

Chapter 10.

File Formats

Topic: Ignore

This chapter briefly describes the formats of various files created or used by ACIS.

SAT Save File

Topic: *SAT Save and Restore

ACIS *saves*, or stores, model geometry information to ACIS *save files* (also known as *part save files* or *part files*). ACIS also *restores* model information from these files. These files have an open format so that external applications, such as those not based on ACIS, can have access to the ACIS geometric model. These applications are then able to read the pure geometric data from or write information to a saved model without negatively impacting the ACIS core routines or other external applications. An example of a non-ACIS based application that needs the geometric model information is a conversion routine from ACIS to another format, or vice versa.

There are two types of ACIS save files: *Standard ACIS Text* (file extension .sat) and *Standard ACIS Binary* (file extension .sab). The only difference between these files is that the data is stored as ASCII text in a .sat file and in binary form in a .sab file. The organization of a .sat file and a .sab file is identical; the term *SAT file* is generally used to refer to both types.

Refer to the *Kernel Component Manual* for a description of the save and restore functionality.

Scheme Journal File

Topic: *Scheme Interface

A Scheme journal file (.jrl) records Scheme commands sent to the Scheme interpreter, and the printed output those commands generated. Scheme journal files have a .jrl file extension.

Recording can be turned on or off, and can be paused then resumed. Output is sent to the file specified by the journal:on or journal:append extensions:

```
(journal:on "new_jrl")
```

For example, the following Scheme commands issued to the Scheme AIDE demonstration application (prompts and application responses are shown):

```
acis> (journal:on "myjournal")
()
acis> (solid:block (position 0 0 0) (position 10 10 10))
#[entity 1 1]
acis> (define b1 (solid:block (position 0 0 0)
                             (position 20 20 20)))
b1
acis> (journal:off)
()
(define b2 (solid:block (position 0 0 0) (position 30 30 30)))
b2
```

will generate this journal file:

```
;;
;; (journal:on "myjournal")
;; ()
(solid:block (position 0 0 0) (position 10 10 10))
;; #[entity 1 1]
(define b1 (solid:block (position 0 0 0) (position 20 20 20)))
;; b1
;; (journal:off)
```

Debug File

Topic: **Debugging*

A debug file (.dbg) contains a breakdown of an entity's topology and geometry in ASCII format, suitable for debugging purposes.

The debug file consists of a series of lists and a summary. Each list shows all the entity's instances of a particular topology or geometry. For more information on each type of geometry and topology, refer to the *3D ACIS Getting Started Guide*.

In the following topology and geometry format examples, only one entry for each type of list is shown. Complex entities may have many entries for each list.

Creating a Debug File

Topic: *Debugging*

A debug file is produced with the following calls:

```
FILE *fp = fopen("block.dbg","w");    // name of output file
debug_entity(b1,fp);                  // entity to be analyzed
fclose(fp);
```

Topology Formats

Topic: [Debugging](#)

This section shows the topology debug formats.

BODY List

Topic: [Debugging](#)

The BODY list shows each topology of the type BODY:

```
===== BODY LIST =====
body 0 35176:
  Rollback pointer    : 16152
  Attribute list      : NULL
  Lump list           : lump 0 33152
  Wire list           : NULL
  Transform            : NULL
  Bounding box        : NULL
```

WIRE List

Topic: [Debugging](#)

The WIRE list shows each topology of the type WIRE:

```
===== WIRE LIST =====
wire 0 87360:
  Rollback pointer    : NULL
  Attribute list      : NULL
  Owning body         : body 0 91416
  Next wire           : NULL
  Start coedge        : coedge 0 85328
  Bounding box        : NULL
```

LUMP List

Topic: [Debugging](#)

The LUMP list shows each topology of the type LUMP:

```
===== LUMP LIST =====
lump 0 33152:
  Rollback pointer    : 16136
  Attribute list      : NULL
  Owning body         : body 0 35176
  Next lump           : NULL
  Shell list          : shell 0 31128
  Bounding box        : NULL
```

SHELL List

Topic: Debugging

The SHELL list shows each topology of the type SHELL:

```
===== SHELL LIST =====
shell 0 31128:
  Rollback pointer      : 16120
  Attribute list        : NULL
  Owning lump           : lump 0 33152
  Next shell            : NULL
  Subshell list         : NULL
  Face list             : face 0 29316
  Bounding box          : NULL
```

FACE List

Topic: Debugging

The FACE list shows each topology of the type FACE:

```
===== FACE LIST =====
face 0 29316:
  Rollback pointer      : 16104
  Attribute list        : NULL
  Owning shell          : shell 0 31128
  Parent subshell       : NULL
  Next face             : face 1 29272
  Loop list             : loop 0 25208
  Surface geometry      : plane 0 27632
  Sense                 : forward
  Bounding box          : NULL
```

LOOP List

Topic: Debugging

The LOOP list shows each topology of the type LOOP:

```
===== LOOP LIST =====
loop 0 25208:
  Rollback pointer      : 16072
  Attribute list        : NULL
  Owning face           : face 0 29316
  Next loop             : NULL
  Start coedge          : coedge 0 23896
  Bounding box          : NULL
```

COEDGE List

Topic: Debugging

The COEDGE list shows each topology of the type COEDGE:

```

===== COEDGE LIST =====
coedge 0 23896:
  Rollback pointer      : 16008
  Attribute list        : NULL
  Owning entity         : loop 0 25208
  Partner               : coedge 6 23148
  Previous coedge       : coedge 7 24028
  Next coedge           : coedge 8 23940
  Edge                  : edge 0 20984
  Sense                 : forward
  Parametric form       : NULL

```

EDGE List

Topic: [Debugging](#)

The EDGE list shows each topology of the type EDGE:

```

===== EDGE LIST =====
edge 0 20984:
  Rollback pointer      : 15080
  Attribute list        : NULL
  Coedge pointer        : coedge 6 23148
  Start vertex          : vertex 0 16848
  Start parameter       : -5
  End vertex            : vertex 1 16896
  End parameter         : 5
  Curve geometry        : straight 0 18952
  Sense                 : forward
  Bounding box          : NULL

```

VERTEX List

Topic: [Debugging](#)

The VERTEX list shows each topology of the type VERTEX:

```

===== VERTEX LIST =====
vertex 0 16848:
  Rollback pointer      : 14824
  Attribute list        : NULL
  Edge pointer          : edge 0 20984
  Point geometry        : point 0 12784

```

Geometry Debug Formats

Topic: [Debugging](#)

This section shows the geometry debug formats.

SURFACE List

Topic: [Debugging](#)

The SURFACE list shows each type: CONE, PLANE, SPHERE, TORUS, and SPLINE:

===== SURFACE LIST =====

cone 0 227456:

Rollback pointer : NULL
Attribute list : NULL
Use count : 1
Surface type : cone
Root point : 0, 0, 0
Direction : 0, 0, 1
Major axis : 25, 0, 0
Radius ratio : 0.4
Angle ratios : 0, 1

plane 0 27632:

Rollback pointer : 16088
Attribute list : NULL
Use count : 1
Surface type : plane
Root point : 0, 0, 5
Normal : 0, 0, 1

sphere 0 125176:

Rollback pointer : NULL
Attribute list : NULL
Use count : 1
Surface type : sphere
Centre : 0, 0, 0
Radius : 10

torus 0 229440:

Rollback pointer : NULL
Attribute list : NULL
Use count : 1
Surface type : torus
Centre : 0, 0, 0
Normal : 0, 0, 1
Major radius : 60
Minor radius : 20

```

spline 0 149888:
  Rollback pointer      : NULL
  Attribute list        : NULL
  Use count             : 1
  Surface type          : splined surface:
                        : exact spline
                        : 3D B-spline surface
                        :   open in u direction, degree 3, 5 control points
                        :   open in v direction, degree 3, 5 control points
                        :   u = 0
                        :   (-50, -50, 25), 0
                        :   (-50, -38.214886980224, 36.785113019776), 50
                        :   (-50, 0, 13.214886980224), 100
                        :   (-50, 38.214886980224, 36.785113019776), 100
                        :   (-50, 50, 25), 100
                        :   u = 50
                        :   (-38.214886980224, -50, 36.785113019776), 0
                        :   (-38.214886980224, -38.214886980224,
                        :       44.64185503296), 50
                        :   (-38.214886980224, 0, 15.17907248352), 100
                        :   (-38.214886980224, 38.214886980224, 25), 100
                        :   (-38.214886980224, 50, 13.214886980224), 100
                        :   u = 100
                        :   (0, -50, 25), 0
                        :   (0, -38.214886980224, 38.749298523072), 50
                        :   (0, 0, 25), 100
                        :   (0, 38.214886980224, 34.82092751648), 100
                        :   (0, 50, 36.785113019776), 100
                        :   u = 100
                        :   (38.214886980224, -50, 13.214886980224), 0
                        :   (38.214886980224, -38.214886980224, 25), 50
                        :   (38.214886980224, 0, 11.250701476928), 100
                        :   (38.214886980224, 38.214886980224,
                        :       5.3581449670403), 100
                        :   (38.214886980224, 50, 13.214886980224), 100
                        :   u = 100
                        :   (50, -50, 25), 0
                        :   (50, -38.214886980224, 36.785113019776), 50
                        :   (50, 0, 25), 100
                        :   (50, 38.214886980224, 13.214886980224), 100
                        :   (50, 50, 25), 100
                        :   fit tolerance 0

```

CURVE List

Topic: Debugging

The CURVE list shows each geometry of the types: STRAIGHT, ELLIPSE, and INTCURVE:

```

===== CURVE LIST =====
straight 0 18952:
  Rollback pointer      : 15064
  Attribute list        : NULL
  Use count             : 1
  Curve type            : straight
  Root point            : 5, 0, 5
  Direction              : 0, 1, 0

ellipse 0 127224:
  Rollback pointer      : NULL
  Attribute list        : NULL
  Use count             : 1
  Curve type            : ellipse
  Centre                : 0, 0, 0
  Normal                 : -1, 0, 0
  Major axis             : 0, 100, 0
  Ratio of axes          : 0.5

intcurve 0 151912:
  Rollback pointer      : NULL
  Attribute list        : NULL
  Use count             : 2
  Curve type            : interpolated curve:
                        : exact spline
                        : open B-spline of degree 3
                        :   5 control points:
                        :     (50, -50, 25), 0
                        :     (50, -38.214886980224, 36.785113019776), 50
                        :     (50, 0, 25), 100
                        :     (50, 38.214886980224, 13.214886980224), 100
                        :     (50, 50, 25), 100
                        : fit tolerance 0
                        : surfaces:
                        :   exact sur-spline
                        : and
                        :   plane
                        : pcurve1 121704
                        :   pcurve2 NULL

```

PCURVE List

Topic: [Debugging](#)

The PCURVE list shows each parameter space geometry of the type PCURVE:


```

===== PCURVE LIST =====
pcurve 2 154800:
  Rollback pointer      : NULL
  Attribute list       : NULL
  Use count            : 1
  Privately owned      : parameter-space curve:
                       : explicit
                       : open B-spline of degree 1 (straight)
                       :   2 control points:
                       :     (1.00000000003174e-05, 11.785123019776), -25
                       :     (1.00000000003174e-05, 61.785123019776), 25
                       : fit tolerance 0
                       : surface:
                       :   exact sur-spline
                       :   offset by (0, 0)

```

POINT List

Topic: Debugging

The point list shows each geometry of type POINT:

```

===== POINT LIST =====
point 0 12784:
  Rollback pointer      : 14808
  Attribute list       : NULL
  Use count            : 1
  Coordinates          : 5, -5, 5

```

Summary of Lists

Topic: Debugging

Shows the number of each type of topology and geometry, and the memory occupied:

1 body record,	32 bytes
1 lump record,	32 bytes
1 shell record,	36 bytes
6 face records,	164 bytes
6 loop records,	192 bytes
6 surface records,	672 bytes
24 coedge records,	1056 bytes
12 edge records,	528 bytes
8 vertex records,	192 bytes
12 curve records,	1056 bytes
8 point records,	384 bytes
Total storage 4444 bytes	