IVAO

INTERNATIONAL VIRTUAL AVIATION ORGANISATION

IVAO - ATC CLIENT

SECTOR FILE FORMAT

CHANGE LOG

Date	Version	Author	Description
23/09/2019	1.0	193103 - Christopher Gyllen	Document initial version.
10/10/2019	1.1	193103 - Christopher Gyllen	Fields updated, general revision.

General information

Coordinates Format

You can use the following formats:

- DMS, MAX 14 characters, pad with zeros. LAT & LON separated by semicolon (;), and finishing the row with semicolon (;). IE: N038.10.04.627;E024.33.34.904;

- DMS without separation, MAX 11 characters. LAT & LON separated by semicolon (;), and finishing the row with semicolon (;). IE: N0381004627;E0243334904;

- Decimal, MAX 13 characters. North and East are positive but South and West are negative and require a minus (-) to prefix the coordinate. LAT & LON separated by semicolon (;), and finishing the row with semicolon (;). IE: 38.02235785;24.12223578;

- Referenced point, you can use a FIX, VOR or NDB ID as reference for LAT/LON, separated by semicolon (;), and finishing the row with semicolon (;). IE: NAME;NAME;

In addition to the above mentioned, you can also use a mix of the different formats:

- A mix of DMS and Decimal, in one line, IS NOT ALLOWED, and will return an error.

  N038.10.04.627;24.12223578;

  38.02235785;E024.33.34.904;

- A mix between DMS and Reference (ID), IS ALLOWED.

  N038.10.04.627;AMB;

  AMB;E024.33.34.904;

- A mix between Decimal and Reference (ID), IS ALLOWED.

  38.02235785;AMB;

  AMB;24.12223578;

COLORS

You can use the following formats:

1) Hexadecimal: #00RRGGBB or $00RRGGBB or #RRGGBB or $RRGGBB

2) Decimal: %rrr:ggg:bbb

SEPARATED FILES

To ensure a better compiled sectorfile, you can use separated files (recommended). These files must be located in the "include" folder, which is inside the main "SectorFiles" folder. This "include" folder, is defined in LINE 6 of [INFO] section, described later in this document.

The following Filenames and Extensions are "automatically" loaded:

- ICAO.gts – Gates or Parking Stands
- ICAO.txi – Taxi Labels
- ICAO.sid – SID's
- ICAO.str – STAR's
- ICAO.vfi – VFR Fixes
- ICAO.vrt – VFR Routes
- ICAO.mva – MRVA Areas
- ICAO.tfl – Polyline
- ICAO.geo – Geo

Files are included in the sector file using the F; command, for example:

[ARTCC]
F;ICAO.xxx
F;ICAO.yyy

IMPORTANT: No other characters or spaces after declare a file. Do not add a semicolon (;) to finish row.

ALLOWED LINES

Only empty rows, or rows starting with two (2) slash (//) will be allowed.

All other lines longer than two (2) characters will return an error.

For example, for comments, you can use // as it will not be "processed" by the Client.

SECTION FORMAT

BASIC INFORMATION - [INFO]

- Line 1: REQUIRED - Center point Latitude.
- Line 2: REQUIRED - Center point Longitude.
- Line 3: REQUIRED - Vertical RATIO (latitude).
- Line 4: REQUIRED - Horizontal RATIO (longitude).
- Line 5: REQUIRED - Magnetic Variation (magvar). East Positive (no sign), West Negative (add -).
- Line 6: OPTIONAL – Include folder name (SectorFiles/Include/XXXX).

Note: No semicolon (;) added to end lines.

```
// - BASIC INFORMATION
// - LINE 1 = Latitude Center Point
// - LINE 2 = Longitude Center Point
// - LINE 3 = Vertical RATIO (latitude)
// - LINE 4 = Horizontal RATIO (longitude)
// - LINE 5 = Magnetic variation. East Positive (no sign), West Negative (add -)
// - LINE 6 = OPTIONAL, folder inside include, for grouping files


[INFO]
S033.23.39.000
W070.47.37.000
60
51
-1.8
SCEZ
```

AIRPORT INFORMATION - [AIRPORT]

Each row will contain the following fields, and finish with a semicolon (;):

- **REQUIRED** – ID = ICAO Code. Max 4 characters
- **REQUIRED** – Elevation in feet. May be left empty, or completed with a zero (0).
- **REQUIRED** – Transition Altitude in feet. May be left empty, or completed with a zero (0).
- **REQUIRED** – Latitude
- **REQUIRED** – Longitude
- **REQUIRED** – Name, Max 50 characters

```
// AIRPORTS
// Airport name: 4 characters = ICAO-code
// Elevation in feet
// Transition Altitude in feet
// Latitude
// Longitude
// ID: Airport name
// Each field separated by 1 semicolon ";"

[AIRPORT]
SCEL;1555;10000;S033.23.39.990;W070.47.37.690;AP Arturo Merino Benitez;
SCSN;246;0;S033.39.24.000;W071.36.57.000;AD Santo Domingo;
```

Included File:

```
[AIRPORT]
F;SCEZ.apt
```

RUNWAY information - [RUNWAY]

Each row will contain the following fields, and finish with a semicolon (;):

- REQUIRED – ICAO (Airport ID)
- REQUIRED – Runway Number
- REQUIRED – Runway Reciprocal Number
- REQUIRED – Runway Elevation
- REQUIRED – Runway Reciprocal Elevation
- REQUIRED – Runway Track
- REQUIRED – Runway Reciprocal Track
- REQUIRED – Runway Start Latitude
- REQUIRED – Runway Start Longitude
- REQUIRED – Runway Finish Latitude
- REQUIRED – Runway Finish Longitude

```
// RUNWAY
// ICAO
// RWY Number
// RWY Reciprocal Number
// RWY Elevation
// RWY Reciprocal Elevation
// RWY Track
// RWY Reciprocal Track
// RWY START LAT
// RWY START LON
// RWY END LAT
// RWY END LON
// Each field separated by 1 semicolon ";"

[RUNWAY]
SCEL;17L;35R;1555;1555;175;355;S033.22.33.890;W070.47.12.150;S033.24.17.600;W070.47.06.570;
SCEL;17R;35L;1555;1555;175;355;S033.22.19.020;W070.48.13.380;S033.24.22.250;W070.48.06.770;
SCSN;05;23;246;246;053;233;S033.39.16.811;W071.36.43.636;S033.39.31.259;W071.37.09.447;
```

Included File:

```
 [RUNWAY]
F;SCEZ.rwy
```

GATES information - [GATES]

Each row will contain the following fields, and finish with a semicolon (;):

- REQUIRED – GATE ID , Max 20 characters
- REQUIRED – ICAO
- REQUIRED – Latitude
- REQUIRED – Longitude
- REQUIRED – Type = L, M, H, S, G (L = Light, M = Medium, H = Heavy, S = Super, G = General Aviation)

```
// GATES
// GATE ID
// ICAO
// Latitude
// Longitude
// Type = L, M, H, S, G (L = Light, M = Medium, H = Heavy, S = Super, G = General Aviation)
// Each field separated by 1 semicolon ";"

[GATES]
16;SCEL;S033.23.77.000;W070.47.76.000;H;
22;SCEL;S033.23.75.000;W070.47.56.000;M;
```

IMPORTANT NOTE:

If you have a file named **ICAO.gts**, where the ICAO matches an airport declared in the [AIRPORTS] section, it will be automatically loaded in the SectorFile, and does not need to be stated.

IE: **SCEL.gts**

Included File:

```
 [GATES]
F;SCEZ.gts
```

TAXIWAY information - [TAXIWAY]

Each row will contain the following fields, and finish with a semicolon (;):

- <mark>REQUIRED</mark> – Taxiway ID
- <mark>REQUIRED</mark> – ICAO
- <mark>REQUIRED</mark> – Latitude
- <mark>REQUIRED</mark> – Longitude

```
// TAXIWAY
// Taxiway ID
// ICAO
// Latitude
// Longitude
// Each field separated by 1 semicolon ";"

[TAXIWAY]
A;SCEL;S033.23.77.000;W070.47.76.000;
D;SCEL;S033.23.75.000;W070.47.56.000;
```

IMPORTANT NOTE:

If you have a file named **ICAO.txi**, where the ICAO matches an airport declared in the [AIRPORTS] section, it will be automatically loaded in the SectorFile, and does not need to be stated.

IE: **SCEL.txi**

Included File:

```
 [TAXIWAY]
F;SCEZ.txi
```

FIXES information - [FIXES]

Each row will contain the following fields, and finish with a semicolon (;):

- <mark>REQUIRED</mark> - FIX ID
- <mark>REQUIRED</mark> - Latitude
- <mark>REQUIRED</mark> - Longitude
- <mark>OPTIONAL</mark> - Enroute or Terminal FIX

```
// FIXES
// FIX ID
// Latitude
// Longitude
// ENR=0 or TERM=1
// Each field separated by 1 semicolon ";"
[FIXES]
ALDER;S027.05.48.000;W071.09.02.000;0;
LODAM;S029.45.27.000;W071.21.01.000;1;
GILSA;S030.30.59.000;W067.37.53.000;
```

Included File:

```
[FIXES]
F;SCEZ.fix
```

NDB information - [NDB]

Each row will contain the following fields, and finish with a semicolon (;):

- REQUIRED - NDB ID
- REQUIRED - Frequency – xxx.yyy (separated by a dot)
- REQUIRED - Latitude
- REQUIRED - Longitude

```
// NDB
// NDB CODE
// NDB Frequency - xxx.yyy (separated by dot)
// Latitude
// Longitude
// Each field separated by 1 semicolon ";"

[NDB]
CLD;227.000;S027.04.37.000;W070.49.07.000;
TOY;260.000;S030.15.47.000;W071.28.47.000;
```

Included File:

```
[NDB]
F;SCEZ.ndb
```

VOR information - [VOR]

Each row will contain the following fields, and finish with a semicolon (;):

- <mark>REQUIRED</mark> - VOR ID
- <mark>REQUIRED</mark> - Frequency – xxx.yyy (separated by a dot)
- <mark>REQUIRED</mark> - Latitude
- <mark>REQUIRED</mark> - Longitude

```
// VOR
// VOR CODE - 3 characters
// VOR Frequency - xxx.yyy (separated by dot)
// Latitude
// Longitude
// Each field separated by 1 semicolon ";"

[VOR]
DAT;117.100;S027.16.46.000;W070.46.39.000;
SER;116.500;S029.54.56.000;W071.11.49.000;
TOY;115.500;S030.16.35.000;W071.28.25.000;
```

Included File:

```
[VOR]
F;SCEZ.vor
```

LOW AIRWAY ɪɴꜰᴏʀᴍᴀᴛɪᴏɴ - [LOW AIRWAY]

Each row will contain the following fields, and finish with a semicolon (;):

- REQUIRED - Row Type = L for Label, or T for Track.
  Note: You can set multiple labels for the same airway.
- REQUIRED - Airway ID
- REQUIRED - Latitude
- REQUIRED - Longitude

```
// LOW AIRWAYS
// Type = L for Label, T for Track
// Airway ID
// Latitude
// Longitude
// Each field separated by 1 semicolon ";"

[LOW AIRWAY]
L;V200;REPUK;REPUK;
L;V200;DOVRI;DOVRI;
L;V200;UPUKU;UPUKU;
T;V200;ARI;ARI;
T;V200;REPUK;REPUK;
T;V200;IQQ;IQQ;
T;V200;BRADA;BRADA;
T;V200;FAG;FAG;
T;V200;DOVRI;DOVRI;
T;V200;PUNSO;PUNSO;
T;V200;DOVKA;DOVKA;
T;V200;DAT;DAT;
T;V200;UPUKU;UPUKU;
```

Included File:

```
[LOW AIRWAY]
F;SCEZ.lairway
```

HIGH AIRWAY information - [HIGH AIRWAY]

Each row will contain the following fields, and finish with a semicolon (;):

- <mark>REQUIRED</mark> - Row Type = L for Label, or T for Track.
  Note: You can set multiple labels for the same airway.
- <mark>REQUIRED</mark> - Airway ID
- <mark>REQUIRED</mark> - Latitude
- <mark>REQUIRED</mark> - Longitude

```
// HIGH AIRWAYS
// Type = L for Label, T for Track
// Airway ID
// Latitude
// Longitude
// Each field separated by 1 semicolon ";"

[HIGH AIRWAY]
L;UV 200;REPUK;REPUK;
L;UV 200;BRADA;BRADA;
L;UV 200;PUNSO;PUNSO;
L;UV 200;UPUKU;UPUKU;
T;UV 200;ARI;ARI;
T;UV 200;REPUK;REPUK;
T;UV 200;IQQ;IQQ;
T;UV 200;BRADA;BRADA;
T;UV 200;FAG;FAG;
T;UV 200;DOVRI;DOVRI;
T;UV 200;PUNSO;PUNSO;
T;UV 200;DAT;DAT;
T;UV 200;UPUKU;UPUKU;
```

Included File:

```
[HIGH AIRWAY]
F;SCEZ.hairway
```

ARTCC INFORMATION - [ARTCC]

Each row will contain the following fields, and finish with a semicolon (;):

- REQUIRED - Row Type = L for Label, or T for Track.
- REQUIRED - ARTCC ID
- REQUIRED - Latitude
- REQUIRED - Longitude
- OPTIONAL - Font Size

```
// ARTCC
// Type = L for Label, T for Track
// ID
// Latitude
// Longitude
// Font Size (Optional)
// Each field separated by 1 semicolon ";"

[ARTCC]
// - ANTOFA OCC
T;ANTOFA_OCC;S018.21.00.000;W090.00.00.000;
T;ANTOFA_OCC;S018.21.00.000;W073.44.00.000;
T;ANTOFA_OCC;S025.03.52.000;W072.30.06.000;
T;ANTOFA_OCC;S028.30.00.000;W071.46.00.000;
T;ANTOFA_OCC;S028.30.00.000;W090.00.00.000;
T;ANTOFA_OCC;S018.21.00.000;W090.00.00.000;
//
// - EDGG_S_CTR
T;EDGG_S_CTR;N048.46.28.668;E008.01.52.464;
T;EDGG_S_CTR;N048.39.24.000;E007.52.36.000;
T;EDGG_S_CTR;N048.38.46.000;E007.50.06.000;
T;EDGG_S_CTR;N048.35.10.000;E007.48.00.000;
T;EDGG_S_CTR;N048.30.42.000;E007.47.58.000;
T;EDGG_S_CTR;N048.29.52.000;E007.47.00.000;
```

IMPORTANT: Each ARTCC MUST be named differently.

Included File:

```
[ARTCC]
F;SCEZ.artcc
```

ARTCC HIGH ɪɴꜰᴏʀᴍᴀᴛɪᴏɴ - [ARTCC HIGH]

Each row will contain the following fields, and finish with a semicolon (;):

- REQUIRED - Row Type = L for Label, or T for Track.
- REQUIRED - ARTCC ID
- REQUIRED - Latitude
- REQUIRED - Longitude
- OPTIONAL - Font Size

```
// ARTCC HIGH
// Type = L for Label, T for Track
// ID
// Latitude
// Longitude
// Font Size
// Each field separated by 1 semicolon ";"

[ARTCC HIGH]
// - ARI  TMA
T;ARI_TMA;S017.58.44.000;W069.46.46.000;
T;ARI_TMA;S017.59.56.631;W069.45.44.330;
T;ARI_TMA;S018.06.51.560;W069.41.50.638;
T;ARI_TMA;S018.14.21.783;W069.39.26.731;
```

Included File:

```
[ARTCC HIGH]
F;SCAR.hartcc
```

IMPORTANT: Each ARTCC MUST be named differently.

ARTCC LOW information - [ARTCC LOW]

Each row will contain the following fields, and finish with a semicolon (;):

- REQUIRED - Row Type = L for Label, or T for Track.
- REQUIRED - ARTCC ID
- REQUIRED - Latitude
- REQUIRED - Longitude
- OPTIONAL - Font Size

```
// ARTCC LOW
// Type = L for Label, T for Track
// ID
// Latitude
// Longitude
// Font Size
// Each field separated by 1 semicolon ";"

[ARTCC LOW]
// SCAR ATZ
T;SCAR_ATZ;S018.21.53.527;W070.25.28.996;
T;SCAR_ATZ;S018.22.49.805;W070.25.11.010;
T;SCAR_ATZ;S018.23.41.671;W070.24.41.802;
T;SCAR_ATZ;S018.24.27.132;W070.24.02.495;
```

Included File:

```
[ARTCC LOW]
F;SCAR.lartcc
```

IMPORTANT: Each ARTCC MUST be named differently.

SID information - [SID]

Each row will contain the following fields, and finish with a semicolon (;):

- First row is LABEL
  - REQUIRED - ICAO
  - REQUIRED – Runways, if more than one (1), separate them by a colon (:)
  - REQUIRED – SID ID
  - REQUIRED – Latitude
  - REQUIRED – Longitude
- Next rows are TRACK's
  - REQUIRED – Latitude
  - REQUIRED – Longitude

```
// SID
// First ROW for LABEL
// -- ICAO
// -- Runways (if more than one, separate them by a colon " : ")
// -- SID ID
// -- Latitude
// -- Longitude
// Next ROWs for Track's
// -- Latitude
// -- Longitude
// Each field separated by 1 semicolon ";"

[SID]
SCEL;17L:17R;DONT3B;AMB;AMB;
AMB;AMB;
SEKSU;SEKSU;
EL370;EL370;
DONTI;DONTI;
```

IMPORTANT NOTE:

If you have a file named **ICAO.sid**, where the ICAO matches an airport declared in the [AIRPORTS] section, it will be automatically loaded in the SectorFile, and does not need to be stated.

IE: **SCEL.sid**

Included File:

```
 [SID]
F;SCEZ.sid
```

STAR information - [STAR]

Each row will contain the following fields, and finish with a semicolon (;):

- First row is LABEL
    - o REQUIRED - ICAO
    - o REQUIRED – Runways, if more than one (1), separate them by a colon (:)
    - o REQUIRED – STAR ID
    - o REQUIRED – Latitude
    - o REQUIRED – Longitude
- Next rows are TRACK's
    - o REQUIRED – Latitude
    - o REQUIRED – Longitude

```
// STAR
// First ROW for LABEL
// -- ICAO
// -- Runways (if more than one, separate them by a colon " : ")
// -- STAR ID
// -- Latitude
// -- Longitude
// Next ROWs for Track's
// -- Latitude
// -- Longitude
// Each field separated by 1 semicolon ";"

[STAR]
SCEL;17L:17R;UMKA4C;UMKAL;UMKAL;
UMKAL;UMKAL;
LOSAN;LOSAN;
SAFEL;SAFEL;
UGOLA;UGOLA;
```

IMPORTANT NOTE:

If you have a file named **ICAO.str**, where the ICAO matches an airport declared in the [AIRPORTS] section, it will be automatically loaded in the SectorFile, and does not need to be stated.

IE: **SCEL.str**

Included File:

```
 [STAR]
F;SCEZ.str
```

VFR FIX information - [VFRFIX]

Each row will contain the following fields, and finish with a semicolon (;):

- <mark>REQUIRED</mark> – Visual FIX Name
- <mark>REQUIRED</mark> – Altitude
- <mark>REQUIRED</mark> – Latitude
- <mark>REQUIRED</mark> – Longitude

```
// VFR FIXES
// Visual Fix Name
// Altitude
// Latitude
// Longitude
// Each field separated by 1 semicolon ";"

[VFRFIX]
HOLARGOS;2500-4000;N037.59.80.000;E023.48.10.000;
A.KEA;MAX 2500;N037.59.80.000;E023.48.10.000;
```

IMPORTANT NOTE:

If you have a file named **ICAO.vfi**, where the ICAO matches an airport declared in the [AIRPORTS] section, it will be automatically loaded in the SectorFile, and does not need to be stated.

IE: **SCEL.vfi**

Included File:

```
 [VFRFIX]
F;SCEZ.vfi
```

VFR ROUTE information - [VFRROUTE]

Each row will contain the following fields, and finish with a semicolon (;):

- <mark>REQUIRED</mark> – ID
- <mark>REQUIRED</mark> – Latitude
- <mark>REQUIRED</mark> – Longitude

```
// VFR ROUTE
// Route ID
// Latitude
// Longitude
// Each field separated by 1 semicolon ";"

[VFRROUTE]
1;LOFOS;LOFOS;
1;PERATI;PERATI;
2;PERATI;PERATI;
2;MANDILOU;MANDILOU;
```

IMPORTANT NOTE:

If you have a file named **ICAO.vrt**, where the ICAO matches an airport declared in the [AIRPORTS] section, it will be automatically loaded in the SectorFile, and does not need to be stated.

IE: **SCEL.vrt**

Included File:

```
 [VFRFIX]
F;SCEZ.vrt
```

MVA information - [MVA]

Each row will contain the following fields, and finish with a semicolon (;):

- REQUIRED – Type = L for Label, or T for Track.
- REQUIRED – ID
- REQUIRED – Latitude
- REQUIRED – Longitude
- OPTIONAL – Description
- OPTIONAL – Font Size

```
// MVA
// Type = L for Label, or T for Track.
// ID
// Latitude
// Longitude
// Description
// Font Size
// Each field separated by 1 semicolon ";"

[MVA]
L;LG MVA;N038.50.00.000;E022.02.24.000;7500ft;15;
T;LG MVA;N038.50.03.000;E022.03.24.000;
T;LG MVA;N038.49.23.632;E022.04.22.123;
T;LG MVA;N038.48.44.257;E022.05.20.228;
```

IMPORTANT NOTE:

If you have a file named **ICAO.mva**, where the ICAO matches an airport declared in the [AIRPORTS] section, it will be automatically loaded in the SectorFile, and does not need to be stated.

IE: **SCEL.mva**

Included File:

```
 [MVA]
F;SCEZ.mva
```

GEO information - [GEO]

Each row will contain the following fields, and finish with a semicolon (;):

- <mark>REQUIRED</mark> – Starting Latitude
- <mark>REQUIRED</mark> – Starting Longitude
- <mark>REQUIRED</mark> – Ending Latitude
- <mark>REQUIRED</mark> – Ending Longitude
- <mark>OPTIONAL</mark> – Color ID

```
// GEO
// Starting Latitude
// Starting Longitude
// Ending Latitude
// Ending Longitude
// Color ID (OPTIONAL)
// Each field separated by 1 semicolon ";"

[GEO]
// COAST LINE
S048.00.36.101;W074.39.07.700;S047.59.28.702;W074.34.48.202;COAST;
S047.59.28.702;W074.34.48.202;S047.56.58.499;W074.32.03.199;COAST;
S047.56.58.499;W074.32.03.199;S047.58.49.598;W074.27.27.101;COAST;
//
// DANGER ZONES
//
// SC-D01
S030.48.28.000;W071.14.10.000;S030.48.29.153;W071.13.56.369;danger;
S030.48.29.153;W071.13.56.369;S030.48.32.567;W071.13.43.262;danger;
S030.48.32.567;W071.13.43.262;S030.48.38.112;W071.13.31.182;danger;
```

Included File:

```
[GEO]
F;SCEZ.danger
F;SCEZ.restrict
F;SCEZ.prohibit
F;SCEZ.geo
```

POLYLINE information - [FILLCOLOR]

Each row will contain the following fields, and finish with a semicolon (;):

- First row is the Polygon declaration
  - REQUIRED - Polygon Type, Static or Dynamic (Dynamic for use with ATC)
  - REQUIRED – Fill Color
  - REQUIRED – Stroke Width
  - REQUIRED – Stroke Color
  - OPTIONAL – Fill Color Clear, Value 1 = with Opacity
- Following rows for area points
  - REQUIRED – Latitude
  - REQUIRED – Longitude

```
// POLYGONE
// First ROW Polygon declaration
// -- Type / ATC
// -- Fill Color
// -- Stroke Width
// -- Stroke Color
// -- Fill Color Clear, Value 1 = with Opacity
// Next ROWs for area points
// -- Latitude
// -- Longitude
// Each field separated by 1 semicolon ";"

[FILLCOLOR]
STATIC;#00404040;1;#00120000; // rw 03L-21R LGAV
N037.55.17.581;E023.55.07.096;
N037.56.56.164;E023.56.40.442;
N037.56.55.308;E023.56.41.895;
//
LGAV_APP LGAV_DEP;#00120000;1;#00120000;1;
N038.09.56.002;E022.43.58.001;
N038.09.56.002;E024.10.58.001;
N038.12.56.002;E024.15.58.000;
```

IMPORTANT NOTE:

If you have a file named **ICAO.tfl**, where the ICAO matches an airport declared in the [AIRPORTS] section, it will be automatically loaded in the SectorFile, and does not need to be stated.

IE: **SCEL.tfl**

Included File:

```
[FILLCOLOR]
F;SCEZ.tfl
```