SPANS VEH/VEC/TBA Reader/Writer

FORMAT NOTES:

The SPANS modules must be purchased from Tydac AG in Switzerland:
TYDAC AG
Luternauweg 12 – 3006 Bern, Switzerland
Telephone: +41 31 368 0180 **Fax:** +41 31 368 1860
E-mail: info@tydac.ch
Web: http://www.tydac.ch

The SPANS Data Interchange Format (VEH/VEC/TBA[1]) Reader and Writer modules provide the Feature Manipulation Engine (FME) with the ability to read and write SPANS Archive files. The SPANS Archive format is a published ASCII format used by the SPANS product for input and export. The *SPANS Technical Reference Manual* describes the format.

SPANS Interchange Format files are often called VEC files.

Overview

SPANS is a two-dimensional (2D) system with no provision for transferring elevation data for each vertex in a SPANS feature. However, features can define an elevation attribute or class to store their elevation.

SPANS files store both feature geometry and attributes. A logical SPANS file consists of three physical files, having the following file name extensions:

File Name Extension	Contents
`.veh`	Vector header
`.vec`	Vector geometric data
`.tba`	Attributes for the geometric data

These extensions are added to the base name of the SPANS file.

The SPANS reader and writer support the storage of point, polyline, and polygon in SPANS files. The SPANS format also stores features with no geometry. Features having no geometry are referred to as having a geometry of *none*.

Note: Polygon files, called `AREAS` in SPANS, have to be exported from SPANS using the **spans** or the **whole polygon** option. **Only SPANS written using SPANS 7 or later are supported**. That is, do ***not*** use the SPANS Vector Translator or SPANS version 5.x to generate SPANS files to be translated using FME.

1. VEH/VEC/TBA are the SPANS ASCII FILE extensions. VEH stands for vector header file; VEC means vector data file; TBA stands for attribute table file.

SPANS Data Interchange Format Quick Facts

Format Type Identifier	SPANS
Reader/Writer	Both
Licensing Level	Base
Dependencies	Extra-cost plug-in required
Dataset Type	• File for Reader • Directory for Writer
Feature Type	File base name
Typical File Extensions	.veh, .tba (.vec)
Automated Translation Support	Yes
User-Defined Attributes	Yes
Coordinate System Support	No
Generic Color Support	Yes
Spatial Index	Never
Schema Required	Yes
Transaction Support	No
Geometry Type	spans_type

Geometry Support			
Geometry	**Supported?**	**Geometry**	**Supported?**
aggregate	no	point	yes
circles	no	polygon	yes
circular arc	no	raster	no
donut polygon	yes	solid	no
elliptical arc	no	surface	no
ellipses	no	text	no
line	yes	z values	no
none	yes		

Reader Overview

The SPANS reader reads the specified SPANS file. Then it extracts features from the file one at a time, and passes them on to the rest of the FME for further processing.

In the next release, a Multi-Reader version will be available, which means all SPANS files in a specified directory will be read and translated.

Reader Directives

The following table lists the keywords processed by the SPANS reader. The table shows only the suffixes prefixed by the current `<ReaderKeyword>` in a mapping file. By default, the `<ReaderKeyword>` for the SPANS reader is `SPANS`.

DATASET

Required/Optional: *Required*

The value for this keyword is the directory containing the SPANS files to be read. A typical mapping file fragment specifying an input SPANS dataset looks like:

```
SPANS_DATASET d:\spans\data\test.veh
```

DEF

Required/Optional: *Required*

A SPANS file must be defined before it can be read. The definition specifies the base name of the file, and the names and the types of all attributes. The syntax of a SPANS `DEF` line is:

```
<ReaderKeyword>_DEF <baseName>                                    \
  [<attrName> <attrType>]+
```

The file names of the physical SPANS files are constructed by using the base file name specified by the `DATASET` keyword, the base name specified on the SPANS `DEF` lines, and the `.veh` (header), `.vec` (geometry), and `.tba` (attributes) extensions.

A `.tba` attribute file is optional. If no attribute file is found, the SPANS attributes—as defined in the `.vec` file—are written to the destination file (entity, class, and priority).

The following table shows the attribute types supported.

Field Type	Description
`char(<width>)`	Character fields store fixed-length strings. The `width` parameter controls the maximum number of characters that can be stored by the field and corresponds to the SPANS character string (20+).
`date`	Date fields store dates as character strings with the format YYYYMMDD and are written as a SPANS character string (20+).
`number(<width>,<decimals>)`	Decimal fields store single and double precision floating point values. The `width` parameter is the total number of characters allocated to the field, including the decimal point. The `decimals` parameter controls the precision of the data and is the number of digits to the right of the decimal. This parameter corresponds to SPANS type `1` (double).
`integer`	Integer fields store 32 bit signed integers and correspond to SPANS type `3` (long integer).
`logical`	Logical fields store `TRUE` or `FALSE` data. Data read or written from and to such fields must always have a value of either true or false. It is written to SPANS type `3`.

The following mapping file fragment defines a SPANS file. Notice that the definition specifies the geometric type of the entities it will contain because SPANS files may contain any of the valid geometry types.

```
SPANS_DEF agglo_90_region                                    \
  SPANS_GEOMETRY       spans_polygon                         \
  agg90nr              number(11,0)                          \
  name                 char(27)                              \
  poptot               number(11,0)                          \
  popmtot              number(11,0)
```

Writer Overview

The SPANS writer creates and writes feature data to SPANS files in the directory specified by the DATASET keyword. The directory must exist before the translation occurs. If there are any old SPANS files in the directory, they will be overwritten with new feature data. As features are routed to the SPANS writer, it determines the file into which the features are written and outputs them accordingly. Many SPANS files can be written during a single FME session.

Writer Directives

The SPANS writer processes the DATASET and DEF keywords as described under the heading *Reader Directives*. It does not make use of the IDs keyword. It does, however, make use of an additional keyword, COORDSYS_STATEMENT, that can be used to force the coordinate system statement that is output.

Projection

Projections are currently handled by writing a coordinate system string to the .veh so that the projection can be chosen interactively when importing the file into SPANS.

Feature Representation

SPANS features consist of geometry and attributes. The attribute names are defined on the DEF line and there is a value for each attribute in each SPANS feature. In addition to the generic FME feature attributes that FME Workbench adds to all features (see *About Feature Attributes* on page 7), each SPANS feature contains several special attributes to hold the type of geometric entity and its display parameters. All SPANS features contain a spans_type attribute that identifies the geometric type. Depending on

the geometric type, the feature contains additional attributes specific to the geometric type. These are described in subsequent sections.

Attribute Name	Contents
spans_type	The SPANS geometric type of this entity. **Range:** spans_point| spans_arc| spans_area| spans_none **Default:** No default

Points

spans_type: spans_point

SPANS point features specify a single x and y coordinate in addition to any associated user-defined attributes. A SPANS point also specifies a label. The symbol is defined by the text for the label, the rotation, and the height.

The table below lists the special FME attribute names used to control the SPANS label settings.

Attribute Name	Contents
SPANS_label	The text for the label. **Range:** 0…254
SPANS_angle	The text rotation angle. **Range:** 0...360
SPANS_height	The height of the text. **Range:** Any integer number > 0

Arcs

spans_type: spans_arc

SPANS arc features specify linear features defined by a sequence of x and y coordinates (a polyline).

Regions

spans_type: spans_area

SPANS area features specify area (polygonal) features.

SPANS areas are read in the **spans** or **whole polygon** format, and are written in the **whole polygon** format.

Importing Data into SPANS

The FME writes a column called ent in the TBA file. The ent column is used to append the attributes after importing arcs or areas into SPANS. Use the function Edit/Append

attributes to accomplish this. The column `ent` corresponds to the column `src_id` in the layer.