The Unofficial 3DStudio 3DS File Format

v1.0

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Notice

This document is an attempt to document the AutoDesk 3DS file format. This was made difficult in that I don't own or have access to a copy of the program, only to sample files. Fortunately, someone used AutoDesk's own 3DS file development kit to create a program which dumps the contents of a 3DS file into a human readable form - albeit somewhat inaccurately. The codes listed and their names come from that program and have been confirmed by testing.

It should be known that the 3DS format is, as far as I know, a proprietary format of AutoDesk and that the format details are not widely known or are protected by AutoDesk.

It is not my intent to infringe on AutoDesk's rights, but simply to make a large collection of 3D image files accessable to people who do not use 3D Studio - or cannot use it because AutoDesk has not chosen to provide a version of 3D Studio for the computer they use (ie: The Macintosh in my case).

Warning

This document is not intended to be a definitive definition of the 3DS format and is not authorised by AutoDesk. While every effort has been made to ensure its accuracy, or at least warn you when there's doubt about its accuracy, no guarantee of accuracy in any of it can be given. Use this document at your own risk.

Document layout and format information

In the following document, chunk names which are in bold mean the chunk format has been determined with certainty. Chunk names which are not bold but have a struct following means that this is a guess but is not substantiated. All others are unknown.

A **short** is always a two byte integer.
A **long** is always a four byte integer.
A **float** is always a four byte IEEE floating point number.
A **cstr** is a zero byte terminated ASCII string without a length.
A **char** is a single byte integer.

3DS File Format

A 3DS file consists of blocks of data called *chunks*. Every chunk starts the same way:

- short chunk_id;
- long chunk_len;

The *chunk_id* is a unique code which identifies the type of data in this chunk and also may indicate the existence of subordinate chunks. The *chunk_len* indicates the length of following data to be associated with this chunk. Note, this may contain more data than just this chunk. If the length of data is greater than that needed to fill in the information for the chunk, additional subordinate chunks are attached to this chunk immediately following any data needed for this chunk, and should be parsed out. These subordinate chunks may themselves contain subordinate chunks.

Unfortunately, there is no indication of the length of data which is owned by the current chunk, only the total length of data attached to the chunk, which means that the only way to parse out subordinate chunks is to know the exact format of the owning chunk. On the other hand, if a chunk is unknown, the parsing program can skip the entire chunk and subordinate chunks in one jump.

In the following list, I try when possible to indicate that a chunk is likely to have subordinate chunks and what kinds of subordinate chunks I've seen attached to it.

Another problem lies in **cstr** names. I've seen cases where the space used by a name is riddled with fragments of old names. It seems that the space reserved for a name is not cleared if a smaller name replaces it. If the name is removed, you'll get a zero byte indicating an immediate end of string, followed by an undetermined number of characters and nulls. This seems to happen only when the **cstr** is at the end of a block of data and so you can assume that the length of the chunk contains no other subchunks. See **viewport_data** for an example of this.

0xxxH Group

0000H **NULL_CHUNK**

0001H Unknown chunk
float ???

0002H **M3D_VERSION**
short version;

0005H M3D_KFVERSION

0010H **COLOR_F**
float red, grn, blu;

0011H **COLOR_24**
char red, grn, blu;

0012H LIN_COLOR_24
char red, grn, blu;

0013H **LIN_COLOR_F**
float red, grn, blu;

0030H **INT_PERCENTAGE**
short percentage;

0031H **FLOAT_PERCENTAGE**
float percentage;

0100H **MASTER_SCALE**
float scale;

0995H ChunkType

0996H ChunkUnique

0997H NotChunk

0998H Container
0999H IsChunk
0c3cH C_SXP_SELFI_MASKDATA

1xxxH Group

1100H **BIT_MAP**
cstr filename;
1101H **USE_BIT_MAP**
1200H **SOLID_BGND**; followed by color_f
1201H USE_SOLID_BGND
1300H V_GRADIENT; followed by three color_f: start, mid, end
float midpoint;
1301H USE_V_GRADIENT
1400H **LO_SHADOW_BIAS**
float bias;
1410H HI_SHADOW_BIAS
1420H **SHADOW_MAP_SIZE**
short size;
1430H SHADOW_SAMPLES
1440H SHADOW_RANGE
1450H **SHADOW_FILTER**
float filter;
1460H **RAY_BIAS**
float bias;
1500H **O_CONSTS**
float plane_x, plane_y, plane_z;

2xxxH Group

2100H **AMBIENT_LIGHT**
FOG; followed by color_f, fog_bgnd
2200H float near_plane, near_density;
float far_plane, far_density;
2201H USE_FOG
2210H **FOG_BGND**
DISTANCE_CUE followed by dcue_bgnd
2300H float near_plane, near_density;
float far_plane, far_density;
2301H USE_DISTANCE_CUE
LAYER_FOG
2302H float fog_z_from, fog_z_to;
float fog_density;
short fog_type;

2303H USE_LAYER_FOG
2310H **DCUE_BGND**
2d2dH SMAGIC
2d3dH LMAGIC

3xxxH Group

3000H **DEFAULT_VIEW**
VIEW_TOP
3010H float targe_x, target_y, target_z;
float view_width;
VIEW_BOTTOM
3020H float targe_x, target_y, target_z;
float view_width;
VIEW_LEFT
3030H float targe_x, target_y, target_z;
float view_width;
VIEW_RIGHT
3040H float targe_x, target_y, target_z;
float view_width;
VIEW_FRONT
3050H float targe_x, target_y, target_z;
float view_width;
VIEW_BACK
3060H float targe_x, target_y, target_z;
float view_width;
VIEW_USER
3070H float targe_x, target_y, target_z;
float view_width;
3080H VIEW_CAMERA
cstr camera_name;
3090H VIEW_WINDOW
3d3dH **MDATA**; Mesh Data Magic Number (.3DS files sub of 4d4d)
3d3eH MESH_VERSION
3daaH MLIBMAGIC; Material Library Magic Number (.MLI files)
3dc2H PRJMAGIC; 3dS Project Magic Number (.PRJ files)
3dffH MATMAGIC; Material File Magic Number (.MAT files)

4xxxH Group

4000H **NAMED_OBJECT**
cstr name;
4010H OBJ_HIDDEN
4011H OBJ_VIS_LOFTER

4012H OBJ_DOESNT_CAST
4013H OBJ_MATTE
4014H OBJ_FAST
4015H OBJ_PROCEDURAL
4016H OBJ_FROZEN
4017H OBJ_DONT_RCVSHADOW

N_TRI_OBJECT
4100H named triangle object
followed by point_array, point_flag_array, mesh_matrix, face_array

POINT_ARRAY
short npoints;
4110H struct {
float x, y, z;
} points[npoints];

POINT_FLAG_ARRAY
4111H short nflags;
short flags[nflags];

FACE_ARRAY may be followed by smooth_group
short nfaces;
4120H struct {
short vertex1, vertex2, vertex3;
short flags;
} facearray[nfaces];

MSH_MAT_GROUP mesh_material_group
4130H cstr material_name;
short nfaces;
short facenum[nfaces];

4131H OLD_MAT_GROUP

TEX_VERTS
short nverts;
4140H struct {
float x, y;
} vertices[nverts];

SMOOTH_GROUP
4150H short grouplist[n]; determined by length, seems to be 4 per face

MESH_MATRIX
4160H float matrix[4][3];

MESH_COLOR
4165H short color_index;

MESH_TEXTURE_INFO
short map_type;
4170H float x_tiling, y_tiling;
float icon_x, icon_y, icon_z;
float matrix[4][3];
float scaling, plan_icon_w, plan_icon_h, cyl_icon_h;

4181H PROC_NAME

4182H PROC_DATA
4190H MSH_BOXMAP
4400H N_D_L_OLD
4500H N_CAM_OLD
4600H **N_DIRECT_LIGHT**; followed by color_f
float x, y, z;
4610H **DL_SPOTLIGHT**
float target_x, target_y, target_z;
float hotspot_ang;
float falloff_ang;
4620H DL_OFF
4625H DL_ATTENUATE
4627H DL_RAYSHAD
4630H **DL_SHADOWED**
4640H DL_LOCAL_SHADOW
4641H DL_LOCAL_SHADOW2
4650H **DL_SEE_CONE**
4651H DL_SPOT_RECTANGULAR
4652H DL_SPOT_OVERSHOOT
4653H DL_SPOT_PROJECTOR
4654H DL_EXCLUDE
4655H DL_RANGE
4656H **DL_SPOT_ROLL**
float roll_ang;
4657H DL_SPOT_ASPECT
4658H **DL_RAY_BIAS**
float bias;
4659H **DL_INNER_RANGE**
float range;
465aH **DL_OUTER_RANGE**
float range;
465bH **DL_MULTIPLIER**
float multiple;
4680H N_AMBIENT_LIGHT
4700H **N_CAMERA**
float camera_x, camera_y, camera_z;
float target_x, target_y, target_z;
float bank_angle;
float focus;
4710H CAM_SEE_CONE
4720H **CAM_RANGES**
float near_range, far_range;
4d4dH M3DMAGIC; 3DS Magic Number (.3DS file)
4f00H HIERARCHY
4f10H PARENT_OBJECT

4f20H PIVOT_OBJECT
4f30H PIVOT_LIMITS
4f40H PIVOT_ORDER
4f50H XLATE_RANGE

5xxxH Group

5000H POLY_2D
5010H SHAPE_OK
5011H SHAPE_NOT_OK
5020H SHAPE_HOOK

6xxxH Group

6000H PATH_3D
6005H PATH_MATRIX
6010H SHAPE_2D
6020H M_SCALE
6030H M_TWIST
6040H M_TEETER
6050H M_FIT
6060H M_BEVEL
6070H XZ_CURVE
6080H YZ_CURVE
6090H INTERPCT
60a0H DEFORM_LIMIT
6100H USE_CONTOUR
6110H USE_TWEEN
6120H USE_SCALE
6130H USE_TWIST
6140H USE_TEETER
6150H USE_FIT
6160H USE_BEVEL

7xxxH Group

7000H VIEWPORT_LAYOUT_OLD
7001H **VIEWPORT_LAYOUT**; followed by viewport_size, viewport_data
short form, top, ready, wstate, swapws, swapport, swapcur;
7010H VIEWPORT_DATA_OLD
VIEWPORT_DATA

short flags, axis_lockout;
short win_x, win_y, win_w, winh_, win_view;
7011H float zoom;
float worldcenter_x, worldcenter_y, worldcenter_z;
float horiz_ang, vert_ang;
cstr camera_name;

VIEWPORT_DATA_3
short flags, axis_lockout;
short win_x, win_y, win_w, winh_, win_view;
7012H float zoom;
float worldcenter_x, worldcenter_y, worldcenter_z;
float horiz_ang, vert_ang;
cstr camera_name;

7020H **VIEWPORT_SIZE**
short x, y, w, h;

7030H NETWORK_VIEW

8xxxH Group

8000H XDATA_SECTION
8001H XDATA_ENTRY
8002H XDATA_APPNAME
8003H XDATA_STRING
8004H XDATA_FLOAT
8005H XDATA_DOUBLE
8006H XDATA_SHORT
8007H XDATA_LONG
8008H XDATA_VOID
8009H XDATA_GROUP
800aH XDATA_RFU6
800bH XDATA_RFU5
800cH XDATA_RFU4
800dH XDATA_RFU3
800eH XDATA_RFU2
800fH XDATA_RFU1
80f0H PARENT_NAME

AxxxH Group

a000H **MAT_NAME**
cstr material_name;

a010H **MAT_AMBIENT**; followed by color chunk
a020H **MAT_DIFFUSE**; followed by color chunk
a030H **MAT_SPECULAR**; followed by color chunk

a040H **MAT_SHININESS**; followed by percentage chunk
a041H **MAT_SHIN2PCT**; followed by percentage chunk
a042H MAT_SHIN3PCT; followed by percentage chunk
a050H **MAT_TRANSPARENCY**; followed by percentage chunk
a052H **MAT_XPFALL**; followed by percentage chunk
a053H **MAT_REFBLUR**; followed by percentage chunk
a080H MAT_SELF_ILLUM
a081H **MAT_TWO_SIDE**
a082H MAT_DECAL
a083H MAT_ADDITIVE
a084H **MAT_SELF_ILPCT**; followed by percentage chunk
a085H MAT_WIRE
a086H MAT_SUPERSMP
a087H **MAT_WIRESIZE**
float wire_size;
a088H MAT_FACEMAP
a08aH MAT_XPFALLIN
a08cH MAT_PHONGSOFT
a08eH MAT_WIREABS
a100H **MAT_SHADING**
short shading_value;
a200H **MAT_TEXMAP**; followed by percentage chunk, mat_mapname, mat_map_tiling, mat_map_texblur...
a204H MAT_SPECMAP; followed by percentage_chunk, mat_mapname
a210H MAT_OPACMAP; followed by percentage_chunk, mat_mapname
a220H MAT_REFLMAP; followed by percentage_chunk, mat_mapname
a230H **MAT_BUMPMAP**; followed by percentage_chunk, mat_mapname
a240H MAT_USE_XPFALL
a250H **MAT_USE_REFBLUR**
a252H MAT_BUMP_PERCENT
a300H **MAT_MAPNAME**
cstr filename;
a310H MAT_ACUBIC
a320H MAT_SXP_TEXT_DATA
a321H MAT_SXP_TEXT2_DATA
a322H MAT_SXP_OPAC_DATA
a324H MAT_SXP_BUMP_DATA
a325H MAT_SXP_SPEC_DATA
a326H MAT_SXP_SHIN_DATA
a328H MAT_SXP_SELFI_DATA
a32aH MAT_SXP_TEXT_MASKDATA
a32cH MAT_SXP_TEXT2_MASKDATA
a32eH MAT_SXP_OPAC_MASKDATA

a330H MAT_SXP_BUMP_MASKDATA
a332H MAT_SXP_SPEC_MASKDATA
a334H MAT_SXP_SHIN_MASKDATA
a336H MAT_SXP_SELFI_MASKDATA
a338H MAT_SXP_REFL_MASKDATA
a33aH MAT_TEX2MAP
a33cH MAT_SHINMAP
a33dH MAT_SELFIMAP
a33eH MAT_TEXMASK
a340H MAT_TEX2MASK
a342H MAT_OPACMASK
a344H MAT_BUMPMASK
a346H MAT_SHINMASK
a348H MAT_SPECMASK
a34aH MAT_SELFIMASK
a34cH MAT_REFLMASK
a350H MAT_MAP_TILINGOLD
a351H **MAT_MAP_TILING**
short flags;
a352H MAT_MAP_TEXBLUR_OLD
a353H **MAT_MAP_TEXBLUR**
float blurring;
a354H MAT_MAP_USCALE
a356H MAT_MAP_VSCALE
a358H MAT_MAP_UOFFSET
a35aH MAT_MAP_VOFFSET
a35cH MAT_MAP_ANG
a360H MAT_MAP_COL1
a362H MAT_MAP_COL2
a364H MAT_MAP_RCOL
a366H MAT_MAP_GCOL
a368H MAT_MAP_BCOL
afffH MAT_ENTRY

BxxxH Group

b000H **KFDATA**; followed by kfhdr
b001H **AMBIENT_NODE_TAG**
b002H **OBJECT_NODE_TAG**; followed by node_hdr, pivot, pos_track_tag, rot_track_tag, scl_track_tag, morph_smooth...
b003H **CAMERA_NODE_TAG**; followed by node_hdr, pos_track_tag, fov_track_tag, roll_track_tag...
b004H **TARGET_NODE_TAG**; followed by node_hdr, pos_track_tag...

b005H **LIGHT_NODE_TAG**; followed by node_hdr, pos_track_tag, col_track_tag...

b006H **L_TARGET_NODE_TAG**; followed by node_id, node_hdr, pos_track_tag

b007H **SPOTLIGHT_NODE_TAG**; followed by node_id, node_hdr, pos_track_tag, hot_track_tag, fall_track_tag, roll_track_tag, col_track_tag...

b008H **KFSEG**
short start, end;

b009H **KFCURTIME**
short curframe;

KFHDR followed by viewport_layout, kfseg, kfcurtime, object_node_tag, light_node_tag, target_node_tag, camera_node_tag, l_target_node_tag, spotlight_node_tag, ambient_node_tag...
b00aH short revision;
cstr filename;
short animlen;

NODE_HDR
cstr objname;
b010H short flags1;
short flags2;
short heirarchy; ?

b011H INSTANCE_NAME

b012H PRESCALE

b013H **PIVOT**
float pivot_x, pivot_y, pivot_z;

b014H BOUNDBOX

b015H **MORPH_SMOOTH**
float morph_smoothing_angle_rad;

POS_TRACK_TAG
short flags;
short unknown[4];
short keys;
b020H short unknown;
struct {
short framenum;
long unknown;
float pos_x, pos_y, pos_z;
} pos[keys];

ROT_TRACK_TAG
short flags;
short unknown[4];
short keys;
short unknown;
b021H struct {
short framenum;
long unknown;
float rotation_rad;
float axis_x, axis_y, axis_z;
} rot[keys];

SCL_TRACK_TAG
short flags;

short unknown[4];
short keys;
b022H short unknown;
struct {
short framenum;
long unknown;
float scale_x, scale_y, scale_z;
} scale[keys];

FOV_TRACK_TAG
short flags;
short unknown[4];
short keys;
b023H short unknown;
struct {
short framenum;
long unknown;
float camera_field_of_view;
} fov[keys]

ROLL_TRACK_TAG
short flags;
short unknown[4];
short keys;
b024H short unknown;
struct {
short framenum;
long unknown;
float camera_roll;
} roll[keys];

COL_TRACK_TAG
short flags;
short unknown[4];
short keys;
b025H short unknown;
struct {
short framenum;
long unknown;
float red, rgn, blu;
} color[keys];

MORPH_TRACK_TAG
short flags;
short unknown[4];
short keys;
b026H short unknown;
struct {
short framenum;
long unknown;
cstr obj_name;
} morph[keys];

HOT_TRACK_TAG
short flags;

short unknown[4];
short keys;
b027H short unknown;
struct {
short framenum;
long unknown;
float hotspot_ang;
} hotspot[keys];

FALL_TRACK_TAG
short flags;
short unknown[4];
short keys;
b028H short unknown;
struct {
short framenum;
long unknown;
float falloff_ang;
} falloff[keys];

b029H HIDE_TRACK_TAG

b030H **NODE_ID**
short id;

CxxxH Group

c010H C_MDRAWER
c020H C_TDRAWER
c030H C_SHPDRAWER
c040H C_MODDRAWER
c050H C_RIPDRAWER
c060H C_TXDRAWER
c062H C_PDRAWER
c064H C_MTLDRAWER
c066H C_FLIDRAWER
c067H C_CUBDRAWER
c070H C_MFILE
c080H C_SHPFILE
c090H C_MODFILE
c0a0H C_RIPFILE
c0b0H C_TXFILE
c0b2H C_PFILE
c0b4H C_MTLFILE
c0b6H C_FLIFILE
c0b8H C_PALFILE
c0c0H C_TX_STRING
c0d0H C_CONSTS

c0e0H C_SNAPS
c0f0H C_GRIDS
c100H C_ASNAPS
c110H C_GRID_RANGE
c120H C_RENDTYPE
c130H C_PROGMODE
c140H C_PREVMODE
c150H C_MODWMODE
c160H C_MODMODEL
c170H C_ALL_LINES
c180H C_BACK_TYPE
c190H C_MD_CS
c1a0H C_MD_CE
c1b0H C_MD_SML
c1c0H C_MD_SMW
c1c3H C_LOFT_WITH_TEXTURE
c1c4H C_LOFT_L_REPEAT
c1c5H C_LOFT_W_REPEAT
c1c6H C_LOFT_UV_NORMALIZE
c1c7H C_WELD_LOFT
c1d0H C_MD_PDET
c1e0H C_MD_SDET
c1f0H C_RGB_RMODE
c200H C_RGB_HIDE
c202H C_RGB_MAPSW
c204H C_RGB_TWOSIDE
c208H C_RGB_SHADOW
c210H C_RGB_AA
c220H C_RGB_OVW
c230H C_RGB_OVH
c23dH CMAGIC
c240H C_RGB_PICTYPE
c250H C_RGB_OUTPUT
c253H C_RGB_TODISK
c254H C_RGB_COMPRESS
c255H C_JPEG_COMPRESSION
c256H C_RGB_DISPDEV
c259H C_RGB_HARDDEV
c25aH C_RGB_PATH
c25bH C_BITMAP_DRAWER
c260H C_RGB_FILE
c270H C_RGB_OVASPECT

c271H C_RGB_ANIMTYPE
c272H C_RENDER_ALL
c273H C_REND_FROM
c274H C_REND_TO
c275H C_REND_NTH
c276H C_PAL_TYPE
c277H C_RND_TURBO
c278H C_RND_MIP
c279H C_BGND_METHOD
c27aH C_AUTO_REFLECT
c27bH C_VP_FROM
c27cH C_VP_TO
c27dH C_VP_NTH
c27eH C_REND_TSTEP
c27fH C_VP_TSTEP
c280H C_SRDIAM
c290H C_SRDEG
c2a0H C_SRSEG
c2b0H C_SRDIR
c2c0H C_HETOP
c2d0H C_HEBOT
c2e0H C_HEHT
c2f0H C_HETURNS
c300H C_HEDEG
c310H C_HESEG
c320H C_HEDIR
c330H C_QUIKSTUFF
c340H C_SEE_LIGHTS
c350H C_SEE_CAMERAS
c360H C_SEE_3D
c370H C_MESHSEL
c380H C_MESHUNSEL
c390H C_POLYSEL
c3a0H C_POLYUNSEL
c3a2H C_SHPLOCAL
c3a4H C_MSHLOCAL
c3b0H C_NUM_FORMAT
c3c0H C_ARCH_DENOM
c3d0H C_IN_DEVICE
c3e0H C_MSCALE
c3f0H C_COMM_PORT
c400H C_TAB_BASES

c410H C_TAB_DIVS
c420H C_MASTER_SCALES
c430H C_SHOW_1STVERT
c440H C_SHAPER_OK
c450H C_LOFTER_OK
c460H C_EDITOR_OK
c470H C_KEYFRAMER_OK
c480H C_PICKSIZE
c490H C_MAPTYPE
c4a0H C_MAP_DISPLAY
c4b0H C_TILE_XY
c4c0H C_MAP_XYZ
c4d0H C_MAP_SCALE
c4e0H C_MAP_MATRIX_OLD
c4e1H C_MAP_MATRIX
c4f0H C_MAP_WID_HT
c500H C_OBNAME
c510H C_CAMNAME
c520H C_LTNAME
c525H C_CUR_MNAME
c526H C_CURMTL_FROM_MESH
c527H C_GET_SHAPE_MAKE_FACES
c530H C_DETAIL
c540H C_VERTMARK
c550H C_MSHAX
c560H C_MSHCP
c570H C_USERAX
c580H C_SHOOK
c590H C_RAX
c5a0H C_STAPE
c5b0H C_LTAPE
c5c0H C_ETAPE
c5c8H C_KTAPE
c5d0H C_SPHSEGS
c5e0H C_GEOSMOOTH
c5f0H C_HEMISEGS
c600H C_PRISMSEGS
c610H C_PRISMSIDES
c620H C_TUBESEGS
c630H C_TUBESIDES
c640H C_TORSEGS
c650H C_TORSIDES

c660H C_CONESIDES
c661H C_CONESEGS
c670H C_NGPARMS
c680H C_PTHLEVEL
c690H C_MSCSYM
c6a0H C_MFTSYM
c6b0H C_MTTSYM
c6c0H C_SMOOTHING
c6d0H C_MODICOUNT
c6e0H C_FONTSEL
c6f0H C_TESS_TYPE
c6f1H C_TESS_TENSION
c700H C_SEG_START
c705H C_SEG_END
c710H C_CURTIME
c715H C_ANIMLENGTH
c720H C_PV_FROM
c725H C_PV_TO
c730H C_PV_DOFNUM
c735H C_PV_RNG
c740H C_PV_NTH
c745H C_PV_TYPE
c750H C_PV_METHOD
c755H C_PV_FPS
c765H C_VTR_FRAMES
c770H C_VTR_HDTL
c771H C_VTR_HD
c772H C_VTR_TL
c775H C_VTR_IN
c780H C_VTR_PK
c785H C_VTR_SH
c790H C_WORK_MTLS
c792H C_WORK_MTLS_2
c793H C_WORK_MTLS_3
c794H C_WORK_MTLS_4
c7a1H C_BGTYPE
c7b0H C_MEDTILE
c7d0H C_LO_CONTRAST
c7d1H C_HI_CONTRAST
c7e0H C_FROZ_DISPLAY
c7f0H C_BOOLWELD
c7f1H C_BOOLTYPE

c900H C_ANG_THRESH
c901H C_SS_THRESH
c903H C_TEXTURE_BLUR_DEFAULT
ca00H C_MAPDRAWER
ca01H C_MAPDRAWER1
ca02H C_MAPDRAWER2
ca03H C_MAPDRAWER3
ca04H C_MAPDRAWER4
ca05H C_MAPDRAWER5
ca06H C_MAPDRAWER6
ca07H C_MAPDRAWER7
ca08H C_MAPDRAWER8
ca09H C_MAPDRAWER9
ca10H C_MAPDRAWER_ENTRY
ca20H C_BACKUP_FILE
ca21H C_DITHER_256
ca22H C_SAVE_LAST
ca23H C_USE_ALPHA
ca24H C_TGA_DEPTH
ca25H C_REND_FIELDS
ca26H C_REFLIP
ca27H C_SEL_ITEMTOG
ca28H C_SEL_RESET
ca29H C_STICKY_KEYINF
ca2aH C_WELD_THRESHOLD
ca2bH C_ZCLIP_POINT
ca2cH C_ALPHA_SPLIT
ca30H C_KF_SHOW_BACKFACE
ca40H C_OPTIMIZE_LOFT
ca42H C_TENS_DEFAULT
ca44H C_CONT_DEFAULT
ca46H C_BIAS_DEFAULT
ca50H C_DXFNAME_SRC
ca60H C_AUTO_WELD
ca70H C_AUTO_UNIFY
ca80H C_AUTO_SMOOTH
ca90H C_DXF_SMOOTH_ANG
caa0H C_SMOOTH_ANG
cb00H C_WORK_MTLS_5
cb01H C_WORK_MTLS_6
cb02H C_WORK_MTLS_7
cb03H C_WORK_MTLS_8

cb04H C_WORKMTL
cb10H C_SXP_TEXT_DATA
cb11H C_SXP_OPAC_DATA
cb12H C_SXP_BUMP_DATA
cb13H C_SXP_SHIN_DATA
cb20H C_SXP_TEXT2_DATA
cb24H C_SXP_SPEC_DATA
cb28H C_SXP_SELFI_DATA
cb30H C_SXP_TEXT_MASKDATA
cb32H C_SXP_TEXT2_MASKDATA
cb34H C_SXP_OPAC_MASKDATA
cb36H C_SXP_BUMP_MASKDATA
cb38H C_SXP_SPEC_MASKDATA
cb3aH C_SXP_SHIN_MASKDATA
cb3eH C_SXP_REFL_MASKDATA
cc00H C_NET_USE_VPOST
cc10H C_NET_USE_GAMMA
cc20H C_NET_FIELD_ORDER
cd00H C_BLUR_FRAMES
cd10H C_BLUR_SAMPLES
cd20H C_BLUR_DUR
cd30H C_HOT_METHOD
cd40H C_HOT_CHECK
cd50H C_PIXEL_SIZE
cd60H C_DISP_GAMMA
cd70H C_FBUF_GAMMA
cd80H C_FILE_OUT_GAMMA
cd82H C_FILE_IN_GAMMA
cd84H C_GAMMA_CORRECT
cd90H C_APPLY_DISP_GAMMA
cda0H C_APPLY_FBUF_GAMMA
cdb0H C_APPLY_FILE_GAMMA
cdc0H C_FORCE_WIRE
cdd0H C_RAY_SHADOWS
cde0H C_MASTER_AMBIENT
cdf0H C_SUPER_SAMPLE
ce00H C_OBJECT_MBLUR
ce10H C_MBLUR_DITHER
ce20H C_DITHER_24
ce30H C_SUPER_BLACK
ce40H C_SAFE_FRAME
ce50H C_VIEW_PRES_RATIO

ce60H C_BGND_PRES_RATIO
ce70H C_NTH_SERIAL_NUM

DxxxH Group

d000H VPDATA
d100H P_QUEUE_ENTRY
d110H P_QUEUE_IMAGE
d114H P_QUEUE_USEIGAMMA
d120H P_QUEUE_PROC
d130H P_QUEUE_SOLID
d140H P_QUEUE_GRADIENT
d150H P_QUEUE_KF
d152H P_QUEUE_MOTBLUR
d153H P_QUEUE_MB_REPEAT
d160H P_QUEUE_NONE
d180H P_QUEUE_RESIZE
d185H P_QUEUE_OFFSET
d190H P_QUEUE_ALIGN
d1a0H P_CUSTOM_SIZE
d210H P_ALPH_NONE
d220H P_ALPH_PSEUDO
d221H P_ALPH_OP_PSEUDO
d222H P_ALPH_BLUR
d225H P_ALPH_PCOL
d230H P_ALPH_C0
d231H P_ALPH_OP_KEY
d235H P_ALPH_KCOL
d238H P_ALPH_OP_NOCONV
d240H P_ALPH_IMAGE
d250H P_ALPH_ALPHA
d260H P_ALPH_QUES
d265H P_ALPH_QUEIMG
d270H P_ALPH_CUTOFF
d280H P_ALPHANEG
d300H P_TRAN_NONE
d310H P_TRAN_IMAGE
d312H P_TRAN_FRAMES
d320H P_TRAN_FADEIN
d330H P_TRAN_FADEOUT
d340H P_TRANNEG
d400H P_RANGES

d500H P_PROC_DATA

FxxxH Group

f020H POS_TRACK_TAG_KEY
f021H ROT_TRACK_TAG_KEY
f022H SCL_TRACK_TAG_KEY
f023H FOV_TRACK_TAG_KEY
f024H ROLL_TRACK_TAG_KEY
f025H COL_TRACK_TAG_KEY
f026H MORPH_TRACK_TAG_KEY
f027H HOT_TRACK_TAG_KEY
f028H FALL_TRACK_TAG_KEY
f110H POINT_ARRAY_ENTRY
f111H POINT_FLAG_ARRAY_ENTRY
f120H FACE_ARRAY_ENTRY
f130H MSH_MAT_GROUP_ENTRY
f140H TEX_VERTS_ENTRY
f150H SMOOTH_GROUP_ENTRY
ffffH **DUMMY**