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The definitive creative solution for desktop paint, compositing, and visual effects. Autodesk® Combustion® 4 is the all-in-one professional compositing application designed to enable the full creative potential of digital video artists.

With its easy-to-use interface, nondestructive workflow, and extensive toolset, Combustion delivers incredible power at a "must-have" price and instantly augments the creative potential of any serious desktop video artist.

Key New Version 4 Features
- Diamond Keyer—high-precision keying technology inherited from the Academy Award®-winning Discreet® Flame® visual effects system.[1]
- Timewarp, the fully key-framable, time-remapping operator for creating slow-motion and speed-up effects.
- B-spline shapes with control point grouping for faster, more accurate rotoscoping.
- Fast GBlur, an optimized, high-quality blur filter with constant-speed rendering independent of blur radius.

- High-quality resize includes Lanczos and Mitchell filter options.
- Capsules organize your creative workspace by grouping multiple operators into single customizable Capsule nodes.
- GBuffer Builder can custom combine your image bitmaps into RPF files for use with Combustion software's 3D Post operators.
- Merge operator offers faster, simpler compositing using a variety of transfer modes.
- Grids, guides, and rulers provide visual cues for accurately aligning, transforming, and measuring elements in a scene.
- Command line rendering to quickly launch rendering tasks outside of Combustion.
- ASE file support—import target cameras from Autodesk® 3ds Max®.
- Import Windows Media® Video 9 and 10 files.
- Export OpenEXR file sequences.

Image courtesy of Martin Square Productions

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Other Key Combustion Features
- Single integrated application for vector paint, motion graphics design, animation, and compositing.
- Full 3D compositing environment.
- Advanced visual effects tools—keying, color correction, tracking, grain management, and masking tools inherited from the Academy Award–winning Flame visual effects system.[1]
- Edit Operator—break free from your NLE and assemble clips complete with transitions right in Combustion.
- Rich set of effects tools: including a fully integrated, interactive particle system, warping and morphing, and 3D Post filters.
- Comprehensive paint and rotoscoping tools, including fully customizable brushes.
- Comprehensive animation tools, animation curve editor, keyframing, and expressions.
- Intuitive schematic view to simplify visualization and organization of complex effects.
- OpenGL acceleration, multiprocessor support, and extensive caching for improved system performance.
- Multiple simultaneous viewports with real-time RAM looped playback.
- Resolution-independent with 8-, 10-, 12-, 16-, and 32-bit (float) per component image processing.

Composite
- **New** • Merge operator to quickly composite two inputs using any one of a variety of transfer modes.
- True 3D perspective positioning and animation.
- True 3D animatable camera with real-world camera attributes.
- Unlimited color light sources, with attributes like "spot," "point," and "distant light."
- Realistic ray-traced shadows and reflections.
- Layer projection to create stained glass–type lighting effects.
- High-quality Motion Blur with multiple transfer modes.
- Multiple object parenting, hinging, and path alignment for advanced motion path hierarchies.
- Unlimited layers per composite; nest multiple layers inside a composite for greater efficiency.

Paint
- **New** • B-splines with edge softness for greater control when defining shapes.
- **New** • Control point grouping to facilitate roto work and shape animation.
- **New** • Blend colors in the color mixer using an image as a source.
- **New** • Corner Radius specifies corner curvature when creating rectangles.
- **New** • Integrated pivot point adjustment and rotation directly in vector object.

- Real-Time Roto—paint in one viewport while watching the result loop-playback in another.
- Vector-based: all paint strokes and objects are resolution-independent vectors and fully editable.
- Pressure-sensitive painting and drawing tools.
- 30+ real-time draw modes, including smooth, brightness, blur, emboss, and more.
- Cloning and reveal controls for interactive painting between video clips and frames.
- Custom brushes enable you to create unique tools for advanced effects and textures.
- Flash.swf output offers expanded web design capabilities.

New Capsules
- Create custom Capsule operators by combining multiple operators in the schematic.
- Configurable UI to expose only the operator parameters you require.
- Accepts multiple inputs for quickly creating frequently used effects.
- Inputs can be named to clearly define source elements expected by the Capsule.
- Capsule Notes allow you to explain Capsule functions to facilitate collaboration.
- Save Capsules to import them as operators in other workspaces.

Edit Operator
- **New** • Simultaneously trim head and tail (maintains duration).
- **New** • Current and total duration displayed in the timeline segment.
- **New** • Create duplicate segments in the timeline.
- Assemble clips, render them, or use them as layers in a composite.
- Trim, slip, slide, and ripple clips with transitions.
- In-context editing between the edit operator and your composites.
- Use multiple edit operators to easily create complex effects.
- Full support for multiple resolutions—mix and match clips as needed.

Character Generation and Text Effects
- Fast, interactive text editor for resolution-independent, nondestructive text animation.
- Direct WYSIWYG manipulation of text within the context of the overall composite.
- Font attributes (face, outline, shadow) have individual color, gradient, and texture controls.
- Individual control of phrases, words, and even single characters for precise editing and animation.
- Animate text along a path, with full onscreen editing of path control points.
- Edit and animate vector outlines of text characters.
- Support for Adobe® PostScript® and TrueType® fonts; international right-left, vertical text entry; double-byte (Asian, Arabic) fonts.
- Generators for creating frame counters, timecode burn-in, sequential, and random numbers.

Particle System
- Real-time particle system for creating smoke, fire, explosions, water, and other effects.
- Includes a library of hundreds of preset effects, each one fully customizable.
- Create your own particle effects using sprites created from custom bitmaps, or use any element in the Combustion workspace as a particle, such as text or paint objects.
- Use deflectors to bounce particles during animations.

Image courtesy of Budget Monks Production/Broken Saints

- Motion track emitters to lock particle effects to moving objects in an image sequence.
- Control the color, emission, and behavior properties of the particles including direction, life, number, spin, bounce, velocity, randomness, and other parameters.

New Timewarp
- Time-remapping operator for creating slow-motion and speed-up effects.
- Timing, Speed, and Duration controls for advanced manipulation of speed changes.
- User-definable between-frame interpolation to create smooth blends or trails.

Expressions
- New • Quick Pick for specifying relative paths when linking expressions.
- Use JavaScript expressions to create complex animations without keyframing each value.
- Expression Browser makes it easy to visualize, explore, and modify expressions from more than 30 preset expression classes.
- Quick Pick functions to easily link behavior of different parameters together.
- Convert expressions to key frames for fine-tuning of your animations.

Selections and Masks
- New • B-spline shapes for smoother control of edges when creating masks.
- Create animatable, trackable shapes using Bezier, B-spline, Freehand, Rectangle, and Ellipse tools.
- Animatable magic wand: keyframe or track the magic wand selection point.
- Keyer-based selection for advanced color-based extraction and rotoscoping.
- Edge gradient: a powerful three-spline rotoscoping technology for variable-edge softness. Inner and outer mask or selection softness for motion blur compensation.
- Boolean operations for combining masks and selections, including add, subtract, intersect, and replace.
- Create multiple and articulated shapes in a single pass for faster rotoscoping.

Keying
- New • Diamond Keyer: an advanced proprietary keying algorithm for pulling precise keys fast.
- High-quality, professional blue/green screen keying with advanced matte control tools.
- Intuitive Keyer (RGB, YUV, HLS, Channel, Luminance, RGB-CMYL, and custom).
- Matte edge and softness controls, including levels, shrink and erode, and Gaussian blur.
- Advanced spill and color suppression controls.

Color Correction
- Comprehensive color correction tools, including Color Balance, Brightness/Contrast, Levels, Gamma, Equalize, Tint, Curves, Shadow/Midtone/Highlight adjustment, and more.
- NTSC and PAL color limiting and RGB and HSV color space models.
- Precise and automatic color matching of footage from different sources.

Motion Tracking
- High-performance, high-precision tracking technology.
- Four-corner pinning and image stabilization to remove unwanted camera roll, shake, and jitter.
- Unlimited number of track points for complex changes in position, scale, and rotation.
- Any keyframable parameter can be animated using the tracker in context.
- Export tracking data to other compositing systems as ASCII data.

Advanced Film Tools
- New • Export OpenEXR file sequences for easy integration into film pipelines.
- Look-Up Tables (LUTs) allow artists to accurately display digital film scans on computer monitors.
- Add Grain and Remove Grain filters include automatic grain matching with presets for popular film stocks.
- Native 10-bit Cineon support—paint or rotoscope directly in 10-bit log without conversion.
- Supports 32-bit (float) per component for full floating-point accuracy.

Audio
- Supports QuickTime®, AVI, WAV, and AIFF files.
- Synchronize audio to any operator in the process tree, or use as a global reference track.
- Display the audio waveform over the timeline for accurate synchronization.
- Simultaneously play audio in real time with cached animation.
- Volume controls and VU/Peak meters.

Filters and Plug-Ins
- New • Fast GBlur, an optimized, high-quality blur filter with constant-speed rendering independent of blur radius.
- New • GBuffer Builder can custom combine your image bitmaps into RPF files for use with Combustion software's 3D Post operators.
- RE:Vision Effects' RE:Flex plug-in fully integrated for superior warping and morphing capabilities.
- 3D Post effects for RPF/RLA images, including 3D depth of field, 3D fog, 3D glow, 3D lens flare, and 3D motion blur.
- De- and reinterlace, 3:2 pull-down removal/addition, reverse dominance, and broadcast-safe.
- Save effect operator presets to create a library and share effects.
- Compatible with most Adobe® Photoshop® and Adobe After Effects® plug-ins.

Keyframe and Timeline Controls
- New • Customizable channel filtering in the timeline.
- Layer-based timeline and animation curve editor.
- Markers provide ability to add notes and visual cues to your timeline.
- Clip trimming, advanced keyframe, and object control.
- Perform copy/paste and math operations on channels or groups of keyframes.
- Automatic ease in/out control over single or multiple keyframes.
- Define curve interpolation, per keyframe, and define extrapolation per channel.

Image courtesy of Red Rover Animation, Saatchi & Saatchi

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Schematic View
- Interactive representation of the entire process/workflow used to create a composite.
- Work simultaneously within the schematic, timeline, or workspace view.
- Flowchart is automatically constructed as you build a composition.
- Add, delete, move, cut/copy/paste, or add operators.
- Fast navigation with pan, zoom, and center functions.

Architecture
- Resolution-independent—work in any format, including video, HDTV, and feature film.
- 8-, 10-, 12-, 16-, and 32-bit (float) per component image processing and file I/O.
- Convert or mix and match different image resolutions and color bit-depths at any time.
- State-of-the-art RAM caching and real-time RAM playback for increased interactivity.
- Multithreaded UI allows you to continue working while effects render in the background.
- OpenGL acceleration for real-time interactive 3D display and accelerated 2D particles.

Interoperability
- **New** • Import 3ds Max target cameras as .ASE files.
- Exchange garbage mask, keyer, color corrector, and tracker data setups as well as film tools (grain and color LUTs) with Discreet® Inferno®, Discreet® Flame, Discreet® Flint®, Discreet® Fire® and Discreet® Smoke®.
- Exchange tracker data setups with Discreet® Lustre®.
- Import RPF/RLA (rich pixel format) rendered files from 3ds Max complete with extended channel information for post-processing.
- Create image selections based on RPF object and material IDs created in 3ds Max.
- Use RPF/RLA camera information from 3ds Max to control Combustion camera position and orientation.
- Relight rendered RPF/RLA images in Combustion using 3D shading.
- Load Combustion workspace directly into 3ds Max as resolution-independent, scalable texture maps.
- Paint textures in 3ds Max viewports directly with Combustion.

Input /Output
- **New** • Import Windows Media Video 9 and 10 files.
- DV capture and output through OHCI Firewire.
- Capture frames or sequences directly with select QuickTime® compatible capture devices (including 10-bit QuickTime).
- Supports most popular file formats: QuickTime, AVI, BMP, JPG, TGA, ElectricImage™, GIF, JPEG, Photoshop, EPS, PICT, PNG, Quantel™, SGI, TARGA, TIFF, Maya, OpenEXR, RLA, and RPF.
- Support for DPX and 10-bit Cineon file formats and 10- to 8-/16-bit log-linear conversion.
- Supports field rendering and 3:2 pull-down interpolation with automatic detection of phase.
- NTSC and PAL broadcast monitor display is supported with select video cards.
- Import multilayered Adobe® Photoshop® CS PSD files as individual layers for compositing and animation.
- Import and edit Adobe Illustrator® files,[2] including gradients, layers, sequences, as resolution-independent vector-based graphics.

Rendering
- **New** • Command line rendering to quickly launch rendering tasks outside Combustion.
- Autodesk® Render Queue™ operates standalone on multisystems for (background) network rendering.
- Supports multiple outputs per render node—sends email notification upon render completion of Autodesk® Backburner™ network rendering.
- Includes Backburner free of charge, a unified network rendering system.
- Control rendering from within Combustion or the standalone Backburner monitor.

Combustion for Microsoft Windows
The definitive creative solution for desktop compositing and visual effects.

Minimum System Requirements:
- Intel® Pentium® III, Pentium 4, or AMD® Athlon™ XP CPU (850 MHz or higher)
- Windows® XP or Windows 2000
- 20 GB main hard drive with ~ 142 MB free space (100 MB for the software, 42 MB for help)
- 512 MB of RAM
- Video display card with 32 MB of VRAM (1024x768 display with 24-bit color)
- Microsoft Windows Media Player or Apple® QuickTime support
- Macromedia® Flash Player
- Microsoft DirectX®

QuickTime