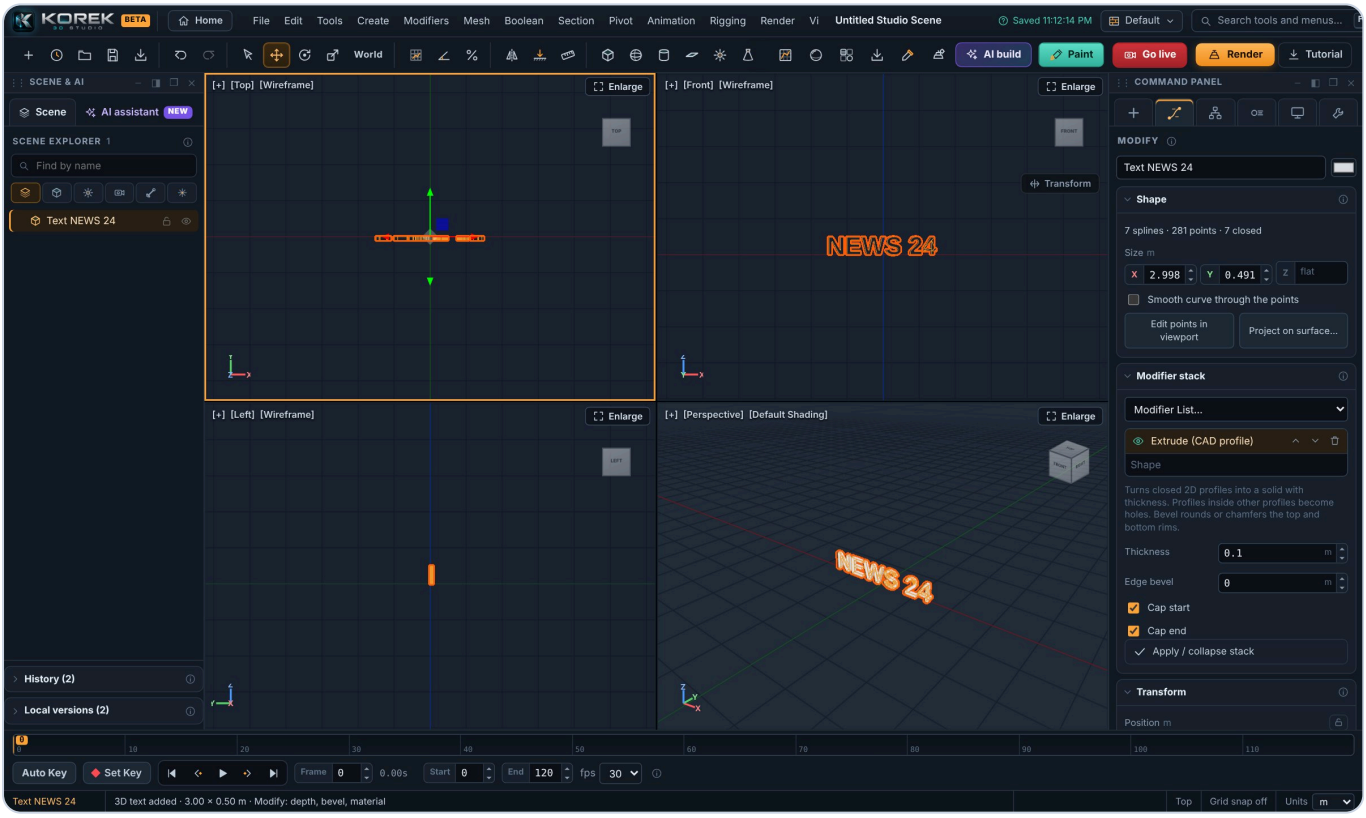
Each drag is one step of `Ctrl`+`Z`, and the move is saved in the project like any edit made in the Studio.



Objects and materials: move them in the picture.

48

3D text NEW



3D text in the Studio: type, choose the font, Create.

Solid 3D letters for a show title, a channel name or a sign on the set.

1. In the Studio: **Create**, **3D text**.
2. Type the words. Any language works, right-to-left and joined scripts included. Press Enter for a second line.

3. Choose the font, Bold or Italic, or press **Use a font file** for your brand's own font (.ttf, .otf, .woff).
4. Set the **letter height**, the **depth** and a small **bevel** so the edges catch the light, then press **Create**.

The text stands upright, facing the front. It stays editable: change depth, bevel and material in Modify, give it a glowing material for a neon sign, and it is part of the set in Virtual Production.

49

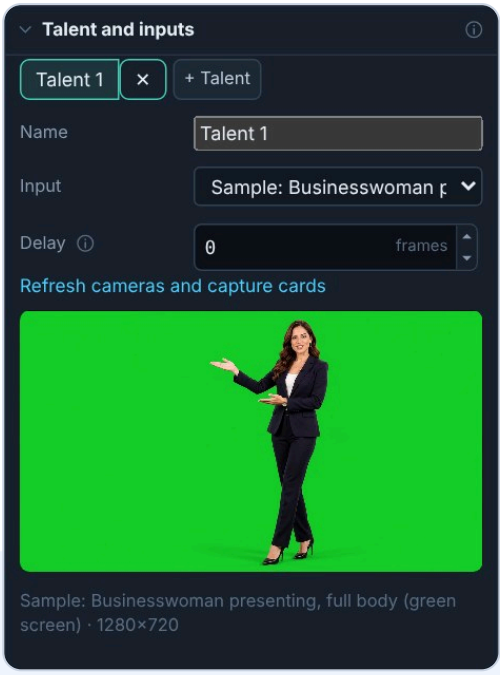
NDI inputs from the network NEW DESKTOP

Cameras, computers and graphics machines that send NDI on the studio network become inputs directly, with no extra tool. Install the free **NDI Tools** on the computer once.

1. In **Talent and inputs**, open the **Input** list. NDI sources are listed under **NDI sources (network)**.
2. Choose one. The line under the list shows its size when the picture arrives.
3. Press **Look for NDI sources** if a source was switched on after Korek.

An NDI source can also be the background video or the live input of a video screen. Up to 8 NDI inputs at once.

> Pictures only in this version: bring the sound in through the audio mixer. Each full-quality NDI input is work for the computer: watch the frame budget.



Talent and inputs: cameras, NDI and SDI sources.

50

SRT streaming NEW DESKTOP

SRT sends the program safely over the internet or between buildings to a decoder, vMix, OBS or a cloud ingest. It recovers lost packets, so the picture stays clean on a poor line.

1. **Output** tab, **Live streaming**, press **+ SRT**.
2. Type the receiver's address as **srt://host:port**, for example srt://192.168.1.50:9000.
3. If the receiver asks for a stream id, type it in the box below (it is optional). For other options, type them as the receiver's manual gives them, for example **streamid=studio1&latency=200000**.
4. Press **GO LIVE**. SRT goes out next to YouTube and the other destinations, each on its own connection.

> Korek calls the receiver, so set the receiver to **listener** mode. This version sends without passphrase encryption: use it on your own network or a private line.

51

MOS: the newsroom's running order NEW DESKTOP

The newsroom system (ENPS, iNEWS, Octopus, OpenMedia, Dalet and others) sends its running order to Korek over MOS, and it becomes the rundown in the Gallery. When the producer moves, adds or drops a story, the rundown follows by itself.

1. Ask the newsroom administrator to add Korek as a **MOS device**: this computer's address, ports 10540 and 10541, and the **MOS ID** shown in Korek.
2. **Show** tab, **MOS (newsroom)**: type the newsroom's **NCS ID** and tick **Take the running order from the newsroom**.
3. In the newsroom, make the running order MOS active. Its stories appear in the Gallery's rundown with their names and planned times.
4. In the Gallery, give each story what it does in Korek: take a shot, a title, a clip, a lighting cue.

THE NEWSROOM OWNS	KOREK KEEPS
The order of the stories, their names, their planned times	What each story does (its actions and your notes), even when the story is moved or renamed; items you added by hand

Tick **Tell the newsroom which story is on air** and give the newsroom's address to light the story up in the producer's running order.

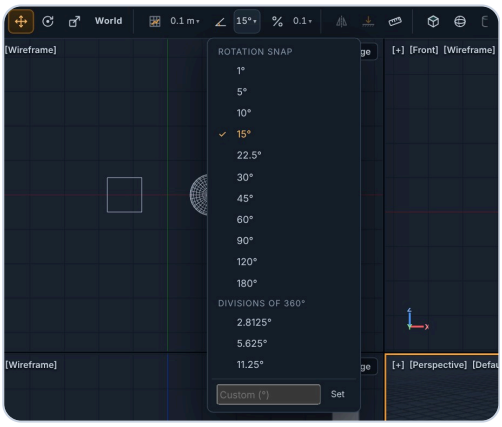
> MOS has no password. Type the newsroom's ID so that only it is listened to, and its address in **Only from**.

52

Snap steps for move, rotate and scale NEW

In the Studio's top toolbar, each of move, rotate and scale has a snap button and, next to it, the step in use.

1. Click the **snap button** to switch that snap on or off.
2. Click the **number** next to it to choose the step: rotation 5°, 15°, 45°, 90°, 180° and more; move 1 cm to 100 m; scale 0.25, 0.5, 1 and more. Choosing a step switches the snap on.
3. Type your own step in **Custom** and press Enter.
4. Right-click the Move, Rotate or Scale tool to open its steps directly.



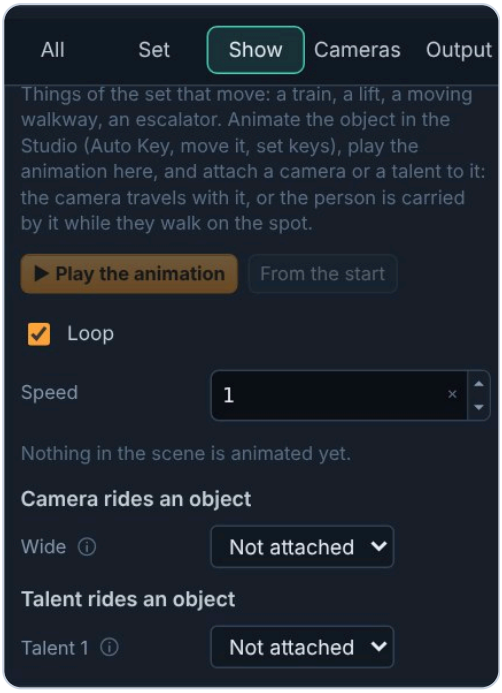
The rotation steps.

The move steps are shown in the scene's units. Change the units (m, cm, mm, ft, in) at the bottom of the move steps, or in the status bar. Your snap choices are remembered.

53

Moving objects: a camera or a person that rides NEW

Put the camera on a moving train, or let a moving walkway, a lift or an escalator carry the presenter while they walk on the spot in front of the green screen.



Play the animation and attach.

1. Make the object move

1. In the Studio, select the object (the train, the walkway's platform, the lift floor).
2. At frame 0 press **Set Key**. Go to a later frame, move the object to where it ends, press **Set Key** again.

2. Play it in the show

1. In Virtual Production: **Show** tab, **Moving objects (ride)**, press **Play the animation**. Tick **Loop** for a walkway that never ends; **Speed** makes it slower or faster.

3. Attach

1. **A camera:** fly a free shot to the view you want (inside the train looking out, on the lift), make it the preview shot, and choose the object under **Camera rides an object**. It keeps that view of the object and travels with it.
2. **A person:** place the talent on the object, then choose the object under **Talent rides an object**. They are carried with it and turn with it.

An airport walkway: animate a thin floor panel along the corridor, loop it, attach the talent to it, and ask the presenter to walk on the spot. On air they travel down the corridor.

> Choose **Not attached** to let go: the camera or the person stays where it is at that moment. A scene camera that you animated in the Studio follows its own animation by itself.

54

Ray-traced quality for locked shots NEW

For a shot whose camera does not move (a news desk, a talk show wide), Korek renders the set once from that camera in ray-traced quality: true bounce light, real reflections and soft shadows. The live people are keyed in front of that picture.

1. Fly to the view and press **+ Shot from this view**, or choose a scene camera shot. Make it the preview shot.
2. **Set** tab, **Ray-traced quality (locked shots)**. Choose the quality: 128 samples is good, 512 for glossy floors.
3. Press **Render this shot in ray-traced quality**. You see it getting cleaner; press **Stop and keep it** when it is clean enough.
4. Take the shot. While its camera stays in that view, the ray-traced picture is on air. If the camera moves, the live set comes back by itself.

GOOD TO KNOW

Things in front of a person	A desk or a column of the set still hides the person behind it.
Shadows and reflections of the people	Not on a ray-traced shot: the picture was rendered without them.
Post process and depth of field	Off for that shot: the picture already has its own light.
After changing the set or its lights	Press Render again.
Film colour, pro recording, SDI	While one of these runs, the live set is shown.

> Render before the show, not on air: it uses the graphics card heavily while it runs.

55

Finishing the key: clean edges and hair NEW

After the key, the AI one too, a thin line of the screen's colour can stay on the outline, and hair can look cut out. The finishing controls are at the bottom of the **Key** section.

1. Press **Clean edges and hair** for a good starting point, then adjust.



The Key panel.

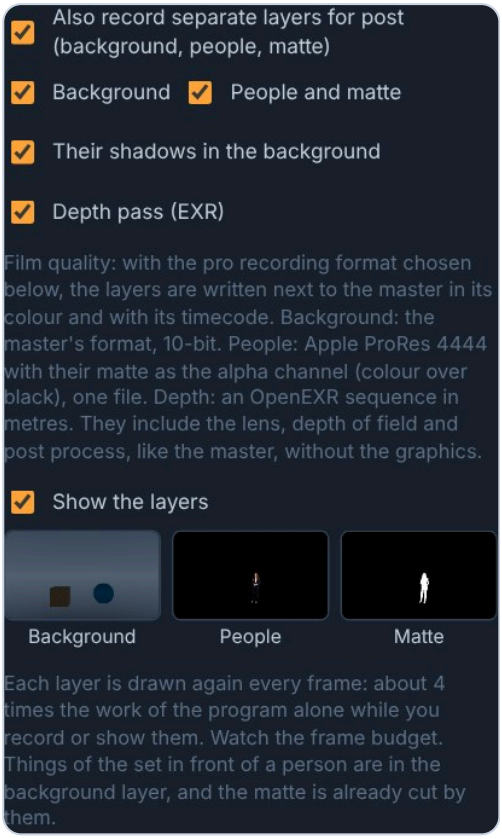
CONTROL	WHAT IT DOES
Cut the edge	Trims pixels from the outline all round: the green line on the edges goes. 1 is usually enough.
Soften the edge	A soft fall-off inwards, so the outline is not hard like a sticker.
Edge colour	Takes the screen's colour out of hair, fur and motion blur. Works with the AI key too.
Hair detail	AI and hybrid keys: fine strands come from the screen colour, so loose hair stays and the green between the strands goes. Needs a green or blue screen behind the person.
Clean the background	Removes the faint haze and noise left around the person.
Fill the person	Closes faint holes and see-through patches inside the person.

For hair: AI or hybrid key, Hair detail 0.7, Edge colour 0.8, Cut the edge 1. If fingers get thin, lower Cut the edge.

57

Layers for post: background, people and matte NEW

For film and commercial work, Korek records the parts of the picture as separate files with every take, frame for frame with the program, so the comp can be rebuilt and finished in post.



Layers for post, with the live pictures of each layer.

LAYER	WHAT IT IS
Background	The set without the people. Their shadows stay in it unless you untick them. Things of the set that stand in front of a person are here.
People	The keyed people alone, over black.
Matte	White where a person is, black elsewhere, already cut by the set objects in front of them.

1. **Output** tab, section **Output**: tick **Also record separate layers for post**.
2. Tick **Show the layers** to see the three pictures live and check them.
3. Press **Record**. When you stop, the program file is saved and the three layer files next to it.

In post: **background × (1 − matte) + people** gives the program again. Re-key, re-grade or move the people without touching the set. Use the camera data of the same take (section 34) to add 3D elements that follow the camera.

> The layers are the picture before post process, depth of field and graphics. Each layer is drawn again every frame, about four times the work of the program alone: use a strong graphics card and watch the frame budget. The files are high-quality video, not ProRes, in this version.

58

Working with Unreal Engine as the background NEW

Unreal (or another engine) renders the world; Korek keys the people, puts them in front of it and behind its objects, and records the layers. Korek's camera drives Unreal's, so both pictures move as one.

1. **Camera:** in the **Unreal Engine** section, switch on sending the camera. In Unreal, add the FreeD source in Live Link so its camera follows Korek's.
2. **Picture:** send Unreal's output to this computer (NDI or a capture card). In **Background**, choose **Video input** and pick it.
3. **Depth:** in Unreal, make a post process material that writes the scene depth divided by a far distance to the colour (in centimetres: 50 m is 5000), and send that view as a second output. Choose it as **Depth input**, and type the same far distance in **White is at**. People now go behind Unreal's objects by themselves.
4. **Timing:** Unreal's picture arrives a few frames after the camera's. In **Talent and inputs**, raise **Delay** until a fast pan shows the person and the world moving together.
5. **Shadows:** tick **The people cast a shadow on the background's floor**, set the floor height and turn the light to match Unreal's main light.

CONTROL	WHAT IT DOES
White is at	The distance white means in the depth picture. Keep it just beyond the farthest thing a person walks behind: the smaller, the finer the depth.
Edge	How softly a person disappears behind an object. Raise it if the cut flickers.
Hold back	Delays the background instead, for when it arrives earlier than the camera.

> With a delay on the camera input, prefer the chroma key: the AI key reads the live picture and would run ahead. The depth picture over NDI has 256 steps: with White at 20 m, one step is about 8 cm.

56

Undo everywhere NEW

`Ctrl`+`Z` brings a value back in the Studio and in Virtual Production, even when the list, tick box, slider or number box you just changed still has the focus. `Ctrl`+`Shift`+`Z` or `Ctrl`+`Y` redoes it. In a box where you write words (a name, a script), Ctrl+Z undoes your typing as usual.

PART 9

New in 1.12.2

Finding any option in seconds, a colourist's tools, your own graphics on the screen and in the world, voice control, people who walk and teleport without camera tracking, captured real places as sets, SDI inputs and curved LED walls.

- Search for any option
- Colour correction
- Custom graphics and AR
- Size and place of every graphic
- Voice commands
- Teleport and FreeWalking
- A 3D body from the video
- Splat worlds
- SDI inputs
- Curved LED walls
- 360 world: video, rotation, sun

59

Find any option NEW

The search box in the top bar of Virtual Production knows every section and every single option.

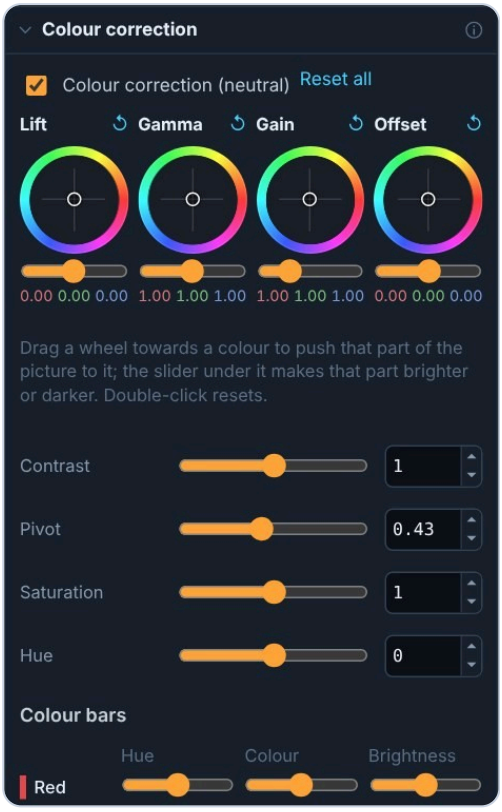
1. Press `/` or `Ctrl`+`F` (or click the box).
2. Type what you are looking for: **hair detail**, **frame rate**, **shadow softness**.
3. Press `Enter`, or click one of the results.

The right tab opens, the section opens, the panel scrolls to the option and it flashes. When the same name exists in two places, each result says where it is. When an option only shows in another mode, a note tells you which.

60

Colour correction NEW

The same tools for one camera input and for the whole Program. For a person: left panel, **Colour correction** (it works after the key). For the Program: **Post process**, **Colour wheels**.



Colour correction.

TOOL	WHAT IT CHANGES
Lift	The dark parts. Drag the wheel towards a colour to tint the shadows; the slider under it lifts or lowers them.
Gamma	The midtones: faces and most of the picture.
Gain	The bright parts.
Offset	Everything at once.
Contrast and Pivot	Contrast stretches the picture around the Pivot level.
Colour bars	Red, Skin, Yellow, Green, Cyan, Blue, Magenta. Each bar changes only its own colours: turn the hue, make it stronger or weaker, brighter or darker.
Tints	A colour for the shadows, one for the highlights, one for the whole picture.

Double-click a wheel or a slider to reset it. Fix a face with the Skin bar, not with the whole picture: the set keeps its colours. Ctrl+Z works on every change.

61

Custom graphics and AR NEW

Show tab, section **Custom graphics and AR**. Every graphic gets one big button: click to take it in, click again to take it out.



Custom graphics and AR.

GRAPHIC	WHAT YOU GIVE IT
Your design	A picture (PNG with transparency, JPG, SVG) or a video with transparency (WebM) made in any program. Add text boxes and drag them into place on the preview.
Table	A title, column names and one row per line.
Bar chart	One bar per line: name, value.
Line-up	A formation and one player per line: number, name. Add photos per player.
Weather	One day per line: day, sky, high, low. Sky words: sunny, partly cloudy, cloudy, rain, storm, snow, wind, fog, night.
Match-up	Two sides with their score, then one line per number: name, left, right.
Set object	Any object of your 3D set (a logo, a trophy, a 3D title). It stays hidden until you take it in.

1. Click the kind under **Add**. For your design, choose the file.
2. Choose **On the screen** (over the picture) or **In the world (AR)**: it then stands in the 3D set, every camera sees it in perspective and people can stand in front of it.
3. For AR, click **Put it in front of the camera**, then set position, height and turn.
4. Choose how it comes in (fade, slide, rise, grow) and how long that takes.

Your own fonts: **+ Font file** (TTF, OTF, WOFF), then choose the font in a text box. Live data works in every text and row: write {{name}} (section 25).

Macros, the rundown, the remote and voice can take a graphic in and change its words: **item.NAME.on=true**, **item.NAME.BOX NAME=New text**.

62

Size and place of every graphic NEW

Under each built-in graphic (lower third, logo, clock, LIVE bug, ticker, scoreboard, information box) there are three boxes: **Size** in percent, ↔ to move it across and ↕ to move it down, in percent of the picture. The small arrow puts it back. The ticker has size and up / down only, because it always spans the picture.

63

Voice commands NEW

Show tab, section **Voice commands**. Tick **Listen for voice commands** and speak. The microphone listens only while this is ticked. What it hears is listed, with what it did.



Voice commands.

SAY	IT DOES
camera two · take wide shot · cut to desk · preview three · take	The switcher
lower third in · ticker off · top scorers in	Graphics, also your own by name
run opening	A macro
start recording · go live · end stream · next · replay · blackout	The show
teleport Anna to the desk · beam Anna out	A person (section 64)

> Set a **Wake word** (for example "studio") so ordinary talk in the room never triggers anything: you then say "studio, camera two". Speech recognition needs Chrome or Edge and an internet connection; the desktop app cannot listen yet. You can always type a command in the Try box.

64

Teleport and FreeWalking NEW

Left panel, **Place in the world**, for the selected person.

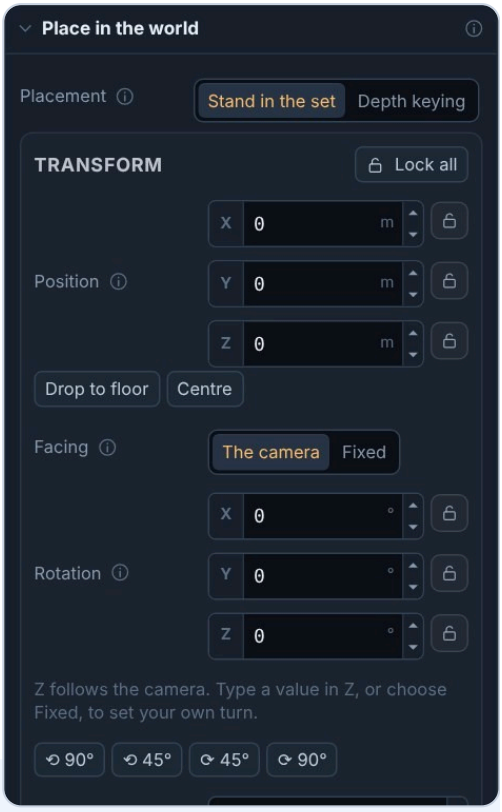
Teleport. Choose how the person appears: cut, fade or beam. Put them somewhere and click **Save this place as a spot**. Click a spot to send them there: they beam in at the new place. Unticking **Visible** beams them out.

FreeWalking is for a real camera that is locked off and not tracked.

1. Tick **The person walks through the set**.
2. Type where the real camera stands: its distance to the person's mark, the lens height, the tilt and the lens angle.
3. The person's position above is the mark: the point on the floor the camera looks at.

Korek finds the feet in the picture and puts the person at that very place of the set. They walk closer, further and sideways through it, and the virtual camera is free to move.

> The key must show the feet on the floor. Measure the camera carefully: a wrong height or tilt makes the person slide on the floor.



Place in the world: teleport and FreeWalking.

65

A 3D body from the video NEW

In **Place in the world**, set **Body depth** (about 0.25 m for a standing person). The person's outline is inflated like a pillow, so when the virtual camera moves round them they have volume instead of being a flat cut-out. 0 is flat.

> It is a relief made from the outline, not a 3D scan: it has no back, and it cannot tell an arm in front of the chest from the chest. Keep camera moves round a person modest.

66

Splat worlds: a captured real place as the set NEW

A place captured as Gaussian splats (a **.ply** or **.splat** file from a capture app or a splat trainer) becomes a world the virtual camera moves through. **Set** tab, section **Splat worlds**.

1. Click **+ Splat file** and choose the file.
2. If the place lies on its side, change **Turn** X (most captures need -90, some 90 or 180).
3. Set **Size** so something you know matches: a door is about 2 m.
4. Lower **Detail** if the picture gets slow.



Splat worlds.

> People are always drawn in front of a splat world: it is a background, they cannot walk behind its objects yet. It does not catch their shadows, and the set's lights do not change it.

67

SDI inputs NEW

In the desktop app, the SDI inputs of Blackmagic DeckLink and AJA cards appear in every input list under **SDI inputs (capture cards)**, next to the NDI sources. Choose one like any camera. Install the card's own driver first (Blackmagic Desktop Video, AJA Desktop Software).

> Blackmagic inputs follow whatever format arrives, up to what the card can take. AJA inputs take SD, HD and 3G (up to 1080p60) in this version.

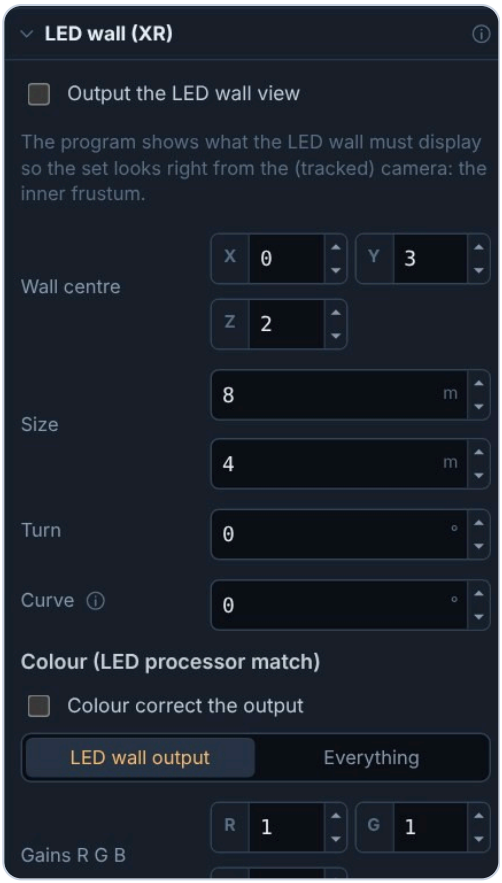
68

Curved LED walls NEW

In **LED wall (XR)**, **Curve** is how many degrees the wall turns from one end to the other (0 is a flat wall). The width is then the length along the curve. **Sections** is the number of flat pieces the curve is drawn with: use the number of cabinet columns of the wall, or 8 to 12.

The output is the wall unrolled flat, section by section, which is how an LED processor maps it. The panel shows the radius and the straight distance between the two ends so you can check them against the real wall.

> Every section is drawn on its own, so a curved wall costs more speed than a flat one. A minus value curves away from the stage.



LED wall (XR), curved walls.

69

360 world: video, rotation and sun NEW

360 videos now play as the world. **Rotate the view** turns the world around you to choose what is behind the people. **Sun direction** and **Sun height** are always visible and set where the people's shadows fall; **Shadow softness** blurs them. The shadow floor follows the people, and their reflection on the floor is on by default.

PART 10

New in 1.12.4

A ready studio to start from, a 360 world around your own set, cinema plates at full quality with real lights that follow them, three new keyers, doors and stairs that move, more control in the Gallery, and AI that works from your own references.

- From green screen to air
- The sample studio
- A 360 world around your set
- Plate shapes for cinema
- Pro plates (ProRes, DNxHR, EXR)
- Lights that follow the plate
- Luma, HSV and vector keys
- Video screens: lit or unlit
- Animated doors
- Dynamic stairs
- Gallery show control
- Graphics with picture tiles
- Flying the free view
- USD files
- New remote commands
- AI with your own references
- Saving recordings

70

From green screen to air NEW

This is the whole idea of Korek 3D Studio in one page. A presenter stands in front of a plain green screen. Korek 3D Studio keys her out live, puts her in the Korek studio set with its curved video wall, and lights her to match. Nothing else is needed: no render server, no separate keyer, no second computer.

CAMERA



The camera picture: the presenter in front of the green screen (shown here next to the set for comparison).

PROGRAM · ON AIR



The Program output: the same presenter in the Korek studio set, with her reflection on the floor and the video wall behind her.

The five steps

1. **Camera in.** Left panel, **Talent and inputs**: choose the camera (USB, capture card, NDI or SDI).
2. **Key.** Left panel, **Key**: **AI + chroma** for green screen, then **Pick** and click on the green. Raise **Spill** until the green edge on the hair is gone.
3. **Set.** Set tab, **Set (3D scene)**, **Add the sample set**, or open your own set (chapter 71).
4. **Place. Move in picture** under the switcher: drag the presenter onto the floor mark. **Shadow and reflection** gives her a reflection on the polished floor.
5. **Take.** Choose a shot, press `Enter` (TAKE). The red Program frame is what goes on air, to the recorder and to the stream.

> **Light the green screen evenly** and keep the presenter about 2 m in front of it. An even screen keys in seconds; shadows on the screen and green light bouncing on the presenter are what make a key hard.

71

The sample studio NEW

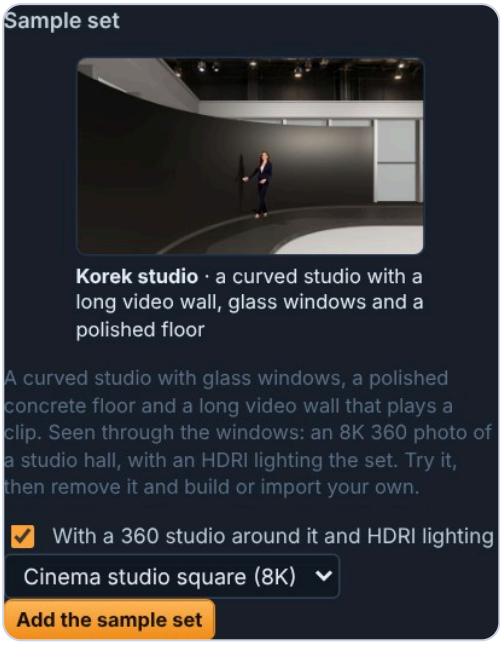
SET TAB · **SET (3D SCENE)** · SAMPLE SET

A complete studio comes with the app, so you can try everything in this guide before you build your own: a curved set with glass windows, a polished concrete floor and a long video wall that plays a clip.

1. Open **Set (3D scene)** in the Set tab.
2. Leave **With a 360 studio around it and HDRI lighting** ticked to see a real studio through the windows, and choose which one: **Cinema studio square (8K)** or **Studio hall (4K)**.
3. Press **Add the sample set**. It loads in one step.

The video wall becomes a screen under **Video screens**, so you can change its clip, its brightness and how it is lit there (chapter 77). The 360 studio and its HDRI light are set up for you in **Background** (chapter 72).

Taking it away: `Ctrl`+`Z` straight after adding it, or **Remove the sample set** at any time. It removes the set's objects, its video wall screen and its 360 world, and leaves everything of yours.



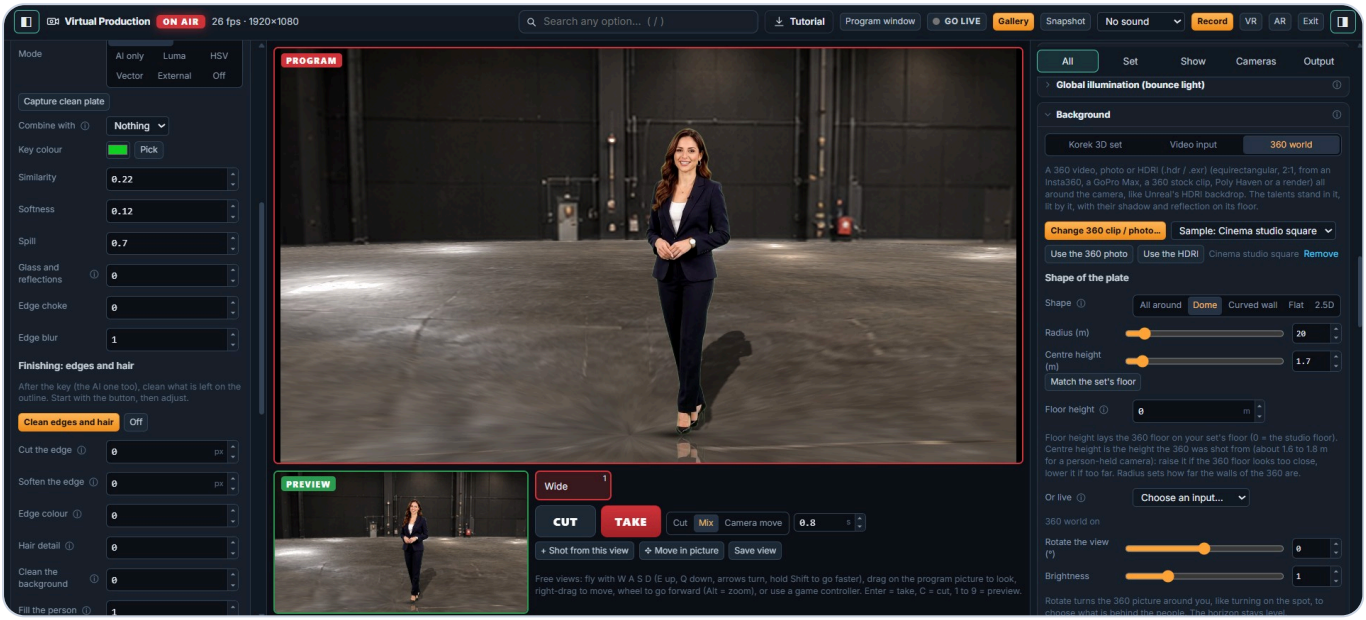
The Sample set panel: its picture, the 360 studio choice and one button.

72

A 360 world around your set NEW

SET TAB · **BACKGROUND** · KOREK 3D SET · 360 SKY AROUND THE SET

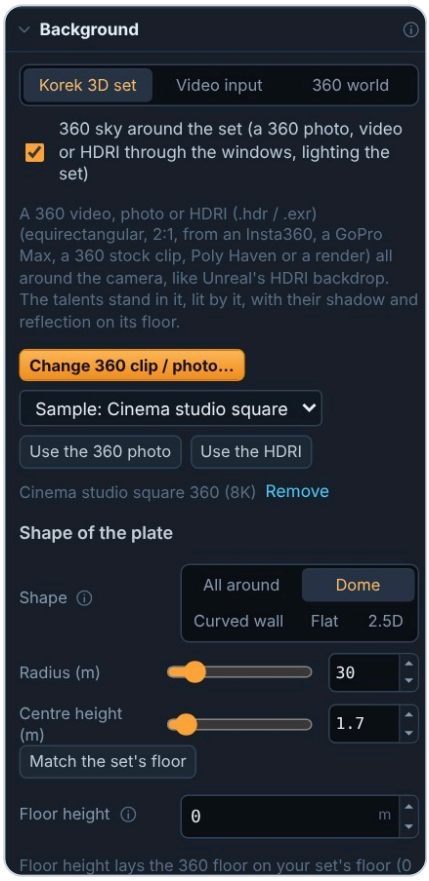
Your 3D set can now sit inside a 360 photo, a 360 video or an HDRI, the way Unreal uses an HDRI backdrop. People see the real place through the windows and the doors, and the set is lit by it.



A 360 world on Program: the Cinema studio square around the presenter, with the dome controls on the right.

Set it up

1. In **Background**, keep **Korek 3D set** and tick **360 sky around the set**.
2. Choose your own 360 photo, video or HDRI with **Choose a 360 clip or photo** (it reads **Change 360 clip / photo** once one is in).
3. Or pick a ready studio in the **Sample** list (Cinema studio square or Studio hall), then **Use the 360 photo** for what people see and **Use the HDRI** for the light. The picture and the light can be two different files: a sharp 8K photo to look at and a high-range HDRI to light with.



Background with a 360 sky around the set: file, sample studio, shape and floor controls.

Make the floor meet your set's floor

A 360 picture is a big sphere. Its floor has to be at the same height as the floor of your set, or the set seems to float or sink.

CONTROL	WHAT IT DOES	TYPICAL VALUE
Shape	All around (a sphere), Dome (a sphere with a flat floor), Curved wall, Flat, 2.5D. Dome is best for sets: people and furniture stand on a real floor.	Dome
Radius	How far away the walls of the 360 are. Raise it if the room looks too small.	20 to 30 m
Centre height	The height the 360 was shot from. Raise it if the 360 floor looks too close, lower it if it looks too far.	1.6 to 1.8 m
Match the set's floor	One click: puts the 360 floor at the height of your set's floor.	Click once
Floor height	The same by hand, in metres (0 = the studio floor).	0 m
Rotate the view	Turns the 360 around you, to choose what is behind the people. The horizon stays level.	Any
Brightness	How bright the 360 picture is, separately from the light it gives.	1

> **Reflection height** (in the same panel) now moves the presenter's reflection too, so a person, the set and the 360 all mirror at the same floor line.

73

Plate shapes for cinema NEW

SET TAB · **BACKGROUND** · 360 WORLD · SHAPE OF THE PLATE

When the background is a filmed plate rather than a 3D set, its shape decides how it moves with the camera. Choose the shape that matches how the plate was shot.

ALL AROUND
A full 360 sphere. For 360 cameras (Insta360, GoPro Max) and HDRIs.

DOME
A sphere with a flat floor at Floor height. The talent stands on the plate's own floor, with shadow and reflection.

CURVED WALL
A cylinder of a chosen arc (for example 180°). For wide panoramic plates and car process work.

FLAT
A flat screen at a distance and width you choose, raised by Lift. For ordinary 2D plates.

2.5D
A flat plate pushed into depth by a depth map: near things move more than far things when the camera moves.

DISTANCE AND SIZE
Distance, width, lift, arc and depth amount are all in metres, so the plate keeps the real scale of the place.

> For a tracked camera, Dome and 2.5D give the most real parallax. For a locked-off camera, Flat is enough and the lightest.

74

Pro plates: ProRes, DNxHR, EXR NEW DESKTOP

SET TAB · **BACKGROUND** · VIDEO INPUT · PRO PLATE (CINEMA)

For cinema work the plate must not be compressed again. The desktop app plays the camera originals at full quality behind the talent, decoded on every processor core and sent to the graphics card in 10-bit.

KIND	FORMATS
Video files	ProRes 422, 4444, XQ · DNxHR · HAP · NotchLC · CineForm · uncompressed (.mov, .mxf)
Image sequences	EXR, DPX, TIFF, PNG: choose any one image of the sequence
Size	Up to 8K and 12K plates. **Zoom** and **Position** cut the part you need from the full-resolution plate before scaling, so a reframe keeps every source pixel.
Playback size	**Program size** (every pixel the output can show), **Full size** (the plate's own resolution, for heavy reframing) or **Half** (lighter on the computer).

Play, Pause, Restart and Loop are in the panel and in the Gallery (chapter 80). If the status line says frames are late, the computer is not keeping up: choose a lighter Playback size.

> Plates stay on your computer. The project keeps the file's path, not the file, so copy the plates with the project when you move to another machine.

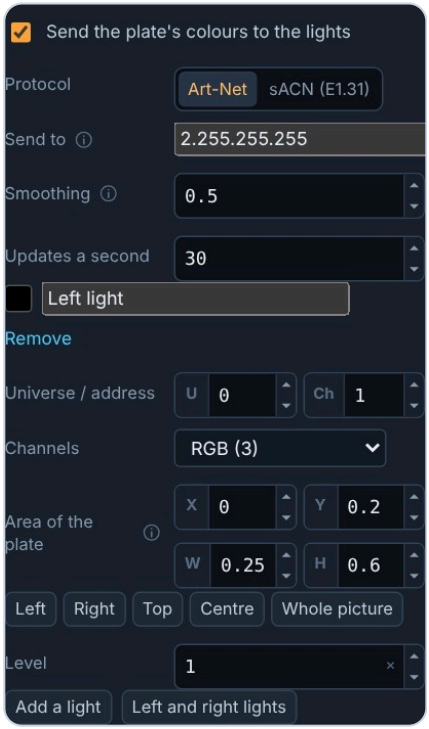
75

Lights that follow the plate NEW DESKTOP

SET TAB · **BACKGROUND** · VIDEO INPUT OR 360 WORLD · REAL LIGHTS FOLLOW THE PLATE

Real studio lights take the colour of the plate, live. Headlights pass in the plate and the light on the actor's face passes with them; a sunset turns the key light orange; a neon sign flickers on the cheek. This is image-based lighting for real fixtures.

1. Tick **Send the plate's colours to the lights**, choose **Art-Net** or **sACN (E1.31)**, and in **Send to** the address of the lighting node or console.
2. **Add a light** for each fixture, or **Left and right lights** for a pair in one click. Give each its name, **Universe / address** and **Channels** (RGB, Dimmer + RGB, RGBW or Dimmer).
3. Set its **Area of the plate** with the quick buttons (Left, Right, Top, Centre, Whole picture) or as X, Y, W and H from 0 to 1 of the picture. That area's average colour drives the light. On a 360 plate the area can also be behind the camera.
4. Set **Level** per light, and **Smoothing** and **Updates a second** for the whole map. More smoothing means calmer light; less means faster flicker.



Each studio light takes the colour of its own area of the plate.

The small swatch next to each light shows the colour being sent now. A button in the Gallery switches the whole map on and off during the show.

76

Luma, HSV and vector keys NEW

LEFT PANEL · **KEY** · MODE

Three keyers join Chroma, AI + chroma and AI only. They are the classic tools of a broadcast keyer, for the cases a green screen cannot solve.



The HSV key: hue, saturation and value ranges.

MODE	KEYS OUT	USE IT FOR
Luma	Everything darker than a level (or brighter, with Invert), with a soft edge	White or black limbo cycloramas, titles on black, fire and smoke shot on black.
HSV	A hue and a width around it, above a saturation and a brightness	Uneven screens, coloured cycloramas, keying one coloured object in a real room.
Vector	Colours within an angle of the key colour on the colour wheel, above a saturation	Fine hair, smoke and glass on green or blue, with the softest edges.

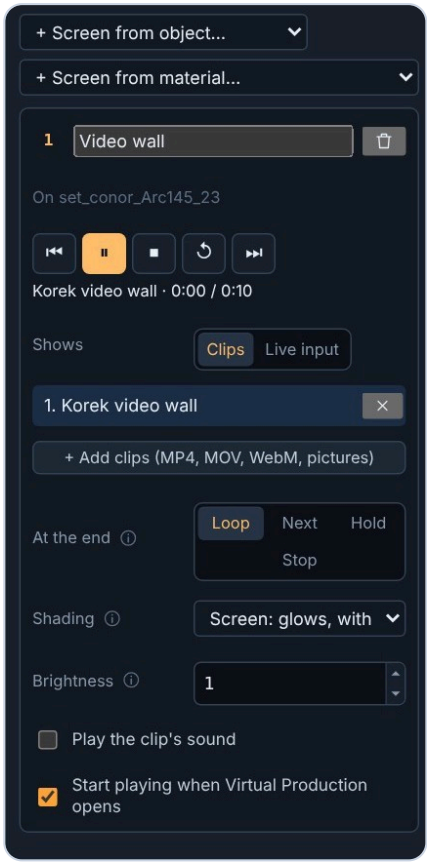
Combine with joins two keys in one matte: for example HSV for the screen plus AI to remove the lights and stands that are not green. Spill, choke and blur apply to the result as before.

77

Video screens: lit or unlit NEW

SET TAB · **VIDEO SCREENS** · SHADING

Each video screen of the set now has a **Shading** choice, so a video wall can be a real screen that glows, a pure picture untouched by the light, or a printed surface lit by the studio.



The sample studio's video wall as a screen: clips, transport, Shading and Brightness.

SHADING	WHAT YOU SEE	POWER
Screen	It glows with its own light and its glass still reflects the set. The default, like a real LED wall or TV.	Brightness 0 to 100
Unlit	Only its own light. Lights, bounce light, shadows and reflections do not touch the picture: the video stays exactly as it was made.	Emissive power 0 to 100 (1 = the video as it is)
Lit	The picture is painted on the surface. It receives the set's light, shadows and reflections and does not glow: a poster, a banner, a projection on a wall.	From the set's lights

In the studio (Material editor)

Drop a video file onto any object in the viewport and it plays on that object as its own material. Press `M` to open the Material editor: the **Video** section has Play, Loop, Speed, Sound, the same **Shading** choice (Lit or Unlit) and **Glow**, which becomes **Emissive power** when Unlit. Type any value up to 100.



Material editor, Video: Unlit with an Emissive power of 3.

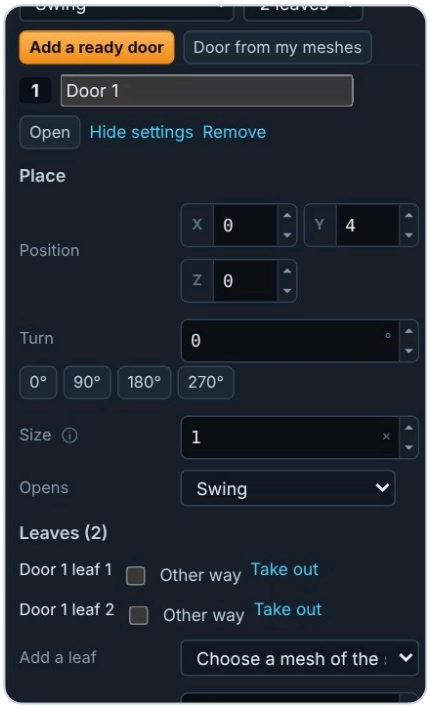
> Typical values: a TV in a lit room 1, an LED wall 2 to 4, a cinema screen in a dark set 6 to 10. A very high power makes the screen bloom when Post process bloom is on.

78

Animated doors NEW

SET TAB · **DOORS**

Doors that open and close on a trigger, for entrances, reveals and space-station sets. Every door has a number and a name, so the Gallery, a rundown item, a macro, a Stream Deck and the remote API can all call it.



A door with its number, its trigger button and its motion.

Add a door

- Choose the style and the number of leaves in the two lists, then **Add a ready door**: a complete door placed in the set, numbered 1, 2, 3…
- **Door from my meshes**: any objects of the set become the leaves. Add more with **Add a leaf**, flip one with **Other way**. Your own door design then opens like a ready one.

How it opens

STYLE	MOVEMENT
Swing	Turns on its hinge by the Angle you choose; **Opens towards the camera** chooses the side.
Slide sideways · up · down	Slides along the wall, into the ceiling or into the floor.

Space station (iris)	The leaves pull back all round from the middle.
Space station (split)	The leaves part from the middle with a step out first.

Per door: **Opens** (the style), **Time**, **Motion** (Smooth, Even or Bounce) and **Starts open**. **Position**, **Turn** and **Size** place and scale the whole door.

Fit your own design

So that nothing passes through the frame or another leaf: **Step out first** moves the leaves out of the wall before they slide, **Extra travel** adds or takes metres from the slide, **Hinge in from the edge** moves the turning point, and **One after the other** delays each leaf.

79

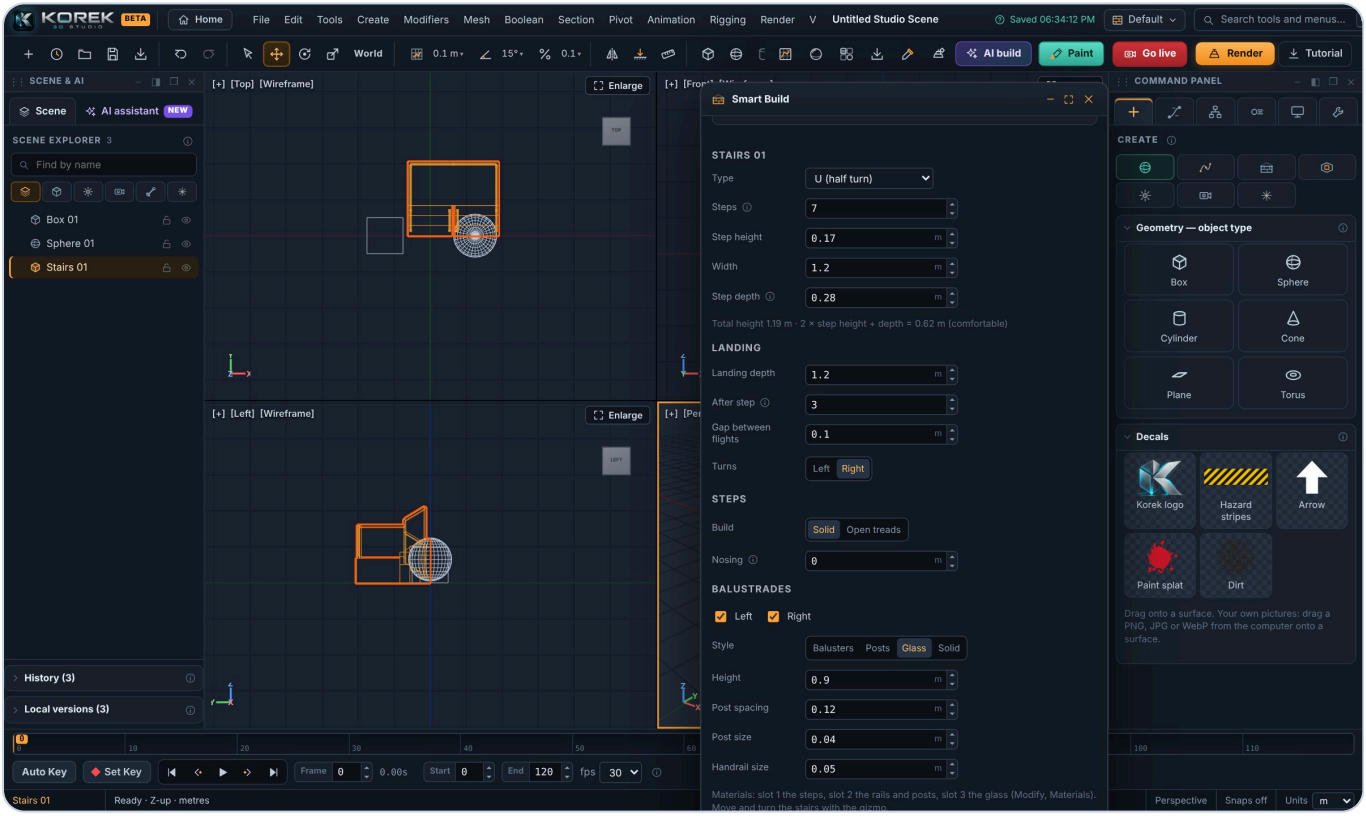
Dynamic stairs NEW

STUDIO · CREATE MENU · **SMART BUILD: STAIRS**

Stairs are a real building element, not a fixed model: change any number and they rebuild at once, with the right number of steps for the height.

SETTING	CHOICES
Type	Straight, Straight with landing, L (quarter turn), U (half turn), Curved, Spiral
Steps	Number of steps, step height, width and depth (the going), nosing
Landing	Its depth and after which step it comes; the gap between the two flights of a U stair
Build	Solid or open treads
Balustrades	Left and right switched on separately; style Balusters, Posts, Glass or Solid, with the spacing

The line under the settings shows the total height and checks the comfort rule: step height up to 0.20 m, and two step heights plus one depth between 0.55 and 0.70 m. It warns when the stair would be uncomfortable. Materials: slot 1 the steps, slot 2 the rails and posts, slot 3 the glass.



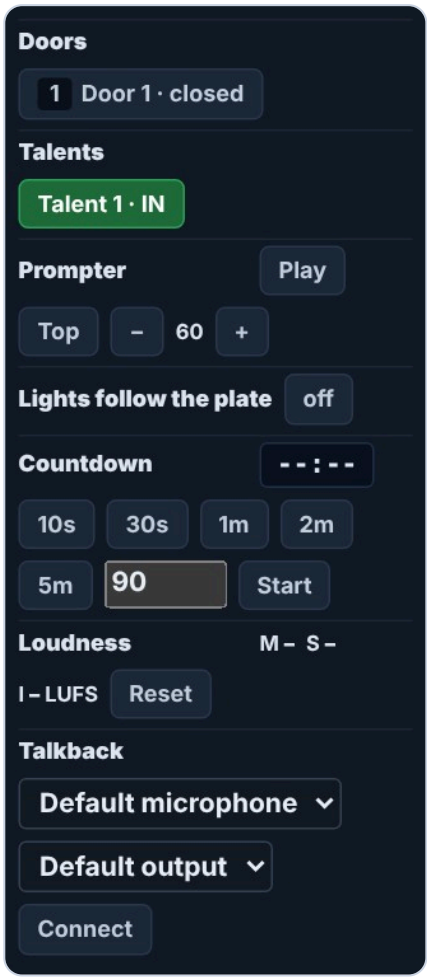
Smart Build: a U stair with a landing and glass balustrades on both sides. The line under Step depth checks the comfort rule.

80

Gallery show control NEW

GALLERY · **SHOW CONTROL**

The Gallery now drives everything that moves in the show from one strip of buttons, and every button is also a rundown and macro action.



Show control in the Gallery: doors, talents, prompter, plate lights, countdown, loudness and talkback.

ROW	WHAT IT DOES
Doors	One button per door, by number and name: opens or closes it.
Talents	Bring each person into the picture or take them out.
Prompter	Play, Pause, Top, slower and faster.
Plate	Play, Pause and Restart the background plate, and the switch for the lights that follow it (chapter 75).
Countdown	10 s, 30 s, 1 m, 2 m, 5 m or your own time, counting down in the Gallery. Also a rundown and macro action.
PTZ	Presets 1 to 8 of the chosen PTZ camera.
Loudness	Momentary, short-term and integrated loudness of the program (EBU R128): aim for −23 LUFS for broadcast or about −14 LUFS online. A limiter keeps loud moments from clipping.

Talkback	Hold **Talk** to speak into the presenter's earpiece over the program sound. Choose the microphone and the earpiece output once.

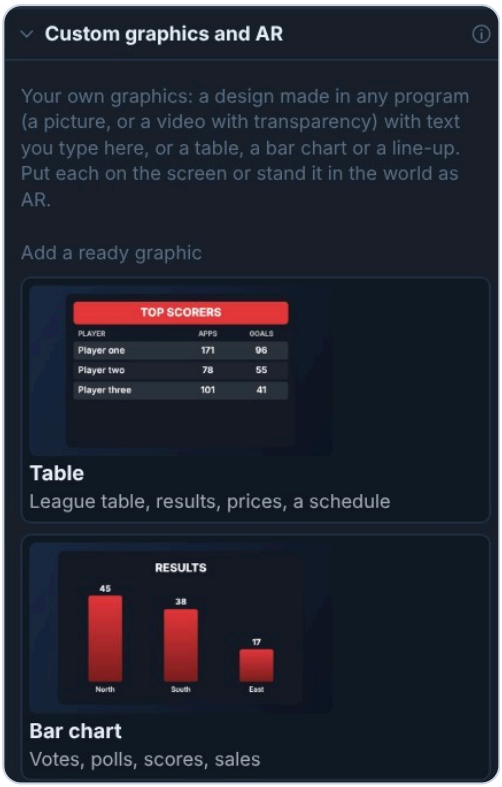
Next to **AUTO**, the **Transition** choice sets how AUTO and Take go to the next shot: cut, mix or camera move.

81

Graphics with picture tiles NEW

SHOW TAB · **CUSTOM GRAPHICS AND AR**

The ready graphics are now picture tiles with their name, so you can see what each one looks like before you add it: Table, Bar chart, Weather, Match-up, Line-up, Your design and 3D object. Click a tile to add it, fill in its text, then size and place it on the preview (chapter 62).



Ready graphics as picture tiles.

82

Flying the free view IMPROVED

`W` and `S` now move along the direction the camera looks, including its tilt, as in a game engine or Unreal's viewport. Tilt the camera down and press `W`: you fly down towards what you see. `A` and `D` stay level sideways, and `E` and `Q` still go straight up and down. Hold `Shift` to go three times faster.

83

USD files NEW

Korek 3D Studio opens USD scenes (.usd, .usda, .usdc and .usdz), Pixar's Universal Scene Description used by Omniverse, Houdini, Maya and Apple's AR Quick Look. It brings in editable meshes with their hierarchy and positions, UVs, normals, and PBR materials (UsdPreviewSurface) with their textures. USD is usually Y up and often in centimetres: the import converts it to Korek's metres and Z up and reports what the file stated. Use File, Import, or drag the file onto the viewport. Animation, skinning and variants are not imported.

GLB stays the best format for moving sets between Unreal Engine and Korek 3D Studio: it keeps PBR materials and textures in one file.

84

New remote commands NEW DESKTOP

The remote API (chapter 32) controls the new parts of the show. Every call needs the key, as before.



The remote, with the Claude connector steps.

CALL	WHAT IT DOES
`/api/mixer?channel=Host&gain=0.8`	A fader of the audio mixer: a microphone by name or number, media, sfx or master. Gain 0 to 2 (1 = unchanged); `mute=on`, `off` or `toggle`.
`/api/video?video=Wall&action=pause`	A video on a material: play, pause, toggle, restart, loop, noloop.
`/api/light?light=Key&action=on&level=0.8`	One light of the set: on, off or toggle, with a level from 0 to 2.
`/api/door?door=1&action=open`	A door by number, name or id: open, close, toggle.

Bitfocus Companion and Stream Deck buttons can call these directly, so a physical button can open the set doors on the presenter's entrance.

85

AI with your own references NEW

AI Render and the AI assistant now take **assets**: the exact furniture, materials, people, logo or look you want, added once with a name, a description and up to three pictures. Tick the ones to use and they go with the request.

In AI Render

Under the render options, **Your assets**: add an asset, tick up to six, and say in the prompt where they go (for example "the Oak sofa by the window"). The first pictures go to the AI with your render; the rest are described in words.

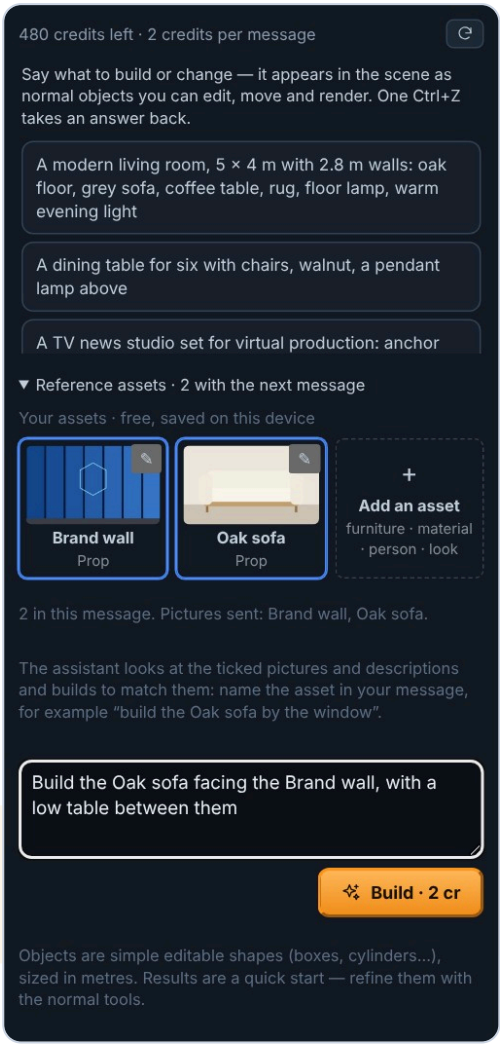
In the AI assistant

Open **Reference assets** above the message box, tick up to four, and name them in your message. The assistant looks at the pictures and builds to match their proportions, parts, colours and materials, from simple editable shapes.

One library everywhere

The same assets appear in AI Render and the AI assistant in Korek 3D Studio, and in AI Render and Video on ortho2d.com. They are saved in your browser, free: nothing is uploaded until you make a render, a video or a request.

> Assets are kept per browser and per address. ortho2d.com and www.ortho2d.com, another browser, a private window and the desktop app each have their own library.



The AI assistant with two reference assets ticked.

86

Saving recordings NEW

WHERE	RECORD AND WATCH	SAVE TO THE COMPUTER
Desktop app	Free	Free, straight away. Live streaming is in the desktop app.
Browser (ortho2d.com)	Free	With an Ortho2D plan: every started 10 minutes count as one download of the plan. Without a plan: one single download ($2) saves one recording.

After you stop recording in the browser, press **Download recording**. The app asks ortho2d.com first; sign in if asked. The recording waits on the page while you buy a single download in a new tab.

Virtual Production in the browser runs on ortho2d.com and checks in with it when it opens. After that it keeps working without a connection for up to 30 days. The desktop app does not need to check in.

PART 11

New in 1.14

Korek 3D Studio for film: the keyed people with their matte in one ProRes 4444 file, the clean background in 10-bit, a depth pass in EXR and every camera on its own, all frame for frame with the master. Plus a cleaner talent inside Unreal, and Claude building your set and running the show.

- Film post: layers, depth and ISO
- Bringing the layers into post
- Talent inside Unreal: solid talent
- Unreal timing and sync
- Build and run your set with Claude
- Connect your tracking system

87

Film post: layers, depth and ISO in film quality NEW DESKTOP

WHERE: **VIRTUAL PRODUCTION › OUTPUT AND PRO RECORDING**

With a pro recording format chosen, every take writes the live composite *and* its parts next to it, so post can rebuild, re-key or re-grade the shot without shooting again. Every file has the same frame count, the master's colour and the studio timecode.



Output: ISO, layers for post and the depth pass, ready for film quality.

Set it up once

1. **Pro recording**: choose **Apple ProRes 422 HQ**, **ProRes 4444** or **Avid DNxHR HQX**, and the folder.
2. **Output**: tick **Also record separate layers for post**. Keep **Background** and **People and matte** ticked.
3. Tick **Depth pass (EXR)** for the depth of every pixel.
4. Tick **Also record each camera input on its own (ISO)** for the clean camera pictures.
5. The line under the boxes says **Film quality** when everything is ready. Press **Record** as usual.

The files of one take

FILE	WHAT IS IN IT	FORMAT
korek-master-… mov	The program as it went on air, with sound.	The format you chose, 10-bit
… _background.mov	The set without the people. With **Their shadows in the background**, their shadows and floor reflections stay in it.	The master's format, 10-bit
…_people.mov	The keyed people over black, with their matte as the alpha channel. Things of the set in front of them already cut the matte.	Apple ProRes 4444 with alpha
…_depth (folder)	One picture per frame: the distance of every pixel from the camera, in metres. The sky reads as the far distance.	OpenEXR, 32-bit float
…_iso-(name).mov	Each camera input as it arrives, before the key, for up to 4 inputs. No sound: it is in the master.	ProRes 422 HQ or DNxHR HQX

The background and people layers include the lens, depth of field and post process like the master, but not the graphics, so titles can be changed in post.

Every layer is one more picture to draw and one more file to write. Use a strong graphics card and a fast SSD, and test a take before the shoot. When you stop, Korek says how many pictures were dropped, if any. In the browser the layers are saved as 8-bit video files.

88

Bringing the layers into post NEW

The people file is **premultiplied** (colour over black). Tell your software so, or a dark fringe shows round the edges.

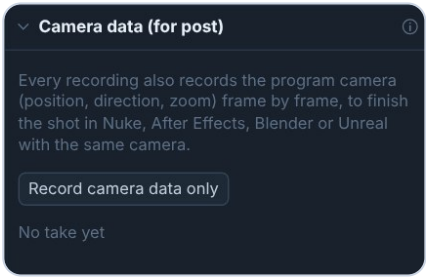
SOFTWARE	HOW
Nuke	Read the people file and tick **premultiplied**. Merge (over) onto the background. Read the depth folder as an EXR sequence for ZDefocus or fog.
DaVinci Resolve	People on the track above the background. Clip attributes › Alpha mode: **Premultiplied**. The depth sequence works with the Fusion page.
After Effects	Interpret footage › Alpha: **Premultiplied, matted with black**.
Premiere Pro	People on V2, background on V1. ProRes 4444 alpha is read as it is.

A typical film workflow

1. Shoot with the live composite: the director and the client see the final shot on set.
2. Cut with the master files.
3. For hero shots, rebuild in Nuke from the background and the people, re-key from the ISO if needed, and use the camera data (Nuke .chan, glTF) to add 3D in post with the same camera.
4. Use the depth pass for depth of field, fog or haze in post.

Genlock

For a multi-camera shoot with SDI gear, use **SDI output** with an AJA or DeckLink card connected to the house reference (black burst or tri-level). The status line shows **locked** when the output is in sync with the studio, and **NOT LOCKED** if the REF cable is missing.



Camera data: the camera of every take, for Nuke, Blender and Unreal.

89

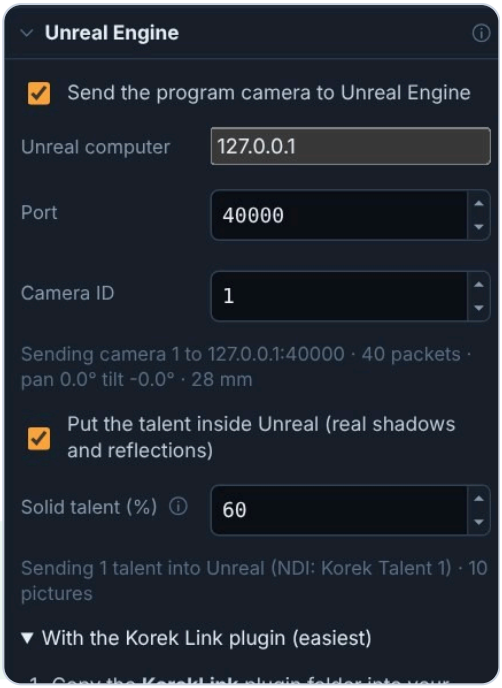
Talent inside Unreal: solid talent NEW DESKTOP

WHERE: **VIRTUAL PRODUCTION › UNREAL ENGINE**

Unreal draws the talent card as either solid or see-through, nothing in between. Parts of the key that are a little transparent (green spill on dark clothes, a soft key) would show as holes in Unreal. Korek now sends Unreal a cleaned picture: solid inside the person, with only a thin soft edge.

- **Solid talent (%)**, under **Put the talent inside Unreal**: 60 by default. Raise it if you still see holes in the person. Lower it if the hair edges look hard.
- The green-screen shadow (**Keep shadows**) and light wrap are left out of the picture for Unreal, because Unreal makes its own shadow and light.

> Check the key in Korek first. A cleaner key in Korek (Similarity, Softness, Spill, a clean plate) always gives a better person in Unreal.



The Unreal Engine panel with the talent sent into Unreal.

90

Unreal timing and sync NEW

With a virtual camera you do not need a tracking system: Korek sends the camera to Unreal, Unreal renders, and the picture comes back over NDI. This round trip takes about 3 to 6 frames, so the whole picture follows your controls a little late. That is normal.

- The talent and the set come back in the same Unreal picture, so they stay together.
- If the talent seems to smear or drift during fast turns, switch off Unreal's motion blur: **Project Settings › Rendering › Motion Blur**, or a Post Process Volume with Motion Blur Amount 0.
- Use a lower output size in the plugin (1920 × 1080) and the same computer, or a wired network, for the shortest delay.
- A real moving camera needs camera tracking (FreeD), so the virtual camera follows the real one.

91

Build and run your set with Claude NEW DESKTOP

WHERE: **VIRTUAL PRODUCTION › REMOTE CONTROL AND API**

The **Korek 3D Studio connector for Claude** lets Claude build your virtual set and run the live show, by asking in plain words. It runs on your own Claude account.

1. Download **korek-3d-studio.mcpb** from ortho2d.com/studio-desktop.
2. In Korek: **Remote control and API** › **Start the remote**. Copy the address with its key (http://127.0.0.1:7351/?key=…).
3. Open the file with the Claude desktop app and install the connector. Paste the address as **Korek remote address** in the connector's settings.
4. Ask in plain words, for example: "cut to the close shot", "put the lower third up", "run the opening macro". Claude asks before it records or goes live.



Remote control, with the steps for the Claude connector.

Build the set

Describe the set and Claude builds it with real Smart Build pieces: rooms and walls with doors and windows, floors and ceilings (with hidden LED), stairs, columns, set pieces, textured materials from the Materials Library, lights and camera shots. It then looks at the program picture and fixes what is wrong. Everything stays editable in Korek.

- "Build an open news set, 9 by 6 metres, 3.4 metres high, with two big windows in the back wall."
- "Add a dark oak floor, a white gloss anchor desk and a soft key light on the presenter."
- "Make a wide shot and a close shot of the desk, then show me the wide shot."

> Each build is one step: press Ctrl+Z in Korek, or ask Claude to take the last build back. Building needs Korek 3D Studio desktop 1.15 or newer.

Run the show

Take shots, cut, change graphics and values, play media, run macros, lights and the prompter, and start the recording or the stream (Claude asks you first).

> Claude talks only to Korek on your computer, with your key. Stop the remote and nothing can control Korek.

92

Connect your tracking system: Mo-Sys, stYpe and others NEW

DESKTOP

WHERE: **VIRTUAL PRODUCTION › CAMERAS › CAMERA TRACKING** AND **TRACKED CAMERAS AND CRANES**

Korek reads **FreeD** (also called **D1**), the standard camera tracking format: each camera's position, rotation, zoom and focus, with a camera ID. Almost every tracking system sends it, often next to its own format, so one tracker can feed Korek and another system at the same time.

Step by step

1. **The address of the computer where Korek 3D Studio is installed:** on that computer press the Windows key, type **cmd**, press Enter, type **ipconfig** and note the **IPv4 Address** (for example 10.10.10.169).
2. **On the tracking system**, add an output: Destination IP = that address, Port = for example **8003**, Protocol = **FreeD** (or **D1**), output **On**, and a camera ID (1, 2, 3…).
3. **In Korek**: Camera tracking › **FreeD (UDP)**, and the same **UDP port**. Avoid 40000 when you use the Unreal link.
4. Move the camera: the line under the settings shows pan, tilt and mm changing.
5. Match the set: **Lens wide / tele**, **Origin** and **Turn** until the floor stays in place during a pan, then **Video delay** until person and set move together.

System by system

SYSTEM	WHAT TO CHOOSE ON IT
Mo-Sys StarTracker	UDP Out: on a free line set the Destination IP and Port, press **Protocol** until it shows **D1** (FreeD), Enable On. Lines that feed other systems can stay on MoSys F4. Run the zoom and focus rings through their full range once.
stYpe (RedSpy, StypeKit)	Add an output with the FreeD protocol, Korek's IP address and port, and a camera ID.
Ncam and other systems	Check that the system offers a FreeD output (some need an add-on or a converter), then send it to Korek's address and port.
PTZ cameras	Switch on FreeD output in the camera's menu or web page, with Korek's address and port.
No tracking system	Optical tracking: printed markers and the camera's own picture.

Several tracked cameras

Give each camera its own camera ID on the tracker (all can use the same port). In **Tracked cameras and cranes**, press **+ Tracked camera** for each one and set its Camera ID, Its picture, where it stands, its lens and its video delay. Switch between them like any shot; Unreal follows the camera on air.

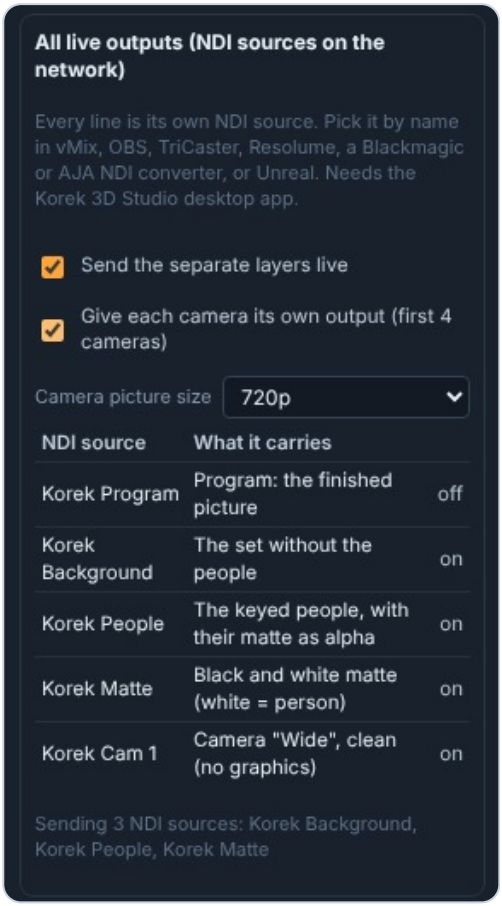
No tracking arriving? Check that the Destination IP is exactly the Korek computer's address and the port matches, that the tracker sends FreeD / D1 (not its own format), that Korek 3D Studio is allowed through the Windows firewall (Private and Public), and that both computers are on the same network.

93

All live outputs: layers and cameras as their own feeds NEW

DESKTOP

Under **Output** there is one list of every live picture that leaves Korek. Each line is its own NDI source on the network. Pick it by name in vMix, OBS, TriCaster, an NDI to SDI converter or Unreal.



Output: one list of every live picture Korek sends.

NDI SOURCE	WHAT IT CARRIES	SWITCH IT ON WITH
Your NDI name	Program: the finished picture	NDI output
Korek Background	The set without the people	Send the separate layers live
Korek People	The keyed people, with their matte as alpha	
Korek Matte	Black and white matte (white = person)	
Korek Cam 1 to 4	Each camera's own finished picture, clean, also when it is not on air	Give each camera its own output

Before you start

- Install the free **NDI Tools** on the Korek computer, once, then restart Korek 3D Studio. Download them at ndi.video/tools, or click **Get the free NDI Tools** in the All live outputs box. Korek uses the NDI software on your computer. No NDI program has to stay open.
- The program that receives the pictures must be on the same network as the Korek computer.

- Camera tracking does not use NDI. The tracking data comes straight from the tracking system to Korek (chapter 92).

Switch the outputs on

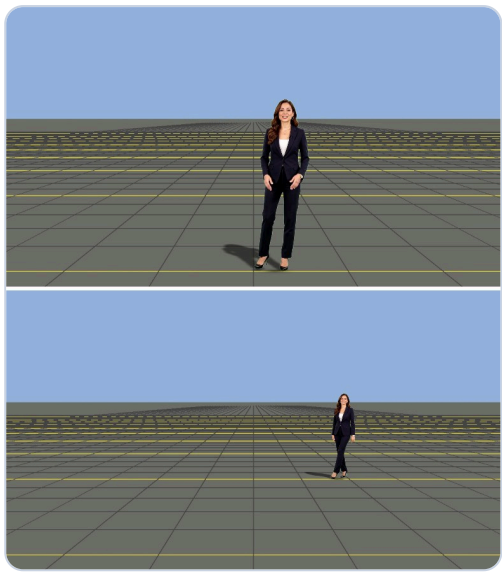
1. Open **Output** and find **All live outputs**.
2. Tick **Send the separate layers live** for the three layer feeds. With the program that makes four separate feeds.
3. Tick **Give each camera its own output** for the first four cameras, and choose the **Camera picture size** (540p, 720p or 1080p).
4. Open the **Gallery**: every output has its own tile in the multiviewer, marked **OUT**.
5. Check it: open **NDI Studio Monitor** (part of NDI Tools) on any computer on the network and choose the source by name. If the picture shows there, every other program sees it too.

> Every extra output is one more picture to draw. Start with the layers or two cameras at 720p, watch the frame rate, then add more. To record the same layers as files in film quality, see chapter 87.

94

Walk inside a flat video (16:9 plate) NEW

For a plate filmed with a locked camera, such as a street or a room. Korek rebuilds the camera that filmed the plate, so its virtual floor lies exactly on the plate's ground.



The person stands on the plate's own ground and gets smaller with distance.

1. **Background** › **Video input**. Under **Walk inside a flat video** click **Choose the plate video (any format)**. The desktop app opens MP4, MOV, MKV, WebM, MXF, AVI and TS files. In the browser, choose an MP4 or WebM under **Input**.
2. Under **Walk inside a flat video**, type how the plate was filmed: **Camera height** (the lens above the ground), **Horizon** (where the horizon is in the picture, from the top; 50 % is the middle) and **Lens** (focal length, as on a full-frame camera).
3. Click **Match the camera to this plate**. Korek makes the camera **Plate camera**, puts it on air, lays an invisible shadow floor on the ground and stands your people on it.
4. Place the person with **Move in picture**. Away from the camera they get smaller and rise towards the horizon, as in the plate.
5. Set **Light from** to the plate's sun so the shadow falls the same way, use the light match in Key for the colour, and **Reflection** for a wet or polished ground.

> Video not showing? Open **Set (3D scene)** and untick **Show the set**, so the 3D set does not cover the plate. Feet floating or sinking as the person walks away? Change the camera height a little. Person leaning against the perspective? Move the horizon. Keep the plate camera still: a flat video has no other side to look at.

95

Any video as plate or 360 background, and other tracking formats NEW DESKTOP

The desktop app plays MP4, MOV, MKV, WebM, MXF, AVI and transport stream files in H.264, H.265 (HEVC, also 10-bit), VP9, ProRes and DNxHR, also in very high resolution. For a 360 video that does not play, open the Panorama panel and use **360 video from disk (any format)**.

A tracker that only sends its own format

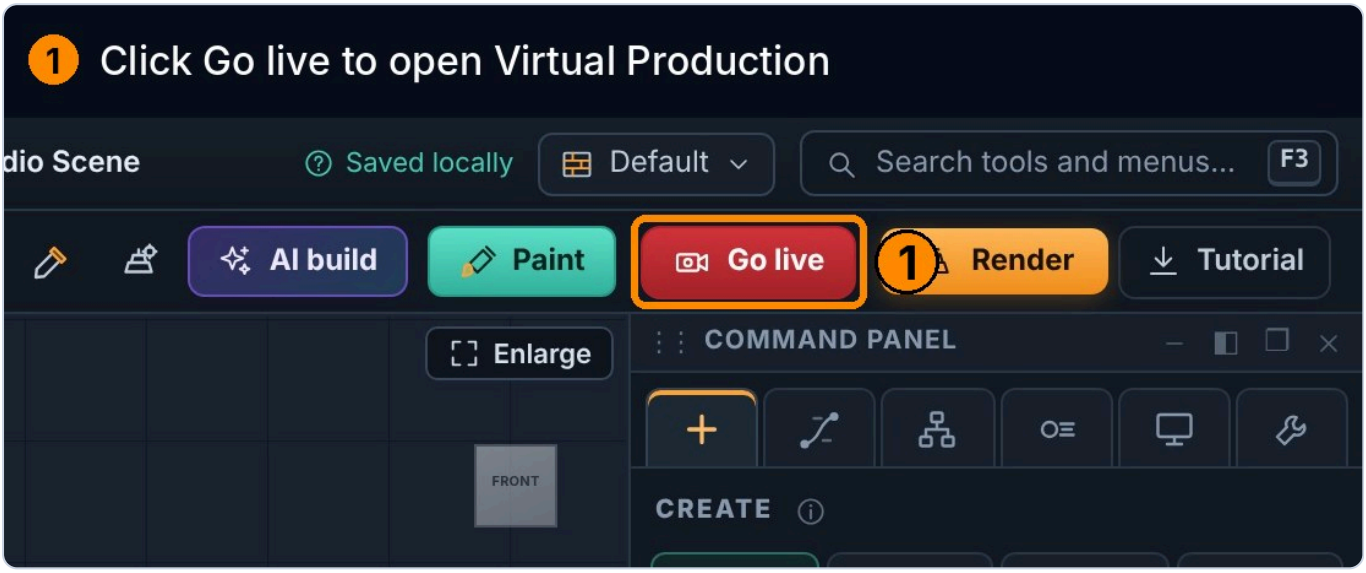
When packets arrive that are not FreeD, the **Tracking monitor** says so and names the format when it knows it (for example MoSys F4). First switch the tracker to FreeD / D1. If that is not possible, click **Capture these packets to a file**, move the camera for a few seconds (pan, tilt, zoom, focus) and send us the file with the values your tracker showed. We use it to add your format.

96

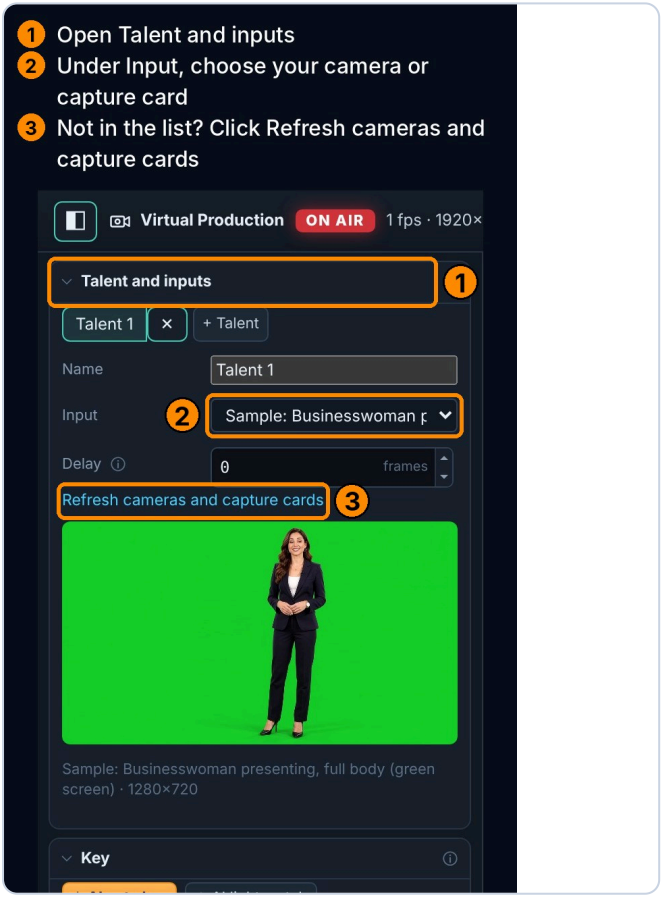
Where to find it: picture guide NEW

Each picture shows one task. Follow the orange numbers in order. Some buttons appear only in the desktop app.

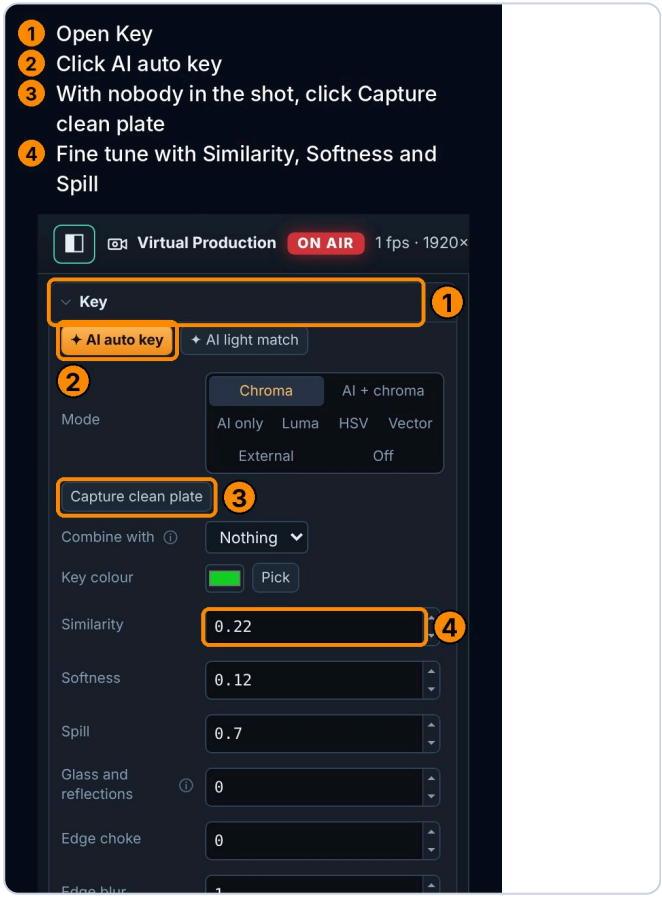
1. Open Virtual Production



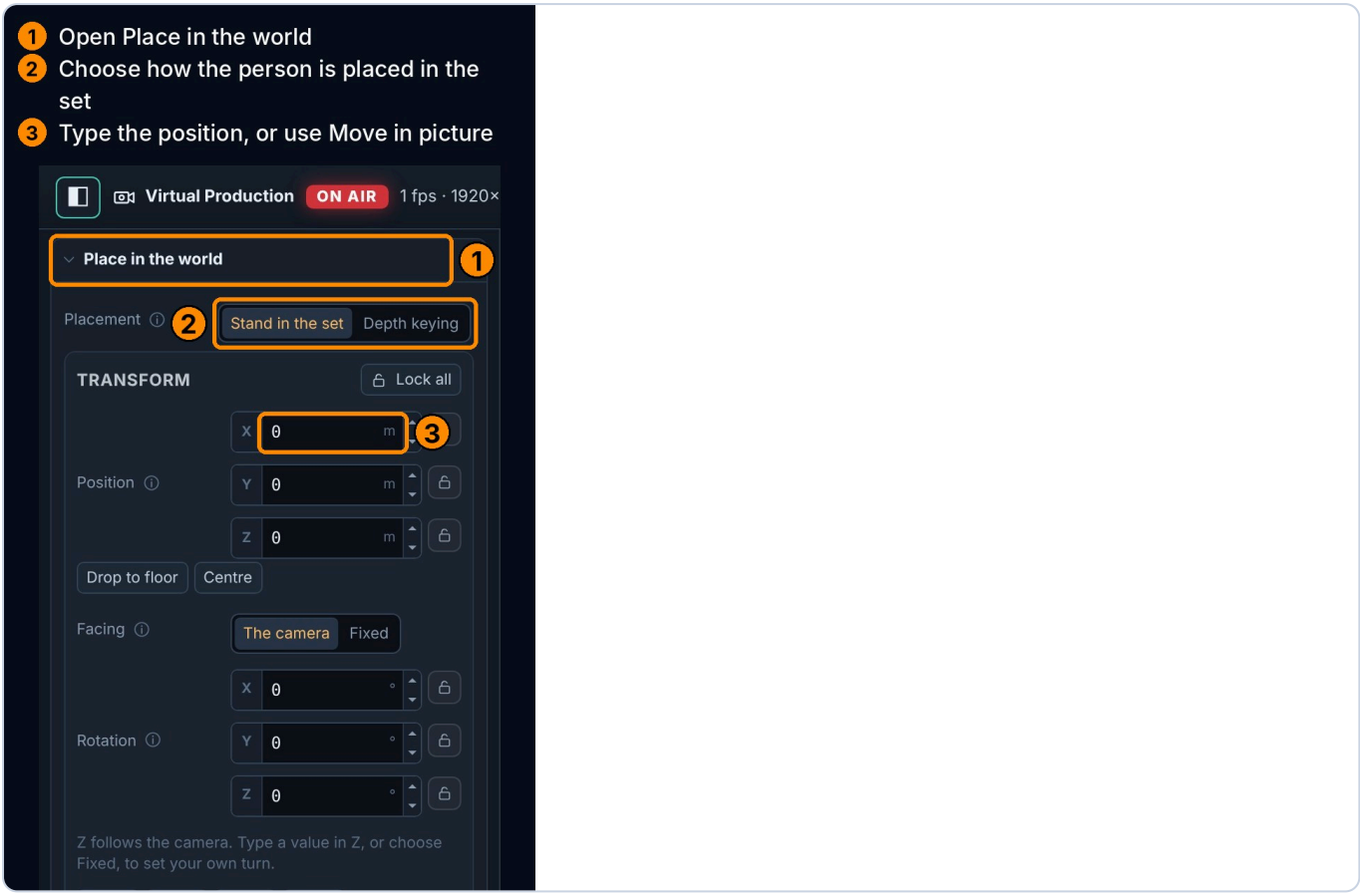
2. Connect your camera



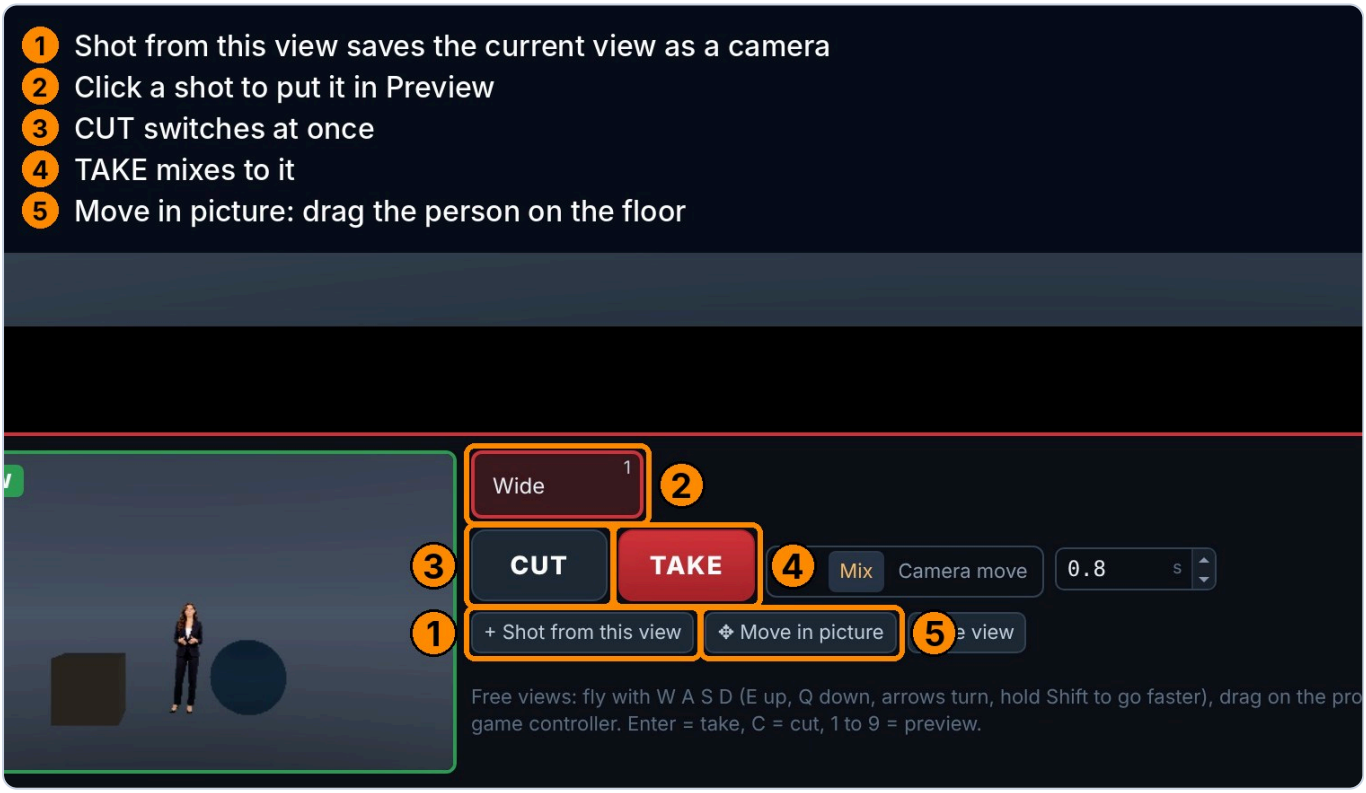
3. Key the green screen



4. Place the talent in the set

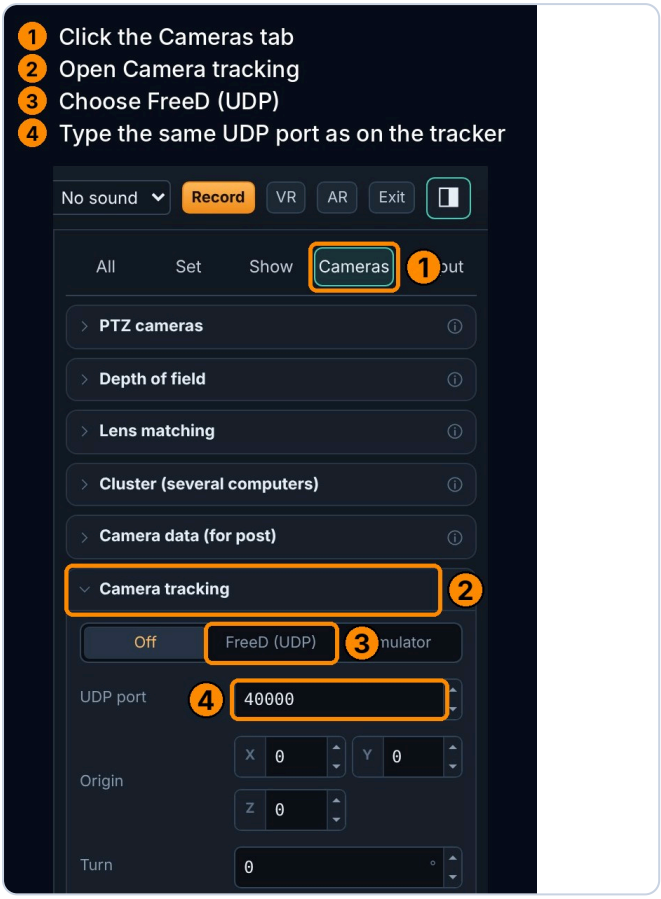


5. Cameras and shots



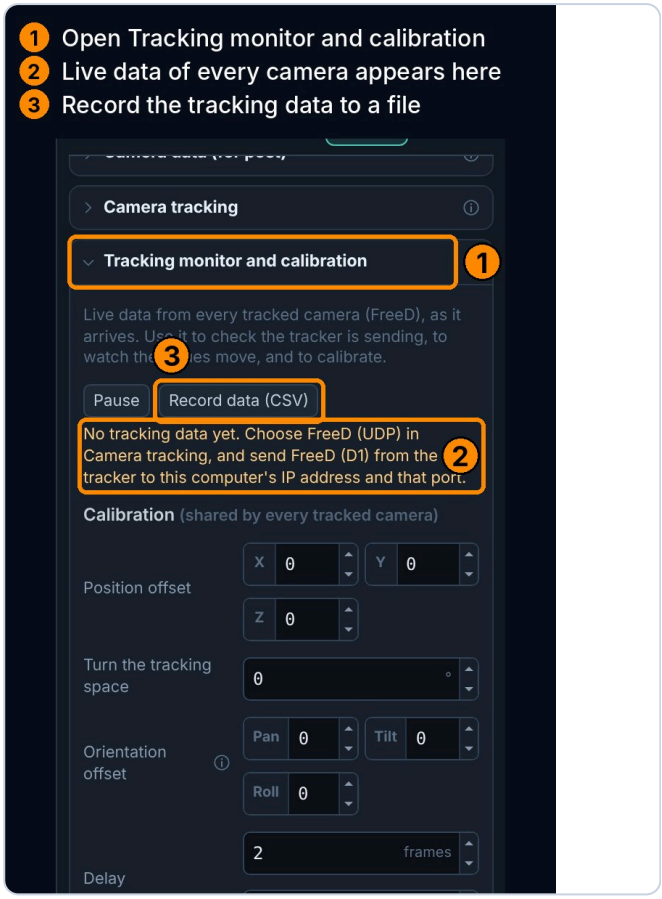
6. Connect camera tracking

1. Click the Cameras tab
2. Open Camera tracking
3. Choose FreeD (UDP)
4. Type the same UDP port as on the tracker



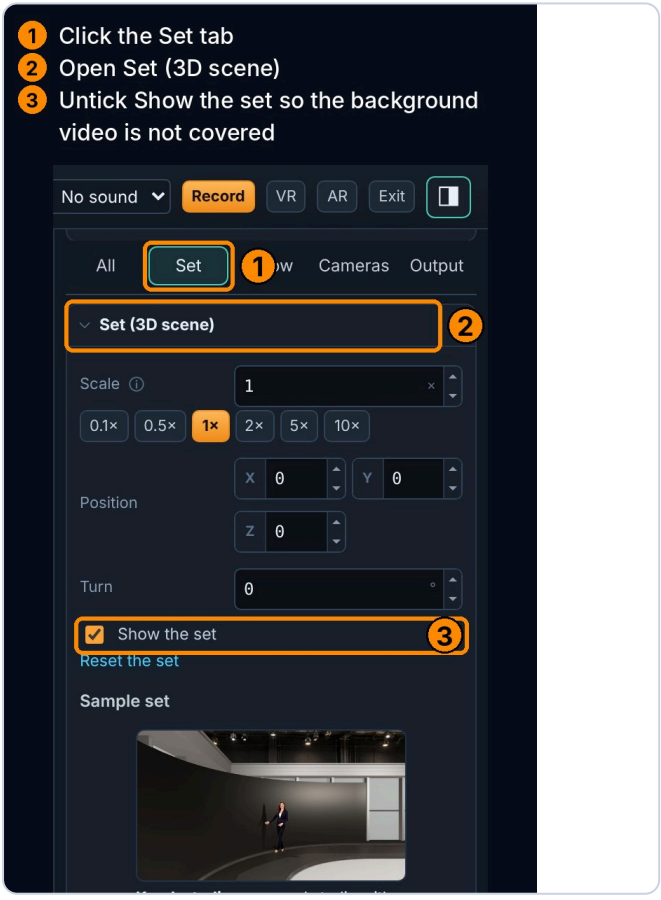
7. Tracking monitor

1. Open Tracking monitor and calibration
2. Live data of every camera appears here
3. Record the tracking data to a file



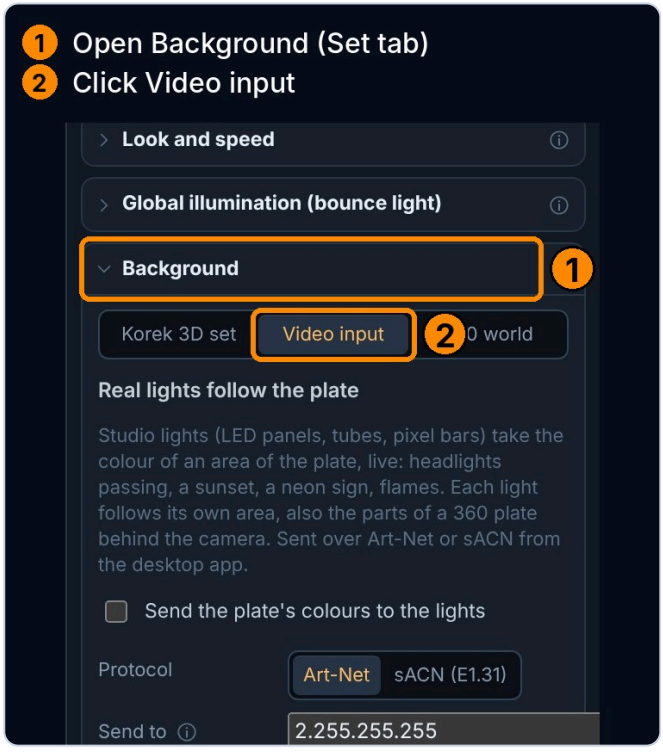
8. Hide the 3D set

1. Click the Set tab
2. Open Set (3D scene)
3. Untick Show the set so the background video is not covered



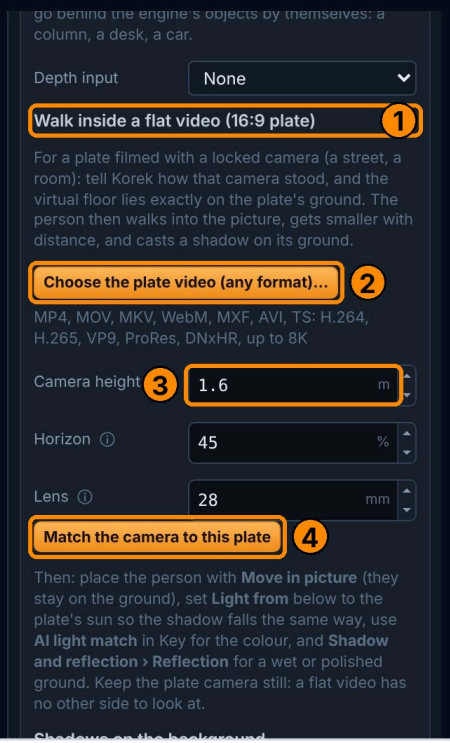
9. A video as the background

1. Open Background (Set tab)
2. Click Video input



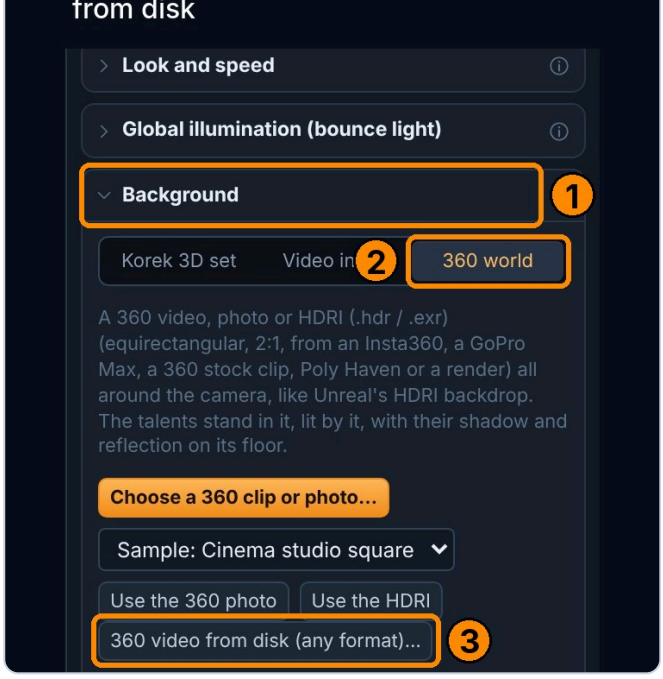
10. Walk inside a flat video (16:9 plate)

1. Walk inside a flat video (16:9 plate)
2. Choose the plate video (any format)
3. Type camera height, horizon and lens
4. Click Match the camera to this plate



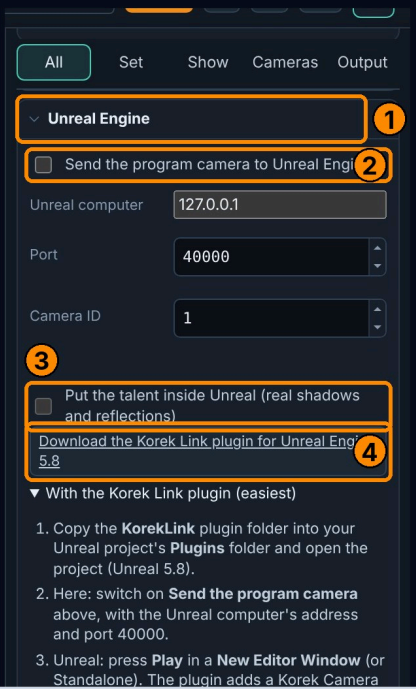
11. 360 world and 360 video

1. Open Background
2. Click 360 world
3. For a 360 video in any format: 360 video from disk



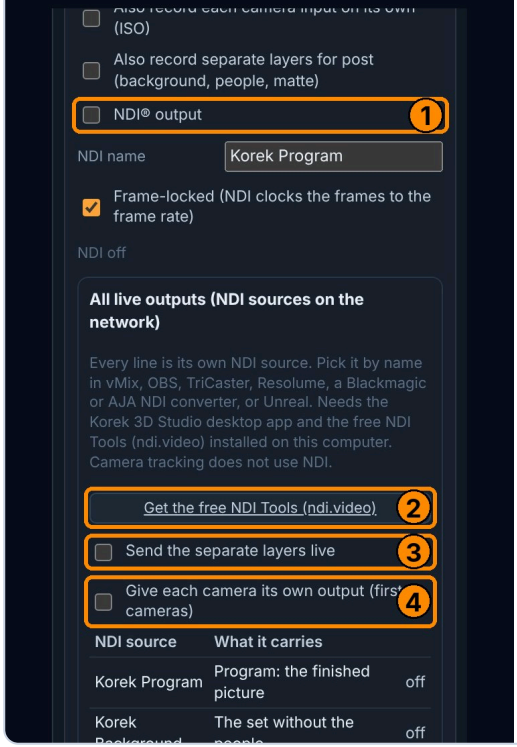
12. Unreal Engine with Korek Link

1. Open Unreal Engine (Set tab)
2. Tick Send the program camera to Unreal Engine
3. Optional: put the talent inside Unreal
4. Download the Korek Link plugin for Unreal 5.8

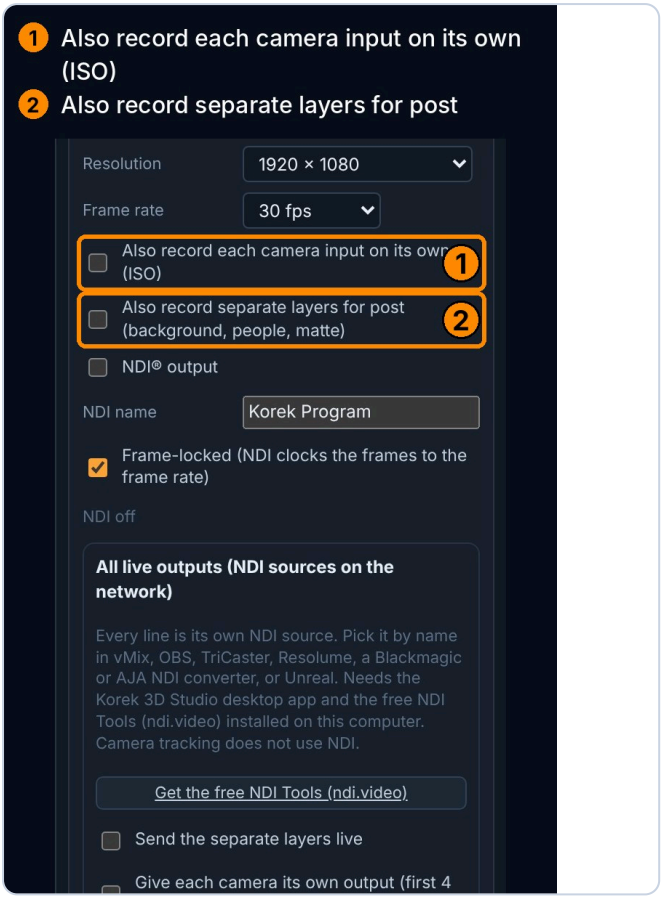


13. Live outputs (NDI)

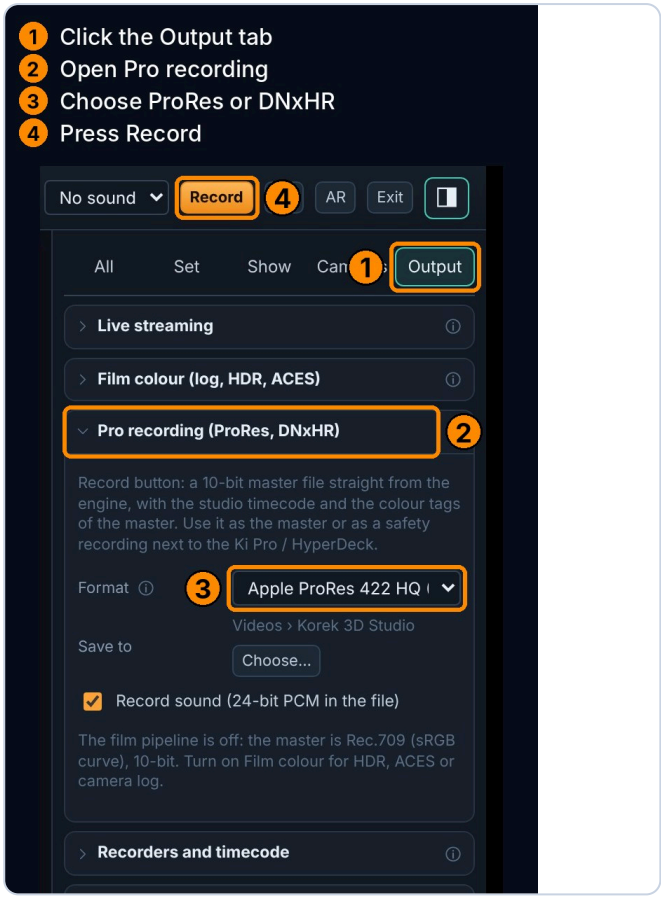
1. NDI output: the finished program
2. No NDI yet? Get the free NDI Tools
3. Send the separate layers live
4. Give each camera its own output



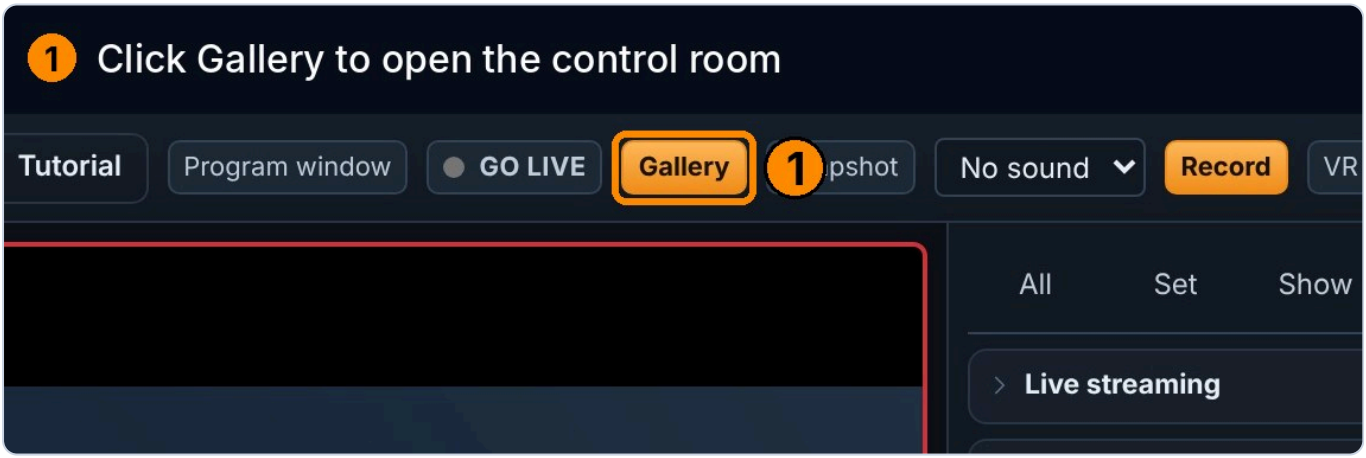
14. Record the layers and ISO



15. Pro recording (ProRes, DNxHR)



16. Open the Gallery



PART 12

Engineering reference

For the engineer who installs, integrates and signs off the system: how a frame is made, the coordinate and colour conventions, every timing and sync path, the keyer and tracking maths, every network port and protocol, the performance budget, and the limits you must design around.

- Signal flow of one frame
- Coordinates, units and spaces
- Timing, latency and sync
- The colour pipeline
- Keyer internals
- Tracking, lens and projection
- Placement and depth maths
- Outputs and recording
- Ports and protocols
- HTTP API reference
- Performance engineering
- Project data and safety
- Limits and design rules
- Commissioning checklist

E1

Signal flow of one frame

Korek renders the Program on the GPU once per output frame. Everything below happens inside that frame, in this order. Knowing the order tells you where each control acts and why some combinations cost more than others.

1 · Inputs
Newest picture of every camera, NDI, SDI, guest and clip is taken. Per-input delay rings are advanced.

2 · Pose
Shot pose: switcher, transition, tracking (FreeD / optical, delayed), riding objects, Set move.

3 · Scene
Animations, video screens, light cues, matte objects, AR graphics, splats, GI update.

4 · People
Each talent card placed (world, depth key, FreeWalking), keyed, colour corrected, its shadow and reflection twins.

5 · Render
Set and people in linear light (half float when the film pipeline is on), with shadows, planar reflections, MSAA.

6 · Post
AO, height fog and light shafts, bloom, grade and colour wheels, lens effects.

7 · Lens
Lens distortion (rendered over-scan, then bent), depth of field, SMAA / FXAA.

8 · Master
Graphics composed in linear light, then encoded once to the master curve and gamut.

9 · Outputs
Program window, NDI, SDI (fill, or fill + key), streaming, recording, layers, ISO.

10 · Side work
Every 3rd frame depth keying, every 4th body relief and preview, every 6th feet lock, every 30th light probe.

11 · Control
Tally, RossTalk, MOS, HTTP API, voice and macros act between frames, through the same command path.

Two paths exist for steps 5 to 8. The **direct path** renders straight to the screen in 8-bit display colour and is the fastest. The **film path** renders to half-float targets and keeps linear light to the end; it switches on by itself when anything needs it: Film colour, depth of field, pro recording, SDI without keying, post process, or anti-aliasing other than plain MSAA.

> An LED wall section, a curved wall's sections, a mix transition and the layers for post are additional renders of the same scene in the same frame. Each one costs close to a full frame of GPU time (section E11).

E2

Coordinates, units and spaces

CONVENTION	VALUE
Units	Metres everywhere, degrees in the panels. Imported files are converted at the border and their source units are kept on the asset.
Axes	Right-handed, **Z up**. The floor is the XY plane at Z = 0. A camera with no turn looks along +Y.
Turns	Turn (yaw) is about Z, positive anticlockwise seen from above. Talent cards use the order Z, X, Y (turn, then tilt, then lean).
Studio space	The real stage: talents, tracked cameras, matte objects, the LED wall, AR graphics and the FreeWalking camera live here.
Set space	The 3D scene. The Set section moves, turns and scales it inside studio space without moving the people or the tracking.
Talent card	A plane standing on its bottom edge, normal −Y at turn 0. Height = the picture height in metres; width follows the camera's aspect.
Splat worlds	Ride with the Set. Most captures are Y-down: turn X = −90° stands them up.

Survey the real stage once: mark the floor origin and the +Y direction with tape, and set every tracker, the LED wall centre and the FreeWalking marks against that one origin. Most "it slides" problems are two different origins.

E3

Timing, latency and sync

Output rate and pacing

The output frame rate is 23.976, 24, 25, 29.97, 30, 50, 59.94 or 60. With pacing **AUTO** Korek renders once per output frame even when the screen refreshes faster (a 120 Hz monitor with a 50p show renders 50 times, not 120). **EVERY** renders on every screen refresh, for the smoothest local monitor at the cost of GPU time.

Clocks

PATH	CLOCK
Screen	The display refresh, paced to the output rate.
NDI out	With frame-locked on, NDI clocks the frames to the exact output rate (rational rates such as 30000/1001).
SDI out	The card's clock, locked to house reference (black burst or tri-level) when **Reference = External**, otherwise free-running. A late frame repeats the last one; it never tears.
Timecode	Read from a Ki Pro or HyperDeck and kept running between readings; it stamps camera data and recordings.

Latency matching

Video and tracking arrive at different times. There are three independent delays, all in whole frames:

CONTROL	WHERE	USE
Tracking delay	Camera tracking, calibration	Holds the virtual camera back so it moves with the camera picture (default 2 frames).
Input Delay (0 to 15)	Talent and inputs	Holds one camera input back, to wait for a background that arrives later (Unreal over NDI).
Hold back (background)	Background, video input	Holds the background back when it arrives earlier than the camera.

1. Pan the real camera fast across a sharp vertical edge in the set.
2. Raise the tracking delay until the virtual set stops leading or lagging the person.
3. With an external background, adjust Input Delay or Hold back until the person and the background move as one.

> Each frame of delay held in Korek adds one frame to the end-to-end latency. Measure the total on a clapper or a flash before a live show with an IFB or a talkback return.

E 4

The colour pipeline

On the film path every calculation happens in scene-linear light with Rec.709 primaries. Inputs are decoded into it, the set renders into it, and the master is encoded from it exactly once.

STAGE	WHAT HAPPENS
Camera in	Each talent input is decoded from its own curve and gamut: sRGB, Rec.709, HLG, PQ, ACEScct, ARRI LogC3 / LogC4, Sony S-Log3, Blackmagic Film Gen 5, DaVinci Intermediate. Gamuts: Rec.709, Rec.2020, AP1, AWG3, AWG4, S-Gamut3.Cine, BMD WG Gen 5, DaVinci WG.
Key	The key works on the camera picture as delivered (gamma-encoded), so screen colours keep their usual numbers.

Talent colour	Exposure (stops), saturation, white balance, then the talent's colour correction (E4.1), then light wrap.
Set	Physically based materials and lights, shadows, reflections, bounce light.
Post	Exposure, white balance, highlights and shadows, contrast in stops, lift / gamma / gain, saturation and vibrance, then the Program colour wheels.
Master out	sRGB, BT.1886 (2.4), Rec.2100 HLG or PQ (peak 400 to 10,000 nits), ACEScct, or a camera log, to cut with the camera's own footage.
LED / output LUT	RGB gains and a 3D LUT (.cube), on the LED wall output only or on everything, with a strength mix.

E4.1 · The colour corrector, exactly

The same maths runs for a talent and for the Program. It works on a video-like copy, `v = L^(1/2.2)`, and returns to linear light at the end:

1. **Gain, lift, offset:** `v = v·gain + lift·(1 − v) + offset`, per channel. A wheel's puck adds a colour: red at 0°, green at 120°, blue at 240°, ±0.3 for lift and offset, ±50% for gain.
2. **Contrast** around the pivot: `v = (v − pivot)·contrast + pivot` (pivot default 0.435).
3. **Gamma:** `v = v^(1 / 2^(m + puck·0.6))`.
4. **Colour bars:** the pixel's hue is found on the colour circle; each bar weighs it by distance from its centre (Red 0°, Skin 25°, Yellow 60°, Green 120°, Cyan 180°, Blue 240°, Magenta 300°) with a smooth fall-off over its width. Greys (low colour) are left alone. The weighted hue turn, saturation and brightness changes are applied together.
5. **Hue and saturation** of the whole picture, around its brightness, which a hue turn keeps.
6. **Tints:** shadow tint below the balance point, highlight tint above it, whole-picture tint; each keeps the brightness of the pixel.

A neutral grade is not compiled into the shader at all: leaving the corrector neutral costs nothing.

E 5

Keyer internals

Five modes share one finishing stage: **Chroma**, **AI** (person segmentation, no screen needed), **Hybrid** (AI shape, chroma edges), **External** (a hardware keyer's key signal on a second input) and **None**.

Chroma key

1. Distance in BT.709 chroma: `Cb = (B − Y)/1.8556, Cr = (R − Y)/1.5748`, distance = the length of the difference from the key colour's (Cb, Cr). Brightness does not count, so shadows on the screen still key.
2. Alpha = smooth step from **Similarity** to Similarity + **Softness**.
3. **Glass and reflections** mixes in a colour-difference alpha: how much of the screen's dominant channel is missing, with a 15% veil for uneven light. Glass, smoke, hair and motion blur keep their transparency; what the camera saw minus the screen behind it stays as the object's own light.
4. **Choke** erodes (positive) or grows (negative) the matte; **Edge blur** softens it.

5. **Spill** removes the key colour's chroma from the pixel along the key direction only, keeping its brightness.
6. **Clean plate**: every pixel is keyed against the empty backdrop as captured, which removes uneven light; **Keep shadows** brings the talent's real floor shadow back.

Finishing (all modes)

CONTROL	RANGE	EFFECT
Cut the edge	0 to 6 px	Erodes the outline after the key: removes the green line.
Soften the edge	0 to 4 px	Soft fall-off inwards after the cut.
Edge colour	0 to 1	Takes the screen colour out of the soft edge pixels, also for the AI key.
Hair detail	0 to 1	AI and hybrid: fine strands at the outline come from the screen colour, not the AI's rougher shape.
Clean the background / Fill the person	0 to 0.9 / 0.1 to 1	Matte black and white points.

The finishing samples are compiled in only while one of them is used. The keyed card is drawn premultiplied, and in the film path its alpha carries (1 − coverage) so the master knows where the people are for fill + key and the layers.

E 6

Tracking, lens and projection

FreeD (type D1)

BYTES	FIELD	SCALING
0	Message type	0xD1
1	Camera ID	0 to 255 (several cameras or a crane on one port)
2 to 10	Pan, tilt, roll	signed 24-bit, degrees × 32768
11 to 19	X, Y, Z	signed 24-bit, millimetres × 64
20 to 25	Zoom, focus	unsigned 24-bit raw encoder counts
28	Checksum	0x40 minus the sum of bytes 0 to 27, modulo 256; a bad checksum drops the packet

UDP, default port 40000. Pan 0 looks along +Y, pan grows clockwise seen from above, tilt up is positive. The **calibration** places the tracking origin in the world (origin, turn, height offset), maps zoom counts to focal length (two points: wide and tele counts with their focal lengths, interpolated), and sets the delay. Each tracked shot can carry its own calibration and listen to one camera ID.

Lens

Lens matching bends the virtual picture like the real lens with radial distortion coefficients k1 and k2 around a centre. The scene is rendered with a slightly wider field of view (over-scan) so the bent corners are never

empty, then warped. Focus for depth of field can come from the FreeD focus encoder through a calibration table of counts against metres.

Optical tracking

Printed square markers (4 × 4 bits in a black border, 50 IDs) are found in the studio camera's own picture. With 3 or more markers at different depths the camera pose is solved every frame; with 2 or more in view the zoom can be solved too. The lens calibration sets the field of view and k1, k2. Markers can be printed in two greens so the key removes them.

LED wall projection

The wall shows an off-axis (generalised perspective) projection from the tracked camera's position through the wall's corners, so the set looks right from the camera only. A curved wall is split into flat sections, each with its own off-axis view, laid side by side in the output: the wall unrolled flat. Arc length = width; radius = width ÷ arc (radians).

E 7

Placement and depth maths

MODE	HOW THE PERSON IS PLACED
World	A card at a fixed position, turned to the camera or fixed. Size from the picture height.
Depth keying	The feet are found in the matte (centre of the lowest 4% of the solid rows). A ray from the program camera through the feet meets the floor; that point's distance along the view is the depth. The card is set at that depth facing the camera and exactly filling its view, so the person stays where the real camera saw them and objects in front hide them. Smoothed over frames.
FreeWalking	The same feet ray, but from a model of the real locked camera (distance to the mark, lens height, tilt, vertical field of view). The person lands at that spot of the set while the program camera is free.
Riding	The card follows an animated object's matrix with a stored offset.

Body depth inflates the matte: a distance transform from the outline gives a round edge over about 14% of the picture's short side, smoothed, then pushes the card's 96 × 96 grid towards the camera by up to the set depth. It updates every 4th frame and is blended over time to avoid flicker.

> Depth keying and FreeWalking are only as good as the feet: the key must show the feet on the floor, and a wrong camera height or tilt makes the person slide when they walk.

E 8

Outputs and recording

OUTPUT	FORMAT AND NOTES
Program window	Full screen on a second display, master or a Rec.709 view of it.
NDI	Program as an NDI source, optional frame-locked clock. Needs the free NDI runtime.

SDI out	AJA (KONA, Io, Corvid, T-TAP Pro) and Blackmagic DeckLink / UltraStudio. 10-bit YCbCr 4:2:2 (v210), video range, Rec.709 or Rec.2020 matrix. 1080p, 1080PsF, 1080i and 720p at broadcast rates. Genlock to house reference.
Fill + key	DeckLink: fill on one SDI, key on the next (external), or keyed inside the card (internal). Content: graphics only, or AR (3D set + graphics, no background). Premultiplied or straight.
SDI in	DeckLink inputs follow the arriving format (up to what the card takes, including 6G / 12G cards). AJA inputs: SD, HD and 3G up to 1080p60.
Pro recording	Apple ProRes 422 HQ, ProRes 4444, Avid DNxHR HQX, all 10-bit, with audio, from the master. Browser recording is H.264 / WebM 8-bit.
ISO	Every camera input recorded on its own, frame for frame with the program.
Layers for post	Background, people and matte, recorded with every take (before post, DOF and graphics).
Camera data	Every frame's camera pose and lens with timecode, for match-moving in post.
Streaming	Up to 8 destinations at once: RTMP / RTMPS (YouTube, Facebook, Twitch, Kick, any server) and SRT (mpegts). Video bitrates 2,500 to 12,000 kbps, AAC audio, reconnects. Stream keys stay on the computer, never in the project.

E 9

Ports and protocols

All servers below run in the desktop app, listen only while switched on, and most accept an address allow-list. Open these ports in the computer's firewall and on any managed switch.

SERVICE	TRANSPORT	DEFAULT PORT	NOTES
FreeD tracking in	UDP	40000	D1 packets from trackers, PTZ cameras, cranes.
FreeD to Unreal	UDP out	127.0.0.1:40000	Korek's program camera, for Live Link FreeD in Unreal.
Remote control and HTTP API	HTTP	7351	Key required on every call (query `key` or header `X-Korek-Key`). Also serves the phone remote and tally pages.
Cluster	TCP	7350	Hub on the main computer; render nodes join it.
Guests	HTTPS + WebRTC	7443	Self-signed certificate; guests accept it once. Up to 8.
RossTalk	TCP	7788	From Ross switchers, DashBoard, XPression.
TSL UMD 3.1 tally	UDP out	8900	To a tally interface or multiviewer, with an address offset.
MOS	TCP	10540 / 10541	Lower and upper ports to the newsroom (NCS).
PTZ (VISCA over IP)	UDP out	52381 (Sony) / 1259	To each robotic camera.
NDI	mDNS + TCP	NDI's own	Discovery and transport by the NDI runtime.

RossTalk commands understood

COMMAND	DOES
`GPI n`	Macro n (or shot n, as set in the panel)
`CC 1:n · CC 2:n · CC 3:n`	Macro n · take shot n · go to rundown item n
`NEXT, GO`	Next rundown item
`CUT, MECUT 1`	Cut to the preview
`TAKE, AUTO, MEAUTO 1`	Take the preview with its transition
`KOREK cmd a=b …`	Any HTTP API command, for example `KOREK replay action=last seconds=8`

E10

HTTP API reference

`GET http://computer:7351/api/<command>?key=…&…` . Every answer is JSON: `{ ok, error?, state? }` . Shots, cues, macros, screens and other items are found by id, by name (any case) or by their number from 1.

CALL	DOES
`/api/state`	Shots, program, preview, tally, macros, graphics, rundown, replay, stream state
`/api/take?shot=2 · /api/cut · /api/preview?shot=Wide`	The switcher
`/api/graphics?lowerThird.on=true&lowerThird.title=Jane`	Any built-in graphic field; booleans take true, false or toggle
`/api/graphics?item.Scores.on=true`	A custom graphic in or out; `item.NAME.BOX=text` sets a text box; `.title` , `.rows` , `.columns`
`/api/vars?home.score=3`	Values for {{name}} in every graphic
`/api/talent?talent=Anna&action=in`	in, out, toggle; `&spot=Desk` teleports to a saved spot
`/api/prompter?action=play`	play, pause, toggle, top, faster, slower
`/api/record?action=start`	start, stop
`/api/screen?screen=1&action=play&clip=2`	play, pause, stop, restart, next, prev
`/api/light?action=go&cue=Opening`	go, next, back, blackout, restore, release
`/api/location?location=Desk`	Go to a saved location
`/api/rundown?action=next · action=goto&item=3`	The running order
`/api/media?media=Intro · action=off`	Media to air
`/api/sound?sound=Applause · action=stop`	Sound cart
`/api/stream?action=start`	start, stop (desktop app)

`/api/macro?macro=Opening`	Run a macro
`/api/replay?action=last&seconds=8&speed=0.5`	last, mark, play (&mark=id), stop

> Keep the remote key private and the allow-list tight: anyone with the key on the network can drive the show.

E11

Performance engineering

The frame budget is 1000 ÷ output rate: 40 ms at 25p, 20 ms at 50p, 16.7 ms at 60p. The top bar shows frames per second and the frame time; keep the frame time under about 80% of the budget on air.

FEATURE	COST	LEVER
Render scale	Pixels grow with the square	1.0 for HD; above 1 is supersampling
MSAA 2 / 4 / 8	Moderate	4 is the usual balance; SMAA or FXAA are cheaper edge filters
Shadows, planar reflections	One extra render each	Turn off reflections on sets without shiny floors
Global illumination	Spread over frames	Lower its speed setting; it updates only when the set changes
Post process	Switches to the film path	Each effect is skipped at zero
Mix transition, LED sections, layers	Close to one full frame each	Prefer cuts and camera moves on a weak GPU
AI key	Per input	Use chroma where a screen exists
Splat worlds	Millions of blended blobs	Lower Detail; sorting runs off the main thread
Recording, NDI, SDI	A read-back per frame	The 10-bit master costs the same as 8-bit

Size a machine for the worst moment of the show (a mix between two shots with the LED wall and layers recording), not for the average.

E12

Project data and safety

- The whole studio setup lives in the project, under the scene's Virtual Production settings: talents, keys, shots, graphics, cues, macros, rundown, outputs. A show preset (.korekshow) carries the setup without the project's media.
- Every stored value is checked on load: numbers clamped to their ranges, unknown values dropped, missing ones set to safe defaults. A project from an older version opens with new features off.

- Media (clips, pictures, fonts, splats) are project assets named by the SHA-256 of their bytes, so the same file is stored once.
- Every change is an undoable command; dragging a slider is one undo step, not hundreds.
- Stream keys, remote keys and licence data are never written into the project.

E13

Limits and design rules

ITEM	LIMIT
Camera inputs / shots / guests / stream destinations	32 / 64 / 8 / 8
NDI and SDI inputs at once	8 each
Custom graphics / fonts / text boxes per graphic	40 / 12 / 24
Splat worlds / splats per world	4 / 6 million
Curved LED sections	2 to 24
Input delay	0 to 15 frames

What the system does not do

- Splat worlds are backgrounds: people cannot walk behind their objects, they catch no shadows and the set's lights do not change them.
- Body depth is a relief from the outline, not a 3D capture: no back, no arms separated from the body.
- Ray-traced plates hold only while the camera does not move, and carry no talent shadows or post.
- Unreal Engine runs as a separate program feeding a video input; it is not rendered inside Korek.
- One GPU per computer drives the render. More channels come from more computers (Cluster).
- Voice recognition needs Chrome or Edge with internet; the desktop app does not listen yet.

E14

Commissioning checklist

CHECK	PASS WHEN
Origin survey	Floor origin and +Y taped; tracker, LED wall and FreeWalking marks set from it.
Genlock	SDI status shows the reference locked; no repeats over 10 minutes.
Frame budget	Frame time under 80% of the budget in the heaviest shot, with recording on.
Tracking delay	Fast pan: set and person move together.
Lens	A straight edge stays straight at the picture corners, wide and tele.
Key	No green line at 100% on a monitor; hair and glass hold; Clean the background removes all haze.
Colour	Skin matches the set's light; the master curve matches the recorder and the vision mixer.
Outputs	Every output (SDI, NDI, stream, recording) checked on its real destination.

Control	Every macro, RossTalk command and API call used in the show fired once from its real source.
Recovery	Save the project and a show preset; restart the app and reload; the show comes back as it was.

A

Keyboard shortcuts

VIRTUAL PRODUCTION	
`Shift+F9`	Open Virtual Production
`Enter`	TAKE the preview
`C`	CUT to the preview
`1` … `9`	Shot to preview
`G`	Lighting: GO next cue
`B`	Lighting: blackout / back
`Esc`	Leave Virtual Production
`W` `S`	Fly forward / back along the view (tilt included)
`A` `D`	Slide left / right (level)
`E` / `Q`	Up / down (free view)
Arrows · `Shift`	Turn and look · go faster
Drag / right-drag / wheel	Look / move / go forward (free view)
`Alt` **+wheel**	Zoom (free view)

GALLERY	
`Space`	GO next rundown item
`F1` … `F12`	Sound cart
`Shift+F1` … `F12`	Macros 1 to 12
`Esc`	Stop sounds, then close

MOVE IN PICTURE	
Drag	Move on the floor
`Shift` **+drag**	Up and down
`Alt` **+drag**	Turn
Wheel	Bigger or smaller

B

Before you go on air

CHECK	WHY
Save the project	Everything in Virtual Production is stored in it.
Output frame rate = studio rate	Recorders, SDI, NDI and the stream all follow it.
Frame budget green	Lower the render quality or remove heavy objects if not.
Matte outlines off	"Show the shapes" draws on the program.
SDI reference LOCKED	A clean cut in the station switcher.
Stream keys saved, upload tested	About 1.5 × the total of all destinations.
Guests joined and heard	Check their sound and their ON AIR light.
Tally on every camera	Phone pages open, or TSL to the controller.

Recorders armed, timecode showing	Camera data lines up with the clips.
Rundown at the first item	Press Reset, then `Space` to start.

C

Problems and fixes

PROBLEM	WHAT TO DO
My camera is not in the list	Install the card's driver, connect it, press Refresh cameras and capture cards, and allow camera access.
Green edges or a noisy key	AI auto key, more Spill, a clean plate, even light on the screen, people further from it.
The person floats	AI assist in Shadow and reflection, or Lock the feet to the floor.
An Unreal GLB comes in as one object	Import it again and press Import as editable meshes, with One object per material ticked. Export from Unreal without Draco mesh compression.
W A S D do nothing	They fly a free view: put a free shot on air. Click outside any text box first.
A virtual object covers my real desk	Add a Real foreground shape over the desk (section 08).
The presenter shows through an object in the background video	Add a Holdout (Hides: everything) where the object is.
The 360 floor shadow is missing	Shadows on under Look and speed; raise Shadow; check the Floor height and the sun.
A PTZ camera does not move	Check its IP address, that VISCA over IP is on in the camera, and the protocol (VISCA 1259 or Sony 52381). Use the desktop app.
A shot trigger does nothing	Check the right shot is chosen in Shot triggers, press Try it now, then TAKE the shot (triggers run when a shot goes on air).
Jagged edges	Look and speed: Anti-aliasing MSAA + SMAA, and Render quality 150% if the frame budget allows.
Bounce light leaks or flickers	Global illumination: raise Leak fix and Smoothness, or Probe density.
The output stutters	Watch the frame budget; lower render quality, reflections, post process or replay inputs.
A stream says Reconnecting	The internet dropped or is too slow: lower the video quality or the number of destinations.
A stream fails to start	Check the key (paste it again) and that the server starts with rtmp:// or rtmps://.
A guest cannot open the link	They must be on the same Wi-Fi; tap Advanced, then Proceed at the certificate warning; check the port is not blocked by a firewall.
A guest hears an echo	Keep "hear the show without their own voice" on, and ask them to use earphones.
Replay says it cannot encode	Use the desktop app or Chrome / Edge, and update the graphics driver.
Ross does nothing	Check the port (7788), the Only from list, and that the computer's firewall allows it.

The set slides when the camera moves	Check tracking Origin and Turn, and measure the Video delay again.
SDI says NOT LOCKED	Check the reference cable; AJA: or choose Free run.
Dark edges on the fill + key	Match Premultiplied fill to the mixer's setting.

More help: ortho2d.com/studio-guide · Contact: ortho2d.com/support · Korek 3D Studio is a product of Korek Production. © 2026.

APPENDIX D

Every control, section by section

Every section of Virtual Production in the order of the panels, with every control: what kind it is, its range and unit, its value in a new project, and what it does. Read together with the task chapters (how to use it) and Part 10 (how it works).

How to read the tables. **Type** gives the control and its range; a number box with no upper limit says "any". **New project** is the value a new project starts with; empty when it depends on your set or inputs. Buttons act at once and have no value. Section locations: **Left panel** is about the selected person; the right panel has the tabs Set, Show, Cameras and Output. Every section can also be found with the search box (`/`).

Talent and inputs LEFT PANEL

The people in the show. Each talent is one picture: a camera or capture card, a screen, a video file or a sample clip. Add more with + Talent.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Name	Text	Talent 1	The talent's name, used in lists, shot set-ups, voice commands and the API.
Input	List: Sample: Presenter, waist-up · Sample: Engineer at a desk · Sample: Businesswoman walking, full body · Camera / capture card · Screen or window… · Video file… · Guest 1 · Guest 2 · Guest 3 · Guest 4 …	Sample: Presenter, waist-up	Where the picture comes from: a camera or capture card, an NDI source, an SDI input of a DeckLink or AJA card, a guest, a clip in the project, or a built-in sample presenter.
Delay	Number 0 to 15 frames	0 frames	Shows this input this many frames late. Use it when the background comes from another engine (Unreal over NDI) and arrives after the camera picture: raise it until a fast pan shows the person and the background moving together. The AI key reads the live picture, so with a delay prefer the chroma key.
+ Talent	Button		Adds another keyed camera input (up to 32).
Refresh cameras and capture cards	Button		Lists the video devices again, after plugging a camera or a capture card in.

IN THE PANEL

Sample: Presenter, waist-up (green screen) · 1280×720

Sample: Presenter, waist-up (green screen) · 1280×720 · AI matte loading

Key LEFT PANEL

Removes the green or blue screen (or the whole background, with AI) so only the person is left. Start with AI auto key, then fine-tune.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Mode	Choice: Chroma · AI + chroma · AI only · External · Off	Chroma	Chroma (green or blue screen), AI (person segmentation, no screen needed), Hybrid (AI shape with chroma edges), External (a hardware keyer's key signal) or None.
Key colour	Colour	#19ca1e	The screen colour as the camera sees it. Pick it from the picture, or let AI auto key find it.
Similarity	Number 0 to 0.6	0.22	Chroma distance from the key colour that is removed completely. Raise it until the screen is gone, no further.
Softness	Number 0 to 0.5	0.12	The soft band above Similarity: how gradually pixels go from removed to solid. Raise it for hair and motion blur.
Spill	Number 0 to 1	0.7	Removes the screen's colour cast from the person (green on shoulders and hair), keeping brightness.
Glass and reflections	Number 0 to 1	0	For glasses, bottles, glass desks, hair, smoke and motion blur: they stay see-through and keep their real highlights and reflections instead of turning into holes or green. 0 = off, 1 = full.
Edge choke	Number -0.9 to 0.9	0	Shrinks (positive) or grows (negative) the matte before finishing.
Edge blur	Number 0 to 3	1	Softens the matte edge, in pixels.
Cut the edge	Number 0 to 6 px	0 px	Trims this many pixels from the outline all round. The thin green (or blue) line that stays on the edges of the person goes. 1 is usually enough; more starts to eat fingers and hair.
Soften the edge	Number 0 to 4 px	0 px	A soft fall-off inwards after the cut, so the outline is not hard like a sticker.
Edge colour	Number 0 to 1	0	Takes the screen's colour out of the soft edge pixels: hair, fur, motion blur. Works with every kind of key, the AI one too (which has no spill removal of its own).
Hair detail	Number 0 to 1	0	AI and hybrid keys: around the outline, fine strands are taken from the screen colour instead of the AI's rougher shape, so loose hair stays and the screen between the strands goes. Needs a green or blue screen behind the person, and the right screen colour above.
Clean the background	Number 0 to 0.9	0	Matte black point: anything fainter than this is removed completely. Clears the faint haze and noise left around the person.
Fill the person	Number 0.1 to 1	1	Matte white point: anything more solid than this becomes fully solid. Closes faint holes and see-through patches inside the person.

Crop	Number	0	Garbage matte: cut away lights, stands and the edges of the green screen (left, right, top, bottom, % of the picture).
Mirror	Tick box	off	Flips the picture left to right, for front-facing webcams.
✦ AI auto key	Button		Finds the screen colour and sets Similarity, Softness and Spill from the current frame.
✦ AI light match	Button		Measures the set's light behind the person and sets exposure and warmth so the person matches it.
Capture clean plate	Button		Step out of the picture first: the empty green screen is recorded and used to key wrinkles, shadows and uneven light perfectly (screen correction)
Clean edges and hair	Button		A starting point for finishing: cut 1 px, soften 1 px, edge colour 0.8, hair detail 0.7, matte levels 0.04 / 0.96.
Off	Button		Switches every finishing control off.
Key input	List: Choose the KEY input… · Camera / capture card · Screen or window… · Sample presenter (green screen) · Guest 1 · Guest 2 · Guest 3 · Guest 4 · Guest 5 · Guest 6 …	Choose the KEY input…	External mode: the input that carries the key (matte) signal, for example a hardware keyer's KEY output.
Key gain	Number 0.1 to 4	1	External mode: multiplies the key signal; raise it if the person is not fully solid.
Invert key	Tick box	off	External mode: for a key signal that is black where the person is.

IN THE PANEL

After the key (the AI one too), clean what is left on the outline. Start with the button, then adjust.

Hardware keyer such as Blackmagic Ultimatte: connect its FILL output to this talent's input and its KEY (matte) output to a second capture input.

Colour and light LEFT PANEL

Makes the person match the set: brightness, colour, warmth, and light wrap so the set's light spills over their edges.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Exposure	Number -3 to 3	0	Brightness of the person, in stops (−3 to +3).
Saturation	Number 0 to 2	1	Colour strength of the person (0 = black and white, 1 = as shot, 2 = double).
Warmth	Number -1 to 1	0	White balance of the person: minus is cooler (blue), plus warmer (amber).
Tint	Number -1 to 1	0	Green (minus) to magenta (plus) balance of the person.
Light wrap	Number 0 to 1	0.25	How much of the set's light bleeds onto the person's edges, so they sit in the set (0 to 1).

Colour correction LEFT PANEL

Professional colour correction for this camera input, after its key: colour wheels for shadows, midtones and highlights, contrast, colour bars that change one range of colours (skin, greens, blues…) and tints.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Contrast	Slider 0 to 2	1	Contrast around the Pivot (1 = none, 0 = flat, 2 = double).
Pivot	Slider 0.05 to 0.95	0.44	The level contrast turns around (0.435 = middle grey in video levels).
Saturation	Slider 0 to 2	1	Colour strength (0 = black and white, 1 = unchanged, 2 = double).
Hue	Slider -180 to 180	0	Turns every colour round the colour circle, in degrees, keeping brightness.
Shadows / highlights balance	Slider 0.05 to 0.95	0.5	Where the shadow tint ends and the highlight tint begins, as a brightness level.
Colour correction (neutral)	Tick box	on	Switches the colour correction on or off. "(neutral)" means nothing is changed yet.
Shadows colour	Colour	#3355ff	Shadow tint: the colour added to the dark parts. Its slider sets how much.
Highlights colour	Colour	#ffaa55	Highlight tint: the colour added to the bright parts. Its slider sets how much.
Whole picture colour	Colour	#ffd9a0	A colour wash over everything. Its slider sets how much.
Reset all	Button		Puts every wheel, slider, bar and tint back to neutral.
Lift	Colour wheel	neutral	Colour wheel for the shadows. Drag the puck towards a colour to tint them; the slider lifts or lowers the blacks. Double-click resets.
Gamma	Colour wheel	neutral	Colour wheel for the midtones (faces, most of the picture); the slider brightens or darkens them.
Gain	Colour wheel	neutral	Colour wheel for the highlights; the slider scales the whites (1 = unchanged).
Offset	Colour wheel	neutral	Colour wheel that moves the whole picture at once.
Colour bars	7 bars × 3 sliders	neutral	Seven bars (Red, Skin, Yellow, Green, Cyan, Blue, Magenta), each with Hue (−60° to +60°), Colour (−1 to +1) and Brightness (−1 to +1), changing only that range of colours.

IN THE PANEL

Drag a wheel towards a colour to push that part of the picture to it; the slider under it makes that part brighter or darker. Double-click resets.

Each bar changes one range of colours only: turn its hue, make it stronger or weaker, brighter or darker. Skin is the range of faces and hands. Double-click a slider to reset it.

Place in the world LEFT PANEL

Where the person stands in the 3D set: position, rotation and size, each with a lock. Or use depth keying to place them at their real distance from the camera.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Placement	Choice: Stand in the set · Depth keying	Stand in the set	Depth keying puts the person at their real distance from the camera: virtual objects in front of them hide them (walk behind a desk), objects behind stay behind. Best with a tracked camera or a locked-off camera matched to the shot.
Position	Number m	0 m	Where the person's feet stand in the set, in metres. Tip: turn on Move in picture and drag them in the Program picture (Shift + drag = up and down).
Facing	Choice: The camera · Fixed	The camera	The camera: the picture always turns to face the program camera, like a cut-out that follows you. Fixed: it keeps the turn you set (Rotation Z).
Rotation	Number °	0 °	X tilts the picture forward or back, Y leans it sideways, Z turns it around (degrees). Changing Z switches Facing to Fixed.
Size	Number 5 to 2000 %	100 %	Make the person bigger or smaller in the world (100% = real size from the picture height).
Scale	Number %	100 %	Stretch the picture on one axis: X = width, Y = thickness (for shadows), Z = height, in %. With the link on, the unlocked axes change together.
Opacity	Number 0 to 1	1	How solid the person is (0 to 1).
Picture height	Number 0.2 to any m	2.2 m	How tall the camera picture is in the world (metres). A person filling about 80% of the frame at 1.75 m → about 2.2 m.
Appears with	List: Cut · Fade · Beam (teleport) · Number 0 to 10 s	Cut · 0.8 s	How the person comes and goes when you tick Visible, and when they jump to another spot: a cut, a fade, or a beam of light.
Body depth	Number 0 to 1 m	0 m	Gives the flat video a body: the person's outline is inflated like a pillow, so when the virtual camera moves round them they have volume instead of being a flat cut-out. 0 = flat. About 0.25 m suits a standing person. It is a relief made from the outline, not a 3D scan.
Casts shadows	Tick box	on	The person casts a shadow on the set.
Visible	Tick box	on	Shows or hides the person, with the Appear effect.
The person walks through the set	Tick box	off	FreeWalking: a locked, untracked real camera; the feet place the person in the set while the virtual camera is free.
Lock all	Button		Locks every position, turn and size value, so dragging in the picture cannot move the person.
Drop to floor	Button		Puts the person's feet on the floor (Z = 0).
Centre	Button		Moves the person to the studio origin.

⟲ 90° / ⟲ 45° / ⟳ 45° / ⟳ 90°	Button		Turns the person by that angle.
Reset position	Button		Position back to the default.
Reset rotation	Button		Turn, tilt and lean back to zero.
Reset scale	Button		Size and stretch back to 1.
+ Save this place as a spot	Button		Stores the current position and turn as a teleport spot (up to 24).
Remove talent	Button		Deletes this input and its settings.
Camera distance	Number m	4 m	From the real camera to the mark on the floor, measured along the floor.
Camera height	Number m	1.5 m	The height of the real camera lens above the green floor.
Camera tilt	Number °	5 °	How far the real camera points down (0 = level).
Field of view	Number °	40 °	The real lens, top to bottom of the picture. About 40° for a 28 mm lens on a full-frame camera, 27° for 50 mm.
Spot n	Button		Send the person to this spot
Distance	Choice: From the feet (auto) · Set by hand	From the feet (auto)	Depth keying: From the feet (found automatically every few frames) or Set by hand.
Floor height	Number m	0 m	Depth keying: the height of the real floor the feet stand on.

IN THE PANEL

Z follows the camera. Type a value in Z, or choose Fixed, to set your own turn.

For a camera that does not move and is not tracked. Tell Korek where the real camera stands; the person's feet are found in the picture and they are placed at that very spot of the virtual set, so they walk closer, further and sideways through it while the virtual camera is free to move. The position above is the person's mark: the point on the floor the real camera looks at.

Click a spot to send the person there. By voice: "teleport Talent 1 to Spot 1". From the remote: /api/talent?talent=Talent 1&spot=Spot 1

Matte objects LEFT PANEL

Invisible shapes for what is in front of what: a holdout hides the talent (or the set) behind it, for objects that are only in the background picture or the 360 world; a real foreground keeps a real desk or prop of the studio in front of the virtual set.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Show the shapes (an outline on the program while you set them up)	Tick box	off	Draws each matte shape as an outline on the program, for setting up only.
+ Holdout	Button		Adds an invisible shape that hides the set behind it and shows the camera picture there (a real object the virtual set must not cover).
+ Real foreground	Button		Adds an invisible shape that keeps the real camera picture in front of everything (a real desk in front of the virtual set).

+ Holdout from an object	Button		Makes a holdout from the shape of an object of the set.
+ Real foreground from an object	Button		Makes a real-foreground matte from the shape of an object of the set.
Name	Text	Holdout 1	The matte's name in the list.
Type	Choice: Holdout · Real foreground	Holdout	Holdout: hides what is behind it. Real foreground: the camera picture stays on top inside the shape, for a real desk or prop in the studio.
Hides	Choice: Everything · Only the talents	Everything	Everything: the talents and the 3D set behind the shape are cut, the background (video, 360 world or sky) shows. Only the talents: the 3D set stays, only the people behind the shape are cut.
Shape	Choice: Box · Cylinder · Flat card	Box	Box, Cylinder or Flat card: a shape you place. Object: the exact shape of a mesh of the set (it follows that object). Switching from Object to a box gives a box around the object.
Position	Number m	0 m · -4.5 m	Centre of the matte's base in studio space, metres.
Size	Number m	1.6 m · 0.8 m · 1.1 m	Width, depth and height, metres.
Turn	Number °	0 °	Turn about the vertical, degrees.
Move in picture	Button		Drag the matte in the program picture.
In front of the camera	Button		Puts the matte in front of the program camera.
Just in front of ‹talent›	Button		Puts the matte just in front of that person.
Delete	Button		Removes the matte.

IN THE PANEL

Invisible shapes that decide what is in front of what. A holdout hides whatever is behind it, so a talent can walk behind a car or a wall that is only in the background video or the 360 world. A real foreground keeps a real desk or prop of your studio in front of the virtual set.

From an object: click a mesh of the set in the Program picture and a copy of its exact shape becomes the matte. It follows the object, and the object itself is hidden so only its shape cuts.

⚠ The outlines are on the program and the recordings: turn them off before going on air.

A talent behind the shape is hidden, in front of it they stay in front: it follows their distance (use Depth keying, or Stand in the set at their real place). Match the shape to the object in the background picture from the program camera.

Shadow and reflection LEFT PANEL

How the person sits on the floor: feet locked to the floor, a shadow that keeps the full body when the light comes from the side, a soft contact shadow under the feet and a reflection on glossy floors. AI assist sets them all from the matte, the lights and the floor.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Shadow shape	Choice: Camera · Key light	Camera	Camera: the card's own shadow (right when the light is near the camera). Key light: the shadow is cast by a hidden copy of the person turned to the key light, so a side light still throws a full body shadow instead of a thin line.

Contact shadow	Number 0 to 1	0	The soft dark patch right under the feet that every real floor shows. It grounds the person even when no light casts a shadow. 0 = off.
Reflection	Number 0 to 1	0	A mirror image of the person on the floor, faded with height. Use it on glossy floors that do not reflect by themselves; a floor with planar reflections already reflects the person. 0 = off.
Lock the feet to the floor	Tick box	off	Keeps the feet exactly on the floor even when the matte moves at the bottom.
✦ AI assist: perfect shadow and reflection	Button		Measures the person and the set's light and sets shadow and reflection to match.

IN THE PANEL

Depth keying places the person from the feet already; these settings are for a talent standing in the world.

Saved locations RIGHT PANEL · SET TAB

Save where you are (the set's position, turn and size with the camera) under a name, and go back to it later from the list.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Move the camera smoothly to a location (uses the transition time)	Tick box	on	Going to a saved location moves the camera there over the transition time instead of cutting.

IN THE PANEL

Save where you are: the set's position, turn and size together with the camera. Go back to any saved location later with one click.

Guests RIGHT PANEL · SHOW TAB

People join the show from a phone or laptop on the same Wi-Fi with a link or QR code. Their camera becomes an input (in the set, on a screen, or full picture) and their microphone a fader in the gallery. They see the program and hear the show. Desktop app.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Port	Number 1024 to 65535	7443	The guest page's port on this computer (https).
Guests see the program	Tick box	on	Each guest receives the program picture.
Guests hear the show (without their own voice)	Tick box	on	Each guest receives the programme sound minus their own microphone.
Take guests	Button		Starts the guest server on the studio network (port 7443).

IN THE PANEL

Guests join through the desktop app (it serves the guest page on this Wi-Fi).

RossTalk RIGHT PANEL · SHOW TAB

Ross switchers (Carbonite, Acuity), DashBoard panels and XPression control Korek over RossTalk: run macros, take shots, GO the rundown. Desktop app.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Port	Number 1 to 65535	7788	Ross equipment sends RossTalk to port 7788 unless set otherwise.
Only from	Text	any (e.g. 10.0.0.20, 10.0.0.21)	Addresses of the Ross equipment allowed to send (comma separated). Empty = any computer on the network.
GPI n	Choice: Runs macro n · Takes shot n	Runs macro n	What a "GPI n" command from a Ross device does: run macro n or take shot n.
Take RossTalk commands (desktop app)	Tick box	off	Listens for RossTalk on TCP (port 7788).

IN THE PANEL

From a Carbonite custom control or DashBoard button: GPI n, CC 1:n (macro n), CC 2:n (shot n), CC 3:n (rundown item n), NEXT, CUT, TAKE, or KOREK replay action=last seconds=8 for any remote command. Macros can send RossTalk back to Ross equipment (a RossTalk step).

Voice commands RIGHT PANEL · SHOW TAB

Say "camera two", "lower third in" or "run opening" and Korek does it. The microphone listens only while you switch it on; an optional wake word keeps ordinary talk from triggering anything.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Wake word	Text	none	A word that must come first, so ordinary talk in the room never triggers anything: with the wake word 'studio' you say 'studio, camera two'. Empty = every command is taken as it is heard.
Language	List: English (US) · English (UK) · Arabic · French · Spanish · German · Italian · Portuguese · Turkish · Hindi	English (US)	The speech language the microphone listens for.
Listen for voice commands	Tick box	off	Switches the microphone on. It listens only while this is ticked.
Try a command	Text	Try one by typing: camera two	Type a command to test it without speaking.
Try	Button		Runs the typed command.

IN THE PANEL

Say a command and Korek does it, the same as pressing the button. The microphone listens only while this is on.

Commands are in English words in this version (the language setting helps the microphone understand your accent and the names of your shots and graphics).

Cameras: “camera two”, “take wide shot”, “cut to desk”, “preview three”, “take”. Graphics: “lower third in”, “ticker off”, or a custom graphic by its name: “top scorers in”. Show: “run opening” (a macro), “start recording”, “go live”, “next”, “replay”, “blackout”, “go to desk”, “prompter play”.

MOS (newsroom) RIGHT PANEL · SHOW TAB

The newsroom system (ENPS, iNEWS, Octopus, OpenMedia) sends its running order over MOS and it becomes the Gallery rundown. Desktop app.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
MOS ID	Text	korek.studio .mos	The name of this device. Type exactly the same in the newsroom system when you add Korek as a MOS device.
Newsroom ID	Text	for example ENPS1	The NCS ID of the newsroom system, as its administrator gives it. Messages from any other system are ignored. Empty = accept any (only for a first test).
Ports	Number 1 to 65535	10540 · 10541	MOS uses 10540 (lower) and 10541 (upper). Change them only if the newsroom is set to others.
Only from	Text	any (e.g. 10.0.0.5, 10.0.0.6)	Addresses of the newsroom servers allowed to connect (comma separated). Empty = any computer on the network.
Take the running order from the newsroom (desktop app)	Tick box	off	Accepts running orders from the newsroom system over MOS (ports 10540 / 10541).
Tell the newsroom which story is on air	Tick box	off	Sends story status (on air, played) back to the newsroom.

IN THE PANEL

The newsroom system (ENPS, iNEWS, Octopus, OpenMedia, Dalet and others) sends its running order here over MOS, and it becomes the rundown in the Gallery. The newsroom owns the order, the names and the times; what each story does in Korek (shot, graphics, media, lighting) you add in the Gallery, and it is kept when the newsroom changes or moves stories.

MOS needs the Korek 3D Studio desktop app.

Tally lights RIGHT PANEL · SHOW TAB

Each camera operator sees when their camera is on air (red) or next (green): on a phone at the camera, or on tally hardware over TSL UMD.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
To	Text	192.168.1.50	Address of the TSL tally receiver (a tally interface or multiviewer).
Port	Number 1 to 65535	8900	Its UDP port (default 8900).
First address	Number 0 to 126	0	Shot 1 is this display address plus 1, shot 2 plus 2, and so on.
Send TSL tally (desktop app)	Tick box	off	Sends TSL UMD 3.1 tally for every shot (red on air, green in preview).

IN THE PANEL

Start the remote control (Remote control and HTTP API) first: each camera operator then opens their camera's tally page on a phone fixed to the camera.

Tally 1 = on air, tally 2 = next; the shot's name is the display text. Works with tally controllers, multiviewers and monitors that read TSL 3.1 over UDP.

Live streaming RIGHT PANEL · OUTPUT TAB

Send the program live to YouTube, Facebook, Twitch, Kick, any RTMP server or an SRT receiver, to several at once. Each destination reconnects on its own if the internet drops. Desktop app.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Video quality	List: 2500 kb/s (720p, slow internet) · 4500 kb/s · 6000 kb/s (1080p, recommended) · 8000 kb/s · 12000 kb/s	6000 kb/s (1080p, recommended)	The upload speed must be about 1.5 × the total of all destinations. YouTube: 4500 to 9000 kb/s for 1080p. Facebook and Twitch: up to 6000 kb/s.
Frame rate	List: 25 fps · 30 fps · 50 fps · 60 fps	30 fps	The stream's frame rate.
Sound	List: 96 kb/s AAC · 128 kb/s AAC · 160 kb/s AAC · 192 kb/s AAC · 256 kb/s AAC	160 kb/s AAC	Which sound goes into the stream: the programme mix or one microphone.
GO LIVE	Button		Go live on the destinations switched on in Live streaming
+ YouTube / Facebook / Twitch / Kick / Other (RTMP) / SRT	Button		Adds a destination with that service's server already filled in.

IN THE PANEL

Live streaming runs in the Korek 3D Studio desktop app. In the browser you can prepare the destinations; the keys are entered on the computer that streams.

The stream is the program at 1920×1080 with the gallery mixer's sound. Every destination reconnects on its own if it drops. Stream keys are never saved in the project.

Video screens RIGHT PANEL · SET TAB

A TV, monitor or LED wall of the set plays clips, pictures or a live input. Play, pause, stop and step through the clips; shots can start them when they go on air.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
New screen from an object	List: + Screen from object… · Box 01 · Sphere 01	+ Screen from object…	Turns a whole object of the set into a video screen.
New screen from a material	List: + Screen from material… · Clay · Glaze	+ Screen from material…	Turns every surface with that material into a video screen.

IN THE PANEL

Turn a TV, monitor or LED wall of the set into a video screen: it plays clips (or a live input), glows, and can start when a shot goes on air.

Quickest: drag a video or picture file from your computer straight onto any object in the Program picture: it plays on that object right away (on an object with several materials, only on the part you drop it on). Drop more files to add clips; hold Alt while dropping to replace them.

Lighting cues and console RIGHT PANEL · SHOW TAB

Lighting cues like a lighting desk: GO fades to the next cue, cues can follow on by themselves (animations), lights can pulse, strobe, flicker or cycle colours. A real lighting console can drive the lights over Art-Net or sACN.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Master	Slider 0 to 1	1	A grand master on every cue.
Protocol	Choice: Art-Net · sACN (E1.31)	Art-Net	Art-Net or sACN, the protocol the lighting console sends.
Cue channel	Text	universe · address	On the console, set this channel to N (1 to 255) to GO cue N here; 0 does nothing.
Listen to the lighting console	Tick box	off	The console drives the set's lights live over DMX.
+ New cue (all lights on)	Button		Adds a lighting cue starting from all lights on.
Auto patch (from address 1, dimmer + RGB)	Button		Gives every light four DMX channels (dimmer, red, green, blue) from address 1.

IN THE PANEL

The scene has no lights yet: add some (Create → Lights) to build cues.

No cue: lights as in the scene

The console link runs in the desktop app (a browser cannot receive Art-Net or sACN).

Lighting animation in the Studio timeline: select a light, then Set Key on its intensity at different frames. For shows, cues with "go to the next cue by itself" make a looping chase.

Set lights RIGHT PANEL · SET TAB

The set's own lights: on / off, intensity and colour, saved with the project.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
+ Point / + Spot / + Soft panel	Button		Adds that kind of light to the set.

IN THE PANEL

The set's own lights. Switch them on and off, change their strength and colour: saved with the project, no need to go back to the Studio. Lighting cues and shot triggers play on top of these.

The set has no lights yet: add one above.

Post process RIGHT PANEL · SET TAB

Like Unreal Engine's Post Process Volume: exposure, colour grade, bloom and glow, height fog with sun glow and light shafts (god rays), vignette, grain and contact shadows, on the program in real time.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Fog colour	Colour	#b8c6d8	Colour of the fog.
Glow colour	Colour	#ffd9a8	Colour of that glow.
Exposure (EV)	Slider -4 to 4	0	Overall brightness in stops.
Temperature	Slider -1 to 1	0	White balance, cool (minus) to warm (plus).
Tint	Slider -1 to 1	0	Green (minus) to magenta (plus).
Highlights	Slider -1 to 1	0	Brighter or darker bright parts.
Shadows	Slider -1 to 1	0	Brighter or darker dark parts.
Contrast	Slider -1 to 1	0	Contrast around the Pivot (1 = none, 0 = flat, 2 = double).
Saturation	Slider -1 to 1	0	Colour strength (0 = black and white, 1 = unchanged, 2 = double).
Vibrance	Slider -1 to 1	0	Saturation that boosts dull colours more than strong ones.
Lift (blacks)	Slider -1 to 1	0	Raises or lowers the blacks.
Gamma (mids)	Slider -1 to 1	0	Brightens or darkens the midtones.
Gain (whites)	Slider -1 to 1	0	Scales the whites.
Pivot	Slider 0.05 to 0.95	0.44	The level contrast turns around (0.435 = middle grey in video levels).
Hue	Slider -180 to 180	0	Turns every colour round the colour circle, in degrees, keeping brightness.
Shadows / highlights balance	Slider 0.05 to 0.95	0.5	Where the shadow tint ends and the highlight tint begins, as a brightness level.
Bloom	Slider 0 to 3	0.2	Strength of the glow round bright lights and screens.
Bloom threshold	Slider 0 to 5	1.6	How bright a pixel must be to glow (lower = more glow).
Bloom radius	Slider 0 to 1	0.45	How far the glow spreads.
Density	Slider 0 to 1	0.02	Fog thickness.
Height falloff	Slider 0.002 to 1	0.05	How fast the fog thins with height.
Fog base height (m)	Slider -20 to 50	0	The height where the fog is at full density.
Clear zone (m)	Slider 0 to 100	5	Distance from the camera with no fog.
Max opacity	Slider 0 to 1	1	The most the fog can cover (1 = can hide everything far away).
Sun glow	Slider 0 to 4	1	Glow in the fog round the sun direction.
Shaft strength	Slider 0 to 3	0.6	Strength of the light shafts.
Vignette	Slider 0 to 1	0.2	Darker corners.

Chromatic aberration	`Slider 0 to 1`	`0`	Colour fringes towards the picture edges, like a real lens.
Film grain	`Slider 0 to 1`	`0`	Moving grain.
Sharpen	`Slider 0 to 1`	`0`	Sharpens fine detail.
Post process on the program	`Tick box`	`off`	Switches the whole post process on the Program.
Colour correction (neutral)	`Tick box`	`on`	Switches the colour correction on or off. "(neutral)" means nothing is changed yet.
Height fog	`Tick box`	`off`	Fog that is thicker near the floor.
Light shafts (god rays)	`Tick box`	`on`	Rays of light from the sun through the fog.
Contact shadows (AO)	`Tick box`	`off`	Soft shadows where objects meet (ambient occlusion).
Post process look	`List: Neutral · Cinematic · Teal & orange · Golden hour · Cool night · Bleach bypass · Documentary · Bright interior · Black & white`	`Neutral`	A ready-made look; then adjust any slider.
Shadows colour	`Colour`	`#3355ff`	Shadow tint: the colour added to the dark parts. Its slider sets how much.
Highlights colour	`Colour`	`#ffaa55`	Highlight tint: the colour added to the bright parts. Its slider sets how much.
Whole picture colour	`Colour`	`#ffd9a0`	A colour wash over everything. Its slider sets how much.
From Studio Live look	`Button`		Use the fog and Film Look set in Studio's Live view
Reset	`Button`		Back to neutral, post process off.
Reset all	`Button`		Puts every wheel, slider, bar and tint back to neutral.
Lift	`Colour wheel`	`neutral`	Colour wheel for the shadows. Drag the puck towards a colour to tint them; the slider lifts or lowers the blacks. Double-click resets.
Gamma	`Colour wheel`	`neutral`	Colour wheel for the midtones (faces, most of the picture); the slider brightens or darkens them.
Gain	`Colour wheel`	`neutral`	Colour wheel for the highlights; the slider scales the whites (1 = unchanged).
Offset	`Colour wheel`	`neutral`	Colour wheel that moves the whole picture at once.
Colour bars	`7 bars × 3 sliders`	`neutral`	Seven bars (Red, Skin, Yellow, Green, Cyan, Blue, Magenta), each with Hue (−60° to +60°), Colour (−1 to +1) and Brightness (−1 to +1), changing only that range of colours.

IN THE PANEL

Drag a wheel towards a colour to push that part of the picture to it; the slider under it makes that part brighter or darker. Double-click resets.

Each bar changes one range of colours only: turn its hue, make it stronger or weaker, brighter or darker. Skin is the range of faces and hands. Double-click a slider to reset it.

Bright lights, screens and glowing (emissive) materials glow. Lower the threshold for more glow.

The glow and the shafts come from the set's strongest sun (directional) light: change its direction, colour and strength in Set lights.

Applied to the program, the recordings, NDI and SDI. The overall exposure and tone mapping are under Look and speed and Film colour.

Objects and materials RIGHT PANEL · SET TAB

Change the set without leaving: drag materials onto objects, drop video files onto screens, pick an object to change its colour, roughness, metal and glow.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Pick	Button		Click an object in the program picture to select it.

IN THE PANEL

Every object of the set: click one in the list (or Pick it in the Program picture) to give it another material or change its material. You can also drag a material onto an object in the Program picture, or drop a video / picture file onto a TV or wall to make it a playing screen.

Shot triggers RIGHT PANEL · SHOW TAB

What happens by itself when a shot goes on air: a screen plays a clip, a lighting cue goes, the lights black out.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Shot	List: 1. Wide	1. Wide	The shot whose triggers you are setting.
Add a trigger	List: + Add a trigger… · Blackout · Back from blackout	+ Add a trigger…	Something that happens when the shot goes on air: a video screen, a light cue, a blackout, one light, a PTZ preset.
Reset the lights	Button		Takes back every light change the triggers made.

IN THE PANEL

Nothing happens yet when Wide goes on air.

Nothing happens yet when View 2 goes on air.

Camera moves RIGHT PANEL · SHOW TAB

Programmed moves of the virtual camera through your shots, like a crane or dolly: each step has its own move time and hold, and the whole move can loop.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
+ Camera move	Button		Adds a programmed move: a list of shots with how and how long to go to each.

Name	Text	Move 1	The move's name.
Loop	Tick box	off	Plays the move over and over.
Step n shot	List: 1. Wide · 2. View 2	1. Wide	The shot this step goes to.
Step n how	List: move · mix · cut	cut	Cut, mix or move, and its time.
+ Step (the preview shot)	Button		Adds the preview shot as the next step.
Play	Button		Runs the move on the Program.
Delete	Button		Removes the move.

IN THE PANEL

Programmed camera moves: the virtual camera travels through shots by itself, like a crane or a dolly. Save the views you want as shots (+ Shot from this view), list them here with the time of each move, and press Play. Loop it for a slow continuous move behind a presenter.

Moving objects (ride) RIGHT PANEL · SHOW TAB

Play the scene animation in the show, and attach a camera or a talent to a moving object: a camera on a train, a person carried by a moving walkway, a lift or an escalator.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Speed	Number 0.05 to 4 ×	1 ×	Playback speed of the set's animation (1 = as made).
Wide	List: Not attached · Box 01 · Sphere 01	Not attached	The preview shot (the green one). Fly to the view you want first: on the train looking forward, beside the lift then choose the object. The camera keeps that view of the object and travels with it. A scene camera animated in the Studio, or placed on an animated object, follows by itself while the animation plays.
Talent 1	List: Not attached · Box 01 · Sphere 01	Not attached	Place the person on the object first (on the walkway, in the lift, on the train's floor), then choose the object. They are carried with it and turn with it. To place them somewhere else on it: choose Not attached, move them, attach again.
Loop	Tick box	on	Plays the animation over and over.
Play the animation	Button		Starts or pauses the animation in Virtual Production.
From the start	Button		Back to the first frame.
View 2	List: Not attached · Box 01 · Sphere 01	Not attached	The preview shot (the green one). Fly to the view you want first: on the train looking forward, beside the lift then choose the object. The camera keeps that view of the object and travels with it. A scene camera animated in the Studio, or placed on an animated object, follows by itself while the animation plays.

IN THE PANEL

Things of the set that move: a train, a lift, a moving walkway, an escalator. Animate the object in the Studio (Auto Key, move it, set keys), play the animation here, and attach a camera or a talent to it: the camera travels with it, or the person is carried by it while they walk on the spot.

Nothing in the scene is animated yet.

PTZ cameras RIGHT PANEL · CAMERAS TAB

Control real PTZ cameras over the network (VISCA over IP): pan, tilt, zoom, focus and presets. Shots can recall a preset when they go on air. Desktop app.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
+ PTZ camera	Button		Adds a robotic camera controlled with VISCA over IP.
Name	Text	PTZ 1	The camera's name, used in shot triggers.
IP address	Text	192.168.1.60	The camera's address on the network, the one you open its web page with.
Protocol	Choice: VISCA · Sony VISCA over IP	VISCA	VISCA (raw): PTZOptics, BirdDog and most cameras, port 1259. Sony VISCA over IP: Sony cameras and those that follow them, port 52381.
Port	Number 1 to 65535	1259	Its VISCA port (52381 for Sony, 1259 for most others).
Move speed	Slider 1 to 24	8	Pan and tilt speed of the arrow buttons.
Zoom speed	Slider 0 to 7	3	Zoom speed.
Store: the next number you press saves where the camera is now	Tick box	off	While ticked, a preset number stores instead of recalls.
Zoom in / Zoom out / Focus near / Focus far	Button		Hold to move the lens.
Auto focus	Button		Switches the camera to auto focus.
1 to 10	Button		Recall preset n (or store it while Store is ticked).
Remove camera	Button		Removes the camera from the list.

IN THE PANEL

Move real PTZ cameras from here: pan, tilt, zoom, focus and presets, over the network (VISCA over IP: Sony, PTZOptics, BirdDog, Marshall, Lumens, Avonic and others). A shot can send a camera to a preset when it goes on air (Shot triggers). Sending needs the Korek 3D Studio desktop app; you can set the cameras up here.

Show presets RIGHT PANEL · SHOW TAB

Save the whole Virtual Production setup (keying, look, graphics, output, cameras, moves) as a file and load it in another project or on another computer.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Save show preset	Button		Saves the whole Virtual Production setup as a .korekshow file, without the project's media.
Load show preset	Button		Loads a .korekshow file into this project; media lists stay as they are.

IN THE PANEL

Save this whole Virtual Production setup as a small file and load it into another project or on another computer: keying, placement, look, post process, bounce light, graphics, output, streaming destinations (never the stream keys), tracking, PTZ cameras, free shots and camera moves. Things that belong to one project stay with it: video screens and clips, lighting cues, the rundown, media and soun

Ray-traced quality (locked shots) RIGHT PANEL · SET TAB

For a shot whose camera does not move: the set is rendered once in ray-traced quality (true bounce light, reflections, soft shadows) and the live people are keyed in front of it.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Shot			The preview shot the plate is made for.
Quality	List: 32 samples (quick look) · 64 samples · 128 samples (good) · 256 samples · 512 samples (finest, slow) · 1024 samples (finest, slow)	128 samples (good)	How many light samples per pixel. More is cleaner and takes longer: 128 is good for most sets, 512 for glossy floors and dark corners. You can stop early and keep what is rendered.
Render this shot in ray-traced quality	Button		Renders the set once from this shot's camera with path tracing; it is shown behind the people while the camera does not move.

IN THE PANEL

For a shot whose camera does not move (a news desk, a talk show wide): the set is rendered once from that camera in ray-traced quality, with true bounce light, reflections and soft shadows, and the live people are keyed in front of it. If the camera moves, the live set comes back by itself.

Splat worlds (Gaussian splatting) RIGHT PANEL · SET TAB

A real place captured as Gaussian splats (.ply or .splat) shown as the world: the virtual camera moves through a photographed location.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
+ Splat file (.ply, .splat)	Button		Adds a captured place as a world (up to 4, 6 million splats each).

IN THE PANEL

A real place captured as Gaussian splats (a .ply or .splat file from Luma, Polycam, Postshot, Nerfstudio and others) becomes a world the virtual camera moves through. It moves, turns and scales with the Set.

Good to know: the people are always drawn in front of a splat world (it is a background, they cannot walk behind its objects yet), it does not catch their shadows, and the set's lights do not change it. Lower Detail if the picture gets slow.

Set (3D scene) RIGHT PANEL · SET TAB

Your 3D scene is the set. Move, turn or scale it around the talent, or build a ready-made set (news, talk show, sports, classroom…).

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Scale	Number 0.01 to 1000 ×	1 ×	Make the whole 3D set bigger or smaller around the talent (1 = real size).
Position	Number	0	Moves the whole set in the studio, metres.
Turn	Number °	0 °	Turns the whole set, degrees.
Show the set	Tick box	on	Shows or hides the set (people only, or with another background).

Set template	List: News studio · Talk show · Sports desk · Classroom / e-learning · Product launch · Corporate / webinar	News studio	A ready-made set: news, talk show, sports, classroom and more.
0.1× to 10×	Button		Scales the whole set by that factor.
Reset the set	Button		Back to position 0, turn 0, size 1.
Build	Button		Builds the chosen template into the scene.

IN THE PANEL

Anchor desk, curved back wall with a video wall, blue and white, three cameras. Adds to the scene (Ctrl+Z removes it); its cameras become shots. Every part is an ordinary object you can move and restyle. For a set of your own, describe it to the AI assistant, e.g. "A TV news studio set for virtual production: anchor desk, curved blue back wall, a large video wall, three cameras (wide, close, side)

Look and speed RIGHT PANEL · SET TAB

Render quality and exposure of the set, and the frame budget meter that shows if the computer keeps up with the output frame rate.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Render quality	List: 200% (supersampling, best) · 150% (supersampling) · 100% · 75% · 50% (fast) · 35% (fastest)	100%	Lower = faster on modest computers. Above 100% the picture is rendered bigger and scaled down (supersampling): the smoothest edges and finest detail, and the heaviest for the graphics card. The output size stays the same.
Anti-aliasing	List: MSAA + SMAA (best) · MSAA · SMAA · FXAA (fastest) · Off	MSAA	Smooth edges without jaggies. MSAA smooths the edges of objects (2×, 4× or 8× samples). SMAA and FXAA smooth every edge of the finished picture, including textures, thin lines and the keyed people (SMAA is sharper, FXAA is the fastest). MSAA + SMAA is the best quality. Combine with Render quality above 100% for the cleanest picture.
Render rate	List: Match the output (saves the graphics card) · Every screen refresh	Match the output (saves the graphics card)	Match the output: when the screen refreshes at 2× or 3× the show's frame rate (a 60 Hz screen and a 30 fps show), Korek renders only the frames the output needs. Same picture on air, half the work for the graphics card, so there is room for more quality. Every refresh: render at the screen's own rate.
MSAA samples	Choice: 2× · 4× · 8×	4×	Multisampling for smooth edges: 2, 4 or 8.
Exposure	Number -4 to 4 EV	0 EV	Overall exposure of the set, stops.
Shadows	Tick box	on	Shadows on or off (off is faster).
Floor reflections	Tick box	on	Mirror-like floor reflections on or off (each costs an extra render).
Preview monitor	Tick box	on	Renders the preview shot too, a few times a second.
Sky, fog, light and Film look	Button		Opens the Studio's Live look settings.
Show the heaviest objects	Button		Lists the objects that cost most to draw.

Global illumination (bounce light) RIGHT PANEL · SET TAB

Real-time bounce light on the set, like Lumen: light reflects from surfaces onto other surfaces. Clean (no grain), with settings for density, smoothness, leaks and speed.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Global illumination on the set	Tick box	off	Real-time bounce light on the set.

IN THE PANEL

Light bounces off the set in real time, like Lumen: a sunlit floor lights the ceiling, a red wall tints the floor next to it, and rooms are lit by what really comes in through their openings. Clean with no grain, because it is read from a grid of light probes, not random rays.

Background RIGHT PANEL · SET TAB

Put a video behind the talent instead of the 3D set, for example Unreal Engine's picture or another machine's output.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Background	Choice: Korek 3D set · Video input · 360 world	Korek 3D set	What is behind everything: the Korek 3D set, a video input (Unreal, another machine), or a 360 world.
Input	List: Choose… · Camera / capture card · Screen or window… · Sample presenter (green screen) · Video file… · Guest 1 · Guest 2 · Guest 3 · Guest 4 · Guest 5 …	Choose…	The video input used as the background.
Hold back	Number 0 to 15 frames	0 frames	Shows the background this many frames late. Use it when the background arrives EARLIER than the camera picture. When it arrives later (the usual case with another engine over the network), delay the camera instead: Talent and inputs, Delay.
Depth input	List: None · Camera / capture card · Screen or window… · Sample presenter (green screen) · Video file… · Guest 1 · Guest 2 · Guest 3 · Guest 4 · Guest 5 …	None	A second input carrying the background's depth picture, so people go behind its objects.
The people cast a shadow on the background's floor	Tick box	off	A shadow floor at the given height catches the people's shadows over the video background.
Or live	List: Choose an input… · Camera / capture card · Screen or window… · Guest 1 · Guest 2 · Guest 3 · Guest 4 · Guest 5 · Guest 6 · Guest 7 …	Choose an input…	A live 360 camera (in equirectangular mode) as a webcam or capture input.
Floor height	Number -20 to 20 m	0 m	Where the floor of the 360 picture is, in metres (0 = the studio floor). Raise or lower it until the feet sit on the 360 floor.
Sun	Choice: Found in the 360 · By hand	Found in the 360	For the 360 world: no sun, or a sun that casts the people's shadows.
Sun colour	Colour	#fff4e0	Colour of that sun.

Rotate the view (°)	`Slider -180 to 180`	`0`	Turns the 360 world round you, to choose what is behind the people.
Brightness	`Slider 0 to 4`	`1`	Brightness of the 360 picture.
Light strength	`Slider 0 to 3`	`1`	How strongly the 360 picture lights the set and people.
Shadow	`Slider 0 to 1`	`0.55`	Darkness of the people's shadows on the 360 floor.
Shadow softness	`Slider 0 to 1`	`0.25`	Blur of those shadows.
Reflection	`Slider 0 to 1`	`0.25`	Strength of the people's reflection on the 360 floor.
Sun direction (°)	`Slider -180 to 180`	`45`	Where the sun is round you; sets where the shadows fall.
Sun height (°)	`Slider 2 to 89`	`40`	How high the sun is; low makes long shadows.
Sun strength	`Slider 0 to 8`	`2.5`	Brightness of the sun.
Light the set from the 360 picture	`Tick box`	`on`	The 360 picture lights the set's objects and the people.
Show the 3D set's objects too (a desk, a screen)	`Tick box`	`off`	Keeps the set's objects inside the 360 world.
Choose a 360 clip or photo	`Button`		Picks the 360 video or photo (equirectangular, 2:1).

IN THE PANEL

Use the picture of Unreal Engine, Aximmetry or another machine (NDI, capture card, screen) behind the keyed talent. Send the camera to it below so both match.

A second picture from Unreal (or another engine) that carries distance as brightness. With it, people go behind the engine's objects by themselves: a column, a desk, a car.

A 360 video or photo (equirectangular, 2:1, from an Insta360, a GoPro Max, a 360 stock clip or a render) all around the camera. The talents stand in it, lit by it, with their shadow and reflection on its floor.

Rotate turns the 360 picture around you, like turning on the spot, to choose what is behind the people. The horizon stays level.

Reflection mirrors the people (and any set objects) in the 360 floor: raise it for a polished or wet floor, 0 for none. The floor is invisible: only the shadows and the reflections show over the 360 picture. Each talent's feet lock and contact shadow (Place in the world) still apply.

Sun direction turns the shadows round the people; sun height makes them shorter (high) or longer (low). Moving either one places the sun by hand.

Found in the 360: the sun is placed at the brightest spot of the 360 sky and follows it. Shadows need Shadows on under Look and speed.

Unreal Engine RIGHT PANEL · SET TAB

Work with Unreal: export the set to Unreal, send it the tracked camera (desktop app) and use Unreal's picture as the background.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Unreal computer	`Text`	`127.0.0.1`	Address of the computer running Unreal.
Port	`Number 1 to 65535`	`40000`	Its FreeD port (default 40000).
Camera ID	`Number 1 to 255`	`1`	The FreeD camera number Unreal listens for.
Send the program camera to Unreal Engine	`Tick box`	`off`	Sends Korek's program camera as FreeD, so Unreal renders the same view.

Export set for Unreal (GLB)	Button	Saves the set as a GLB file to import into Unreal.
Use Unreal as background	Button	Switches the background to a video input for Unreal's picture.

VR and AR RIGHT PANEL · SET TAB

Walk inside the set with a VR headset, or put it on a table with a phone in AR, to check the set before the shoot.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
AR size	List: 1:1 (real size) · 1:2 · 1:5 · 1:10 · 1:20 · 1:50 · 1:100	1:50	How big the set appears on the table (1:50 = a 10 m studio is 20 cm).
VR size	List: 2× bigger · Real size · 1:2 model · 1:5 model · 1:10 model	Real size	1 = walk in the real-size set; smaller = see it as a model, bigger = a giant set.
Walk speed	Number 0.5 to 10 m/s	2 m/s	Movement speed in VR, metres per second.
Snap turning (comfortable)	Tick box	on	Turns in steps instead of smoothly, which avoids motion sickness.
Start where the program camera is	Tick box	on	The headset starts at the program camera's position.
Enter VR	Button		Opens the set in a VR headset.
Enter AR	Button		Places the set in the room through an AR device.

IN THE PANEL

In AR, tap a surface to place the set; the on-screen buttons scale, turn and lift it. In VR: left stick walks, right stick turns.

Film colour (log, HDR, ACES) RIGHT PANEL · OUTPUT TAB

Renders in 16-bit linear light, decodes each camera from its own log curve and gamut, and encodes the master once in Rec.709, HDR (HLG / PQ), ACEScct or a camera log, so the virtual set grades together with the camera footage.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Film pipeline on	Tick box	off	Linear-light rendering with camera colour in and a 10-bit master out (E4).

IN THE PANEL

Renders in linear light (16-bit float) and encodes the picture once, at the end, the way the production needs it: Rec.709, HDR, ACES or a camera log that cuts with the camera's own footage in the grade.

Depth of field RIGHT PANEL · CAMERAS TAB

Soft focus on the virtual set exactly like the real lens: focal length from the zoom, your T-stop and sensor, focus following a talent, set by hand or read from the lens encoder.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Depth of field	Tick box	off	Lens blur from the real lens' focal length, T-stop and focus.

IN THE PANEL

The virtual set goes soft in front of and behind the focus distance, exactly as much as the real lens would (focal length from the camera's zoom, your T-stop and sensor). Off on the LED wall: the real lens blurs the wall itself.

Lens matching RIGHT PANEL · CAMERAS TAB

Real lenses bend straight lines a little. Calibrate the lens so the virtual set bends the same way as the camera picture.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Wide: k1 / k2	Number -0.3 to 0.3	-0.06 · 0.005	Distortion coefficients at the wide end of the zoom.
Tele: k1 / k2	Number -0.3 to 0.3	-0.01 · 0	Distortion coefficients at the tele end; values between are interpolated by the zoom.
Centre shift	Number -0.3 to 0.3	0	The lens' optical centre offset from the picture centre.
Match the real lens (barrel / pincushion)	Tick box	off	Bends the virtual picture like the real lens.
Calibration grid	Tick box	off	Draws a grid to match the distortion against a real grid.

IN THE PANEL

Point the camera at straight lines (a door, a window frame) near the picture's edge. With the grid on, change k1 until the grid bends like the real lines; do it zoomed out (wide) and zoomed in (tele). The zoom from tracking picks between them.

Cluster (several computers) RIGHT PANEL · CAMERAS TAB

Share the work between computers: one renders the program, others render shots or parts of an LED wall (the network link needs the desktop app).

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Link	List: Network (desktop app) · Windows on this computer	Windows on this computer	How the computers are linked.
This node	Text	Node 42	This node's name.
Renders	List: The program (backup / extra output) · One camera shot (ISO feed) · An LED-wall section	The program (backup / extra output)	What this node renders: the program, the preview, or its own LED wall section.
Cluster mode	Choice: Off · Main computer · Render node	Off	Off, Main (this computer runs the show) or Node (renders one output for the main computer).

IN THE PANEL

The main computer runs the switcher, tracking and settings; every node gets the project and all changes live and renders its own output in step. Video inputs are each computer's own (feed the same camera to each node).

Graphics RIGHT PANEL · SHOW TAB

Titles on top of the program: lower third, logo, clock, ticker, scoreboard, information box and live data from a web address.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Accent	Colour	#ff7a1a	Accent colour of the lower third and the information box.
Every	Number 1 to 3600 s	5 s	How often the address is read, seconds.
Lower third	Tick box	off	Name strap at the bottom left, sliding in and out.
Logo	Tick box	off	Shows the logo bug.
Clock	Tick box	off	Time of day, top right (or top left beside a top-right logo).
LIVE bug	Tick box	off	Red LIVE label, top left.
News ticker	Tick box	off	Scrolling text at the bottom.
Show the scoreboard	Tick box	off	Score bar at the top centre.
Show the information box	Tick box	off	A box with a title and one item per line.
Read the data address	Tick box	off	Reads the JSON or CSV address every few seconds for {{name}} values.
Logo corner	List: Top left · Top right · Bottom left · Bottom right	Top right	Which corner the logo sits in.
Ticker text	Text	Breaking news · Korek 3D Studio virtual production	The ticker's text. Accepts {{data}}.
Home colour / Away colour	Colour	#d42a2a	Team colours.
Info box lines	Text	Item one 45% Item two 38% Item three 17%	One item per line.
Info box corner	List: Top left · Top right · Bottom left · Bottom right	Top right	Which corner the box sits in.
Lower third title	Text	Guest name	First line (name). Accepts {{data}}.
Lower third subtitle	Text	Title or topic	Second line (title or topic). Accepts {{data}}.
Home team / Away team / Home score / Away score / Period / Game clock	Text	HOME	The scoreboard's fields. Each accepts {{data}}.
Info box title	Text	Results	The box's title.
Data address	Text	https://… (.json or .csv)	A JSON or CSV address (a scores feed, a published sheet).
Choose logo	Button		Picks the logo picture (PNG with transparency recommended, up to 1.4 MB).

IN THE PANEL

Any text above can show live values: write {{name}} (or {{name|fallback}}). Values come from a JSON or CSV address (scores, results, prices, a published sheet) and from the remote / HTTP API.

Custom graphics and AR RIGHT PANEL · SHOW TAB

Your own graphics: a design made in any program (picture or video) with text boxes, results tables, bar charts and team line-ups. On the screen, or standing in the 3D world as AR, each with a button to take it in and out.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Your design / Table / Bar chart / Line-up / Weather / Match-up / Set object	Button		Adds a graphic of that kind (up to 40). Your design asks for the artwork file.
+ Font file	Button		Adds a TTF, OTF, WOFF or WOFF2 font to the show (up to 12).
Name	Text	Table 1	The name on its button. Macros, the rundown and the remote control use it too: item.NAME.on
Where	Choice: On the screen · In the world (AR)	On the screen	On the screen: over the picture, like a lower third. In the world (AR): it stands in the 3D set, the cameras see it in perspective and people can walk in front of it.
Comes in	List: Cut · Fade · Slide from the left · Slide from the right · Rise from below · Drop from above · Grow · Wipe · Number 0 to 10 s	Rise from below · 0.6 s	The entrance (cut, fade, slide from left or right, rise, drop, grow, wipe) and its time.
Title	Text	Top scorers	The data graphic's title. Accepts {{data}}.
Columns	Text	Player, Apps, Goals	The names over the columns, with commas between them.
Colours	Colour	#e5383b · #141a26 · #ffffff	Accent, panel and text colours (and the second side's colour for a match-up).
Across	Slider 0 to 1	0.5	On the screen: the graphic's centre, 0 = left edge, 1 = right edge.
Up / down	Slider 0 to 1	0.5	On the screen: the graphic's centre, 0 = top, 1 = bottom.
Size	Slider 0.05 to 1.5	0.6	On the screen: the graphic's height as a part of the picture height.
Opacity	Slider 0 to 1	1	How solid the graphic is.
Graphic rows	Text	Player one, 171, 96 Player two, 78, 55 Player three, 101, 41	The data: one row per line, cells separated by commas.
Your own background	Button		A picture behind the data graphic instead of the drawn panel.
+ Text	Button		Adds a text box to the graphic (up to 24).
Duplicate	Button		Copies the graphic.
Delete this graphic	Button		Removes the graphic.
Full bar at	Number 0 to any	0	The value that makes a full-height bar. 0 = the biggest value in the list.
Unit	Text	%	Written after each value (%, °).

Formation	List: 4-4-2 · 4-3-3 · 4-2-3-1 · 3-5-2 · 3-4-3 · 5-3-2 · 4-1-4-1 · 4-5-1 · 5-4-1	4-3-3	The line-up formation, goalkeeper not counted.
Player buttons	Button		Add this player's photo
Left side logo / Right side logo	Button		Match-up: each side's logo picture.
Object	List: Choose an object… · Box 01 · Sphere 01	Choose an object…	Any object of your 3D set: a logo, a trophy, a 3D title, a model you imported. It stays hidden until you take this graphic in, then comes in with the entrance below, right where it stands in the set.
Box name	Text	Text 1	Macros and the remote control change this text by its name: item.GRAPHIC.BOX NAME
Look	Colour · List: Regular · Semi-bold · Bold · List: Left · Centre · Right	#ffffff · Semi-bold · Centre	Text colour, weight and alignment.
Font	List: Standard	Standard	The text box's font: standard or one of the show's fonts.
Widest	Slider 0 to 1	0	The widest the text may be; longer text is squeezed to fit (0 = no limit).
CAPITALS	Tick box	off	Writes the text in capitals.
Shadow	Tick box	off	A soft shadow behind the text.
Text box text	Text	Name	The text. Accepts {{data}}.
Text n	Button		Selects that text box for editing; drag it in the preview to move it.
Delete this text	Button		Removes the text box.
Position	Number m	0 m · -4 m	In the world: where the graphic's base stands, studio metres.
Height	Number 0.05 to 100 m	1.6 m	In the world: the graphic's height, metres (for a line-up, the pitch length).
Turn	Number -360 to 360 °	0 °	In the world: turn about the vertical, degrees.
Brightness	Slider 0.2 to 3	1	In the world: brightness of the graphic (it is not lit by the set).
Always turned to the camera	Tick box	off	In the world: the graphic always faces the program camera.
Casts a shadow on the set	Tick box	on	In the world: the graphic casts a shadow.
Put it in front of the camera	Button		Places the graphic on the floor in front of the program camera, turned to it.

IN THE PANEL

Your own graphics: a design made in any program (a picture, or a video with transparency) with text you type here, or a table, a bar chart or a line-up. Put each on the screen or stand it in the world as AR.

Buttons, macros and the rundown can take a graphic in and out (Gallery, Macros). From the remote control or another system: /api/graphics?item.NAME.on=true, and item.NAME.BOX NAME=New text changes a text.

One row per line, with commas between the columns. Live data works here too: {{name}}.

One bar per line: name, value. Live data works here too: {{name}}.

One player per line: shirt number, name. The first is the goalkeeper, then the back line from one side to the other, and so on up the pitch. Live data works here too: {{name}}.

Click a player to add a photo (a cut-out PNG looks best).

One day per line: day, sky, high, low. Sky words: sunny, partly cloudy, cloudy, rain, storm, snow, wind, fog, night. Live data works here too: {{name}}.

First two lines: each side and its score. Then one line per number: name, left side, right side. Live data works here too: {{name}}.

Talent view and teleprompter RIGHT PANEL · SHOW TAB

A screen for the presenter to see themselves in the set, with a teleprompter for the script.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Speed	Number 0 to 600	60	Teleprompter scroll speed.
Text size	Number 16 to 200	64	Prompter text size.
Prompter height	Number 0.15 to 0.9	0.38	How much of the talent view the prompter band takes.
Mirror the text (beam-splitter glass)	Tick box	off	Mirrors the text for a prompter with a beam-splitter glass.
Mirror the picture	Tick box	on	Mirrors the program in the talent view, so moving left looks like left.
Safe areas	Tick box	on	Shows the title and action safe frames.
Floor marks	Tick box	on	Shows the talent's marks on the floor.
Prompter script	Text	Good evening and welcome. Type or paste the script here. Space starts and stops	The script.
Open the talent view	Button		Opens the talent's monitor window (put it on the floor monitor).
Run	Button		Starts or stops the prompter.
Back to top	Button		Prompter back to the start.

IN THE PANEL

For the monitor the presenter watches: the program (mirrored), safe areas, floor marks and the prompter. Double-click it for full screen; Space starts and stops the prompter there.

Pro recording (ProRes, DNxHR) RIGHT PANEL · OUTPUT TAB

Record a 10-bit master file (Apple ProRes 422 HQ or 4444, Avid DNxHR HQX) with timecode and colour tags, in the desktop app.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Format	List: Browser recording (H.264 / WebM, 8-bit) · Apple ProRes 422 HQ (10-bit) · Apple ProRes 4444 (10-bit 4:4:4) · Avid DNxHR HQX (10-bit)	Apple ProRes 422 HQ (10-bit)	ProRes 422 HQ: the usual on-set and editing master (about 180 Mb/s at 1080p25). ProRes 4444: full colour detail for keying and VFX. DNxHR HQX: the 10-bit choice for Avid.
Save to			The folder recordings are written to.
Record sound (24-bit PCM in the file)	Tick box	on	Puts the programme sound in the file as 24-bit PCM.

IN THE PANEL

Record button: a 10-bit master file straight from the engine, with the studio timecode and the colour tags of the master. Use it as the master or as a safety recording next to the Ki Pro / HyperDeck.

ProRes and DNxHR recording works in the Korek 3D Studio desktop app. In the browser the Record button makes an H.264 / WebM file.

The film pipeline is off: the master is Rec.709 (sRGB curve), 10-bit. Turn on Film colour for HDR, ACES or camera log.

Recorders and timecode RIGHT PANEL · OUTPUT TAB

Start and stop AJA Ki Pro and Blackmagic HyperDeck recorders with Korek, and read their timecode to stamp the camera data (desktop app).

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
+ Ki Pro / + HyperDeck	Button		Adds an AJA Ki Pro or a Blackmagic HyperDeck, started and stopped with Korek.

IN THE PANEL

Start and stop the studio's recorders with Korek, and stamp the camera data with their timecode so it lines up with the clips in post. For a Ki Pro group, add the group leader: it starts all its followers.

Controlling recorders works in the Korek 3D Studio desktop app (the browser cannot reach them). You can set the list up here; it is saved with the project.

Camera data (for post) RIGHT PANEL · CAMERAS TAB

Records the program camera move frame by frame and exports it for Nuke, After Effects, Blender or Unreal, to finish the shot in post.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Record camera data only	Button		Records the camera data without a video file.

IN THE PANEL

Every recording also records the program camera (position, direction, zoom) frame by frame, to finish the shot in Nuke, After Effects, Blender or Unreal with the same camera.

Remote control and API RIGHT PANEL · SHOW TAB

Run the switcher from a phone or tablet, a Stream Deck or newsroom scripts over the network (desktop app).

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Port	Number 1024 to 65535	7351	The HTTP port of the remote and the API (default 7351).
Start the remote	Button		Starts the remote server; the panel shows the addresses and the key.

IN THE PANEL

Run the show from a phone or tablet on the same network, or from Bitfocus Companion / Stream Deck and newsroom scripts over HTTP. (In the desktop app.)

Commands: /api/take?shot=Wide · /api/cut · /api/preview · /api/graphics?lowerThird.on=true&lowerThird.title= · /api/vars?home.score=3 · /api/prompter?action=play · /api/record?action=start · /api/state (each with ?key=). Full MOS newsroom integration is not built in.

Camera tracking RIGHT PANEL · CAMERAS TAB

Moves the virtual camera with the real one using FreeD data from a tracking system or PTZ camera (desktop app), so the set stays locked to the floor.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
UDP port	Number 1024 to 65535	40000	Port FreeD arrives on (default 40000).
Origin	Number	0	Where the tracking origin sits in the world, metres.
Turn	Number °	0 °	The tracking system's turn against the world, degrees.
Lens wide / tele	Number mm	18 mm · 120 mm	Raw zoom counts and focal lengths at wide and tele (E6).
Video delay	Number 0 to 20 frames	2 frames	Holds the virtual camera back this many frames to match the video.
Tracking	Choice: Off · FreeD (UDP) · Simulator	Off	Off, FreeD over UDP, or the built-in simulator.

IN THE PANEL

Live FreeD tracking (Mo-Sys, Stype, Ncam, PTZ cameras) runs in the desktop app; the simulator works everywhere.

Tracked cameras and cranes RIGHT PANEL · CAMERAS TAB

Several real cameras with their own tracking (a crane, pedestals, handhelds): each has a camera ID, its lens, where it stands and its own picture. Switch between them like shots.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
+ Tracked camera	Button		Adds a tracked shot with its own FreeD camera ID and calibration.
+ Crane / jib	Button		Adds a crane or jib shot.

IN THE PANEL

Each real camera (on a tripod, pedestal, Steadicam or crane) has its own tracking: set the camera ID its tracking system sends (FreeD), its lens, where it stands, and which camera input is its picture. Switch between them like any shot. All cameras can send to the same port.

Optical tracking (no hardware) RIGHT PANEL · CAMERAS TAB

Tracks the camera from printed markers on the wall or ceiling, using only the camera picture. No tracking hardware needed.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Camera	List: First talent input · Talent 1 · Demo camera (try it without a camera)	First talent input	The input whose picture is tracked.
Smoothing	Number 0 to 1	0.5	0 = raw, 1 = very steady (more lag).
Detail	List: Fast (640 px) · Balanced (960 px) · Precise (1280 px)	Balanced (960 px)	Processing width: more is steadier and slower.
Field of view	Number 5 to 140 °	50 °	The camera's field of view, degrees; set by Calibrate the lens.
Track the camera from markers	Tick box	off	Solves the camera pose from printed markers in its own picture.
Green markers (disappear in the green-screen key)	Tick box	off	Markers printed in two greens, removed by the key.
Follow the zoom (2+ markers in view)	Tick box	off	Solves the zoom every frame.
Marker layout	List: Back wall + side walls + floor (best) · Back wall only (6 markers) · Ceiling grid (big cameras moves)	Back wall + side walls + floor (best)	A ready-made layout for the markers.
Marker n facing	List: Back wall · Left wall · Right wall · Floor · Ceiling	Back wall	Which wall or floor the marker is on.
Calibrate the lens	Button		Move the camera round the markers, then press: sets field of view and distortion.
Use layout	Button		Replaces the marker list with the chosen layout.
Add marker	Button		Adds a marker (ID, centre X Y Z, facing, printed size).
Print markers	Button		Opens the markers ready to print at their real size.

IN THE PANEL

Track the camera from printed Korek markers in its own picture: no tracking hardware. Print the markers, put them where the list says, choose the camera.

Best results: markers at different depths (back wall, side walls, floor), 3 or more in every shot, matte paper, even light. Positions are the marker centres in metres from the studio origin (floor = Z 0). Every marker id once.

LED wall (XR) RIGHT PANEL · SET TAB

Shows the set on an LED wall behind the talent with the right perspective from the tracked camera, with colour matching and a moiré check.

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Wall centre	Number	0 · 3 · 2	Centre of the wall in studio space, metres.
Size	Number 0.5 to any m	8 m · 4 m	Width (along the curve for a curved wall) and height, metres.
Turn	Number °	0 °	The wall's turn, degrees.
Curve	Number -300 to 300 °	0 °	For a wall that wraps round the stage: how many degrees it turns from one end to the other (0 = a flat wall). The width above is then the length along the curve. A minus value curves away from the stage.
Gains R G B	Number	1	Per-channel gains to match the LED processor.
Pixel pitch	Number 0.5 to 40 mm	2.6 mm	Moiré check: the wall's LED pitch, mm.
Camera to wall	Number 0.3 to 100 m	4 m	Moiré check: distance from camera to wall, m.
Focus at	Number 0.01 to any m	2.5 m	Moiré check: focus distance, m.
Lens	Number 8 to 600 mm · Number 0.7 to 32	35 mm · 2.8	Moiré check: focal length and f-number.
Sensor	Number 4 to 70 mm · Number 640 to 17000 px	35.9 mm · 6048 px	Moiré check: sensor width (mm) and pixels across.
Output the LED wall view	Tick box	off	The program shows the inner frustum for the LED wall.
Colour correct the output	Tick box	off	Applies the gains and LUT below.
Colour on	Choice: LED wall output · Everything	LED wall output	The LED wall output only, or everything.
Load .cube LUT	Button		Loads a 3D LUT (.cube, up to 8 MB).
Sections	Number 2 to 24	8	The curve is drawn as this many flat sections side by side. Use the number of cabinet columns of the wall (the cabinets are flat too), or 8 to 12 for a smooth look. More sections cost more speed.

IN THE PANEL

The program shows what the LED wall must display so the set looks right from the (tracked) camera: the inner frustum.

Low risk · LED pixel on the sensor 23.0 µm, sensor pixel 5.9 µm, wall blur 66.6 µm

Radius 5.09 m · 7.20 m straight across between the two ends · 1.49 m deep. The output is the wall unrolled flat, section by section, the way an LED processor maps it.

SDI output RIGHT PANEL · OUTPUT TAB

The program on SDI through an AJA or Blackmagic DeckLink card, 10-bit, genlocked to the studio reference (desktop app).

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Brand	Choice: AJA · Blackmagic DeckLink	AJA	AJA: KONA, Io, Corvid with the AJA driver (AJA Desktop Software). Blackmagic: DeckLink and UltraStudio with Blackmagic Desktop Video installed.
Card	List: First AJA card	First AJA card	The card that plays out.
SDI out	List: SDI 1 · SDI 2 · SDI 3 · SDI 4	SDI 1	Which SDI connector (channel) carries the program.

Sync	Choice: House ref · Free run	House ref	House reference: the card locks to the black burst / tri-level on its REF input (genlock). Free run: the card's own clock (no reference connected).
Scan	Choice: p · PsF · i	p	Progressive, progressive segmented frame (PsF) or interlaced, as the switcher expects (1080 only for PsF and interlaced).
SDI output	Tick box	off	Sends the master to an AJA or DeckLink card.

IN THE PANEL

The program straight out of an SDI card, 10-bit YCbCr 4:2:2, locked to the studio's reference (black burst or tri-level) so it cuts cleanly with the cameras in the switcher. Works with AJA (KONA, Io, Corvid) and Blackmagic DeckLink (DeckLink, UltraStudio) cards.

SDI output works in the Korek 3D Studio desktop app on a computer with an AJA card and the AJA driver (AJA Desktop Software) installed.

Output RIGHT PANEL · OUTPUT TAB

The finished program: resolution, frame rate and NDI output to the studio network (desktop app).

CONTROL	TYPE	NEW PROJECT	WHAT IT DOES
Resolution	List: 1280 × 720 · 1920 × 1080 · 2560 × 1440 · 3840 × 2160 · 1080 × 1920 (vertical)	1920 × 1080	Output size: HD, UHD and others.
Frame rate	List: 23.976 fps · 24 fps · 25 fps · 29.97 fps · 30 fps · 50 fps · 59.94 fps · 60 fps	30 fps	23.976, 24, 25, 29.97, 30, 50, 59.94 or 60.
NDI name	Text	Korek Program	The source name seen on the network.
Also record each camera input on its own (ISO)	Tick box	off	Records every camera input alongside the program.
Also record separate layers for post (background, people, matte)	Tick box	off	Records the three layers with every take.
NDI® output	Tick box	off	Sends the program as an NDI source.
Frame-locked (NDI clocks the frames to the frame rate)	Tick box	on	NDI paces the frames to the exact output rate.
Background / People and matte	Tick box	on	Which layers are recorded.
Their shadows in the background	Tick box	on	The people's shadows on the set stay in the background layer. Untick for a clean set with no trace of them.
Show the layers	Tick box	off	Shows the three layers live to check them.

IN THE PANEL

Also: capture the Program window in OBS or vMix. NDI® is a registered trademark of Vizrt NDI AB.

Each layer is drawn again every frame: about 4 times the work of the program alone while you record or show them. Watch the frame budget. The layers are the picture before post process, depth of field and graphics, saved as high-quality video files (not ProRes in this version). Things of the set in front of a person are in the background layer, and the matte is already cut by them.

⚠ NDI output needs the Korek 3D Studio desktop app