

# combustion<sup>®</sup> 4

## discreet<sup>®</sup> for Microsoft<sup>®</sup> Windows<sup>®</sup>

The definitive creative solution for desktop paint, compositing and visual effects.

**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, non-destructive workflow and extensive toolset, **combustion 4** delivers incredible power at a “must-have” price and instantly augments the creative potential of any serious desktop video artist.



Image courtesy Martin Square Productions, Cobalt VFX

### Key New Version 4 Features

- Diamond Keyer - high-precision keying technology inherited from Discreet's Academy Award<sup>®</sup> winning **flame<sup>®</sup>** visual effects system<sup>1</sup>
- Timewarp - fully key-frameable, 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 - 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 - 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 & 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 **3ds max<sup>®</sup>**
- Import Windows Media Video 9 and 10 files
- Export OpenEXR files sequences



Image courtesy of Budget Monks Productions / Broken Saints



image courtesy of Red Rover Animation , Saatchi & Saatchi

<sup>1</sup> In 1999, Discreet's **flame** visual effects system was recognized with an Academy Award - Scientific and Engineering Award by the Academy of Motion Picture Arts and Sciences.

## 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, colour correction, tracking, grain management, and masking tools inherited from Discreet's Academy Award®-winning **flame** visual effects system<sup>1</sup>
- 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 visualisation and organisation of complex effects
- OpenGL acceleration, multi-processor 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 colour 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

- Control point grouping to facilitate roto work and shape animation
- Blend colours in the colour mixer using an image as a source
- Corner Radius specifies corner curvature when creating rectangles
- 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)

- Current and total duration displayed in the timeline segment
- 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, non-destructive text animation
- Direct WYSIWYG manipulation of text within the context of the overall composite
- Font attributes (face, outline, shadow) have individual colour, 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 on-screen 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
- Motion track emitters to lock particle effects to moving objects in an image sequence
- Control the colour, emission and behaviour 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

<sup>1</sup> In 1999, Discreet's **flame** visual effects system was recognized with an Academy Award - Scientific and Engineering Award by the Academy of Motion Picture Arts and Sciences.

## 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 behaviour 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 colour-based extraction and rotoscoping
- Edge gradient, Discreet's 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. Advanced Discreet proprietary keying algorithm for pulling precise keys fast.

- High-quality, professional blue/green screen keying with advanced matte control tools
- Intuitive Discreet 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 colour suppression controls

## Colour correction

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

## Motion tracking

- Discreet's 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 keyframeable 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 - optimized, high-quality blur filter with constant-speed rendering independent of blur radius

- GBuffer Builder - 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 re-interlace, 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** - Customisable 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

## 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 centre 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 colour bit-depths at any time
- State-of-the-art RAM caching and real-time RAM playback for increased interactivity
- Multi-threaded UI allows you to continue working while effects render in the background
- OpenGL acceleration for real-time interactive 3D display and accelerated 2D particles

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### Interoperability with other Discreet products

**New** - Import **3ds max** target cameras as .ASE files

- Exchange garbage mask, keyer, colour corrector and tracker data setups as well as film tools (grain and colour LUTs) with **inferno<sup>®</sup>**, **flame<sup>®</sup>**, **flint<sup>®</sup>**, **fire<sup>®</sup>** and **smoke<sup>®</sup>**
- Exchange tracker data setups with **lustre<sup>®</sup>**
- 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<sup>™</sup>, GIF, JPEG, Photoshop, EPS, PICT, PNG, Quantel<sup>™</sup>, 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 multi-layered Adobe<sup>®</sup> Photoshop<sup>®</sup> CS PSD files as individual layers for compositing and animation
- Import and edit Adobe Illustrator<sup>®</sup> files<sup>2</sup>, including gradients, layers, sequences, as resolution-independent vector-based graphics

### Rendering

**New** - Command line rendering to quickly launch rendering tasks outside **combustion**

- Render Queue<sup>™</sup> operates standalone on multi-systems for (background) network rendering
- Supports multiple outputs per render node - sends e-mail notification upon render completion **backburner<sup>™</sup>** network rendering
- Includes **backburner** free of charge, Discreet's unified network rendering system
- Control rendering from within **combustion** or the standalone **backburner** monitor

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The definitive creative solution for desktop compositing and visual effects.

#### Minimum Systems Requirements:

- Intel<sup>®</sup> Pentium<sup>®</sup> III, Pentium 4 or AMD<sup>®</sup> Athlon<sup>™</sup> XP CPU (850 MHz or higher)
- Windows<sup>®</sup> 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<sup>®</sup> Player or Apple<sup>®</sup> QuickTime<sup>®</sup> support
- Macromedia<sup>®</sup> Flash Player
- Microsoft DirectX<sup>®</sup>



To purchase or obtain additional product information on **combustion 4**, contact Discreet:

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<sup>2</sup> Adobe Illustrator version 10 files