LightWave 3D

S E V E N

ANIMATION TOOLS

General Controls

- Squash and stretch tool ☆
- Motify: Replacement Delete key option. It includes more advanced features, including clearing motions, deleting ranges of keys and deleting keys within a threshold ☆
- Hybrid Inverse/Forward Kinematics engine improving on the industry's most flexible IK system available today
- Free-form and locked IK goals
- Separate animated channels

Motion Mixer

- Non-linear animation system for blending any curve track inside of LightWave 3D; Perfect for blending motions, endomorphs or any animatable parameter in LightWave ☆
- Load and save Hierarchical Motion (HMOT) data containing all relevant components, motions and channels for a character group ☆
- Position and scale motions and groups of channels in track view ☆
- Quickly blend multiple motion tracks together with user definable curve ☆
- Set Pre and Post behaviors for HMOT behaviors
- Channel editor allows the user enable/disable independent items or channels from each HMOT behavior ☆
- Absolute and Relative Offset motions settings ☆
- Animation baking for full scene or defined range ☆
- Select by Descendants, Hierarchy, Actor or Motion ☆

SpreadSheet Editor/ Dope Sheet

- Allows mass scene changes to be made quickly. Perfect for complex scene management as well as providing a track view time line for dope sheet style timing adjustments ☆
- Edit sections include: ☆
  - ▼ Bone Properties: Influence and Effect
  - ▼ Light Properties: Basic, Flags, Type Specific, and Shadows
  - ▼ Object Properties: Geometry, Morphing, Displacement, Render Options, Render Flags, Edges
  - ▼ Motions Options: IK, Controllers and Limits HPB
  - ▼ Item Flags
  - ▼ Tem Names and Statistics
  - ▼ Tags
  - ▼ Channel Values
- Customizable workspace for selection of editable values and viewable fields ☆
- Multiple list sorting options ☆
- Multiple workspace configurations ☆
- Dope sheet control over time line for multiple track editing ☆
- Define range of frames for Dope sheet editing ☆
- Item List filtering ☆

Graph Editor (function curve editor)

- Completely new Channel Editing System ☆
- OpenGL interface allows editing hundreds of curves and thousands of key frames in real time. ☆
- New features for handling data rich curves such as Match Footprint Time Slice, Key Reduction, Curve Filtering and Key Bins ☆
- Multiple curve types (Linear, Bezier, Stepped, Hermite Spline, TCB) allows for multi-select and editing of heterogeneous curve types – includes key roll option, interactive key copy, and much more
- Track Layout's selection option, automatically updates current selection of editable curves to match selected item ☆
- Curve View allows collapsible curve list and options sections to provide optimized space for curve editing ☆
- New Lock Motion Keys in Time provides quick method for locking channels for '5.6 style' curve editing ☆
- Customizable key editing behaviors and interface ☆
- Production designed behaviors and options ☆
- Interactive spline tangent (t,c,b) adjustment ☆

Motion and Displacement Controllers

- Modified bones deformation algorithm reduces cross talk between bones and provides a more natural deformation of skin surfaces without any point assignment required ☆
- Spline-based motion and deformation ☆
- New bones system with support for direct vertex assignment and soft influence as defined by user-created weight maps

- Facial animation tool with Endomorphs and Motion Mixer. Users can embed morph positions into the model file and blend between them in a non-linear fashion
- Follower channel modifier to link any items channel to another
- Oscillator channel modifier allows sinusoidal motions to be automatically generated with control of phase, time offset and damping
- Texture motion provides a method for adding a texture to a motion path
- Displacement of geometry along normals, in 3D space or along a specific axis – multiple layers allow combinations
- Integrated Sub-division Bump Displacement creates an accurate displacement of vertices on the surface at the time of subdivision creating very natural, high definition geometric bumping ☆
- P.A.V.L.O.V. (Parameterized Animated Values Linking Objects and Variables)
- Integrated expressions engine and channel repository allowing all animated items in a scene to be referenced, link, or drive one another; also allows surfaces to be modified based on various input parameters or even linked to motions or any other envelope in the scene

Particle FX and Dynamics Systems

- Soft body dynamics for cloth, hair and other simulations
- Preset cloth settings for quick application of various "materials" such as rubber, silk, cotton, etc
- Integrated particle system for explosions, fire and smoke, using wind, gravity and collision effectors
- Simple fluid dynamics and crowd simulation with new interparticle collision calculations ☆
- Particle spawning from parent emitters allows a single particle to become a complex emitter ☆
- Collision spawning allows collision events to create new particles with independent attributes ☆
- Effects grouping allows users to isolate particular wind, gravity, collisions and emitters to affect or disregard each other
- Change Group mode for collisions will force particles into a new Effects Group after collision ☆
- Nozzle types (cone, surface, line) ☆
- Texturing of wind power, particle velocity and wind direction
- Particles are generated with such properties as size, weight, resistance, lifetime, vibration and adherence to the motion of the parent item
- Wind types include: direction, explosion, rotation, cylinder-explosion, doughnut, turbulence, vortex, path, sticky, random, hemisphere and drag ☆

- Collision detection with primitives or polygonal and subdivision surface LightWave objects
- Object and scene linking to particles – attach items or complete hierarchies to particles. Perfect for flocking and swarming actions ☆
- Textured and enveloped birth rate for particles, with emission from pre-defined shapes, object vertices, normals and textures

RENDERING

- Hair and fur rendering using Sasquatch rendering engine, also excellent for grass and foliage. The Sasquatch engine is the fastest, highest quality hair renderer in the industry ☆
- SkyTracer 2.0: Includes completely new, streamlined user interface. Incorporates VIPER and Preset shelf. Utilizes "SunSpot" control allowing users to enter specific time, date and global position to get universally accurate sun positions ☆
- Digital Confusion: New Depth of Field filter that quickly and accurately adds depth of field effects to rendered imagery. Special features include, rendering of hidden geometry for accurate background blurring and optional iris shapes for matching various camera styles ☆
- GL previews of sprites provide users a real time preview of complex sprite based HyperVoxels. Choose between procedural textures or image maps. Useful for smoke, fire or creation of forests and other instance style scenarios ☆
- HyperVoxel texture effects modes for "Dissolve and Expand" and "Velocity Translate" simplifies creation of realistic smoke and fire ☆
- Sprite mode for volumetric lights reduces render times up to 500% ☆
- Soft reflection ☆
- Soft refraction ☆
- BESM (Big Eyes Small Mouth) shader for cartoon style rendering. (As seen on Nickelodeon's Invader Zim!) ☆
- Gmill ray accumulation shader approximates radiosity effects on a selected surface ☆
- Voxel Baking for Volume type HyperVoxels. Users can now bake volumetric clouds for incredibly fast rendering and real time OpenGL previews ☆

- Baking of color, illumination, shaders, radiosity, caustics and diffusion into UV-defined image maps or point maps
- Over 320 bit IEEE floating point rendering pipeline– the expandable pipeline accommodates a growing list of optional buffers, such as reflection, x and y motion, geometry, shading and depth
- Radiosity – calculation of bounced lighting for global illumination with production speed. NEW Backdrop only method for fast global illumination style renders ☆
- Caustics – fast and accurate light reflection and refraction
- High Dynamic Range Imagery for producing accurate lighting models using images as light sources
- The industry's first Flexible Precision Image format
- Improved anti-aliasing
- Integrated volumetrics with HyperVoxels technology
- Subdivision surface rendering
- LightWave Virtual Darkroom technology to simulate film and print exposures
- Shading noise reduction improves shadow quality with lower render times ☆
- Rendering up to 16,000 x 16,000 pixels
- 3 motion blur types: time stepped, vector based and hybrid
- 22 image / animation formats, including QuickTime
- QuickTime VR and VRML output
- True volumetric pixels for creation of fire, smoke, water and other organic effects
- Direct integration of HyperVoxels with particle system
- New render options panel
- Distant, area, linear, spot and point lights
- Comprehensive lens flare system
- 3D textured, animated volumetric lights
- Option to ray trace non-refractive transparency ☆
- Infinite layers of images, sequences, procedurals, gradients, and video
- Infinite layers of UV maps
- Layers can feed into each other for texture blending and manipulation
- Animatable surface attributes
- Translucency
- Glossiness mapping

- Multiple specular highlights with user definable colors with BRDF
- Surface/object based light exclusion
- Gradient textures allow texture values to be based on distance to objects, slope, bump height, camera/light incidence, and more
- Anisotropic specular reflections
- Unlimited network rendering licenses (per platform)

LAYOUT WORKFLOW
& UI ENHANCEMENTS

- VIPER (Versatile Interactive Preview Renderer) – users can utilize this new preview system to make rapid changes to textures, lights, backdrops, volumetrics and HyperVoxels without performing a complete re-render of the scene; changes to these various parameters will automatically update the preview
- Visual preset manager for storing and retrieving volumetric lights, surfaces and HyperVoxel settings
- Schematic view – node-based viewing and editing of hierarchies and dependencies
- Schematic view tools to allow automatic organization of items and multiple view options ☆
- Favorite sets for camera settings ☆
- Item Active flag in Scene Editor allows items to be quickly deactivated from rendering and other calculations ☆
- Select hierarchy (Layout) ☆
- Turn on/off XYZ, HPB (Layout) ☆
- Non-modal windows
- Visual presets manager for storing and retrieving volumetric lights, surfaces and HyperVoxels settings graphically
- Multiple coordinate systems – World, Parent and Local axis editing, which resolves Gimbal lock and allows for item-relative editing
- OpenGL transparency, lens flares, reflectivity, safe areas, field charts and camera masking
- Targeting indicators in Layout views
- Representation for DOF in Layout views
- Weight shade mode (bone influence in GL?) ☆
- Option to disable deformations. Improves interactive operation speed ☆

☆ Indicates features new to LightWave [7] - Specifications subject to change without notice

- Item on/off mode in scene editor ☆
- Center selected item as a button on viewport pane(s) ☆
- Scene/ Preview frame ranges easily accessible ☆
- Edit frame range easily accessible ☆
- New render progress display ☆
- More detailed memory use stats ☆
- Recently opened files command ☆
- Special top group for menu layouts ☆
- General OpenGL optimizations ☆
- Copy/paste in server panes ☆

MODELING

Modeling Tools:

- Phantom subpatch point selector allows users to click directly on the subpatch curve intersection for editing ☆
- Airbrush between morphs ☆
- Productivity Modeling tools: "Aligner", "Sizer", and "Dangle". These modeling tools are great for modeling to scale as well as relational modeling between multiple objects. These are particularly useful for industrial design application ☆
- Rail Modeling tools allowing interactive scale, rotate and stretch based on new curve tool ☆
- Simultaneous selection of up to four weight maps in the Vertex map window; represented in weight shade view style ☆
- Real time subdivision surface modeling
- Convert between polygons and subdivision surfaces at any time during the modeling and animation process
- Intelligentities with Endomorphs, Skelegons and MultiMeshes
- Endomorphs allow morph data to be stored in the object file so changes can be made to the base model without disturbing targets
- Skelegons – radical new skeletal creation tools, allowing creation and editing of bones within geometry
- MultiMeshes provide a layered object format with unlimited layers
- Atlas mapping – automatically generated UV maps that virtually eliminate texture stretching
- Animatable Metaballs, Metafaces and Metaedges
- Direct control over polys, vertices and patches
- Color data can be painted, assigned or baked into each point of the model file (Vertex Shading)
- Symmetry tool for rapid creation of characters
- Export of wireframes to EPS format ☆

- Export 3DS, DXF, OBJ, VRML
- Import EPS, 3DS, OBJ, DXF, FACT
- Face Collapse command ☆
- Rounded edge box tool ☆
- Snap rotations to 15 degrees from rotate mini-widget ☆
- Color wireframes ☆
- Orthogonal and perspective view modeling ports
- UV mapping controls with infinite layering
- VMAP symmetry editing ☆
- Move/Rotate tool (Rove) ☆
- Flatten layers ☆
- Save layers as object(s) ☆

MODELING WORKFLOW
& UI ENHANCEMENTS

- User customizable interface
- Contextual pop-ups
- Beginner, Intermediate and Expert modes for warnings and system messages ☆
- Non-modal windows
- Switch view modes only, using keys ☆
- Revert Object command ☆
- Alpha value for airbrush ☆
- Intelligent Backdrop Image determination based on surface and textures ☆
- Recently opened files commands ☆
- Better 2D snap ☆
- A new "-p<path>" command line option has been added to allow selecting a different plug-in database file. The path string can be either a directory or a complete filename ☆
- Improved info window ☆
- Point indices in info dialog ☆
- Share rotations in focus ☆
- Apply RGB maps to surface when creating ☆
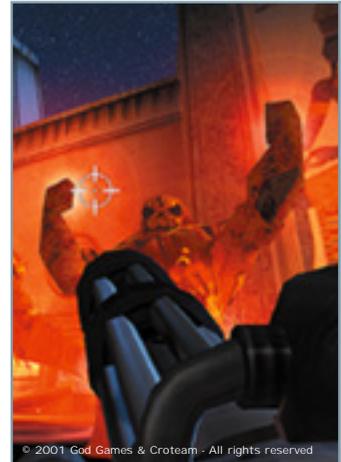
SDK

- LScript - Powerful integrated scripting system
    - ▼ Custom object class ☆
    - ▼ LScript command window ☆
    - ▼ Method for installing scripts as toolbar buttons ☆
- More complete command set and globals ☆
- Load and save commands for servers ☆
- Context menus in panels ☆

Packshot: Andrew Bishop (Darkside Animation).

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