

# FACE™ 2.1 Model Report User's Guide

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## Table of Contents

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1	Introduction .....	2
2	Reference Documents/Sites .....	3
3	Tool Setup .....	3
3.1	Prerequisites .....	4
3.1.1	Conformant .face file .....	4
3.1.2	Operating System .....	4
3.1.3	Java Version .....	4
3.2	Installation .....	4
3.2.1	Delivered via Zip File .....	4
3.2.2	Delivered via CTS .....	4
4	Invocation .....	5
4.1	Command Line Options .....	5

4.2	Model Report Tool Invocation.....	6
4.2.1	Invocation Format.....	6
4.2.2	Invocation Example.....	7
4.2.3	Example Invocation Bat File .....	7
5	PDF Theme.....	8
6	HTML Style Sheet.....	8
7	Workarounds to AsciiDoc Limitations.....	9
7.1	File Size Limitation when Converting to PDF or HTML .....	9
7.2	Character Set Limitation.....	9
8	Acronyms.....	10

## Revision History

Date	Modifications
4/6/2021	Initial Draft
5/3/2021	Described how to use PDF themes to change font sizes for the generated pdf file.
5/12/2021	Added documentation for the new switch - do_not_replace_unsupported_characters Added information in the “Character Set Limitation” section about the unsupported characters that are automatically replaced. Updated the Java version information to reflect the version of Java required with the next CTS release.
5/26/2021	Updated the examples for invoking the Model Report Tool to use v2021.05.2. Added documentation that indicates that the blue text in the reports are links. Updated the install instructions to address CTS installations.

## 1 Introduction

Future Airborne Capability Environment (FACE™) Technical Standard is a consortium developed standard of The Open Group. For more information on this standard see

<https://www.opengroup.org/face>

<https://prod.opengroup.org/face/docsandtools>

This document provides information on the setup and use of the FACE 2.1 Model Report Tool.

The Model Report Tool is a command line tool that:

- 1) Reads a FACE 2.1 USM XMI (i.e. .face) file
- 2) Creates a .adoc file (AsciiDoc file)
- 3) Optionally generates a PDF and/or HTML file

Notes:

- 1) There is an option to produce a report for the entire .face file or produce a report for one or more Unit of Portability (UoPs).
- 2) The blue text in the produced pdf/html files are links to other portions of the document.

## 2 Reference Documents/Sites

Table 1 lists the reference documentation.

Ref. ID	Document/Site	Date/Revision	Links/File-Name where Applicable
[1]	FACE™ Technical Standard, Edition 2.1	Release 2017-814	<a href="https://publications.opengroup.org/">https://publications.opengroup.org/</a> Search on c145
[2]	FACE™ Document and Tools Site	N/A	<a href="#">DOCUMENTS &amp; TOOLS   The Open Group Website</a>
[3]	FACE™ Conformance Test Suite(s) Site	N/A	<a href="#">FACE Conformance Test Suite(s)   The Open Group Website</a>
[4]	FACEConformanceTestSuite-2.1.1r6.zip	2.1.1r6	Conformance Test Suite located at the website [3] above.
[5]	Candidate Conformance Test Suite Manual For Testing Interface and Application Code Against The FACETM Standard 2.1.1	Tool Version 2.1.1r6	See reference [4] above for the location of the zip file with this manual. The document file name is Manual.pdf and is located in the docs folder.

Table 1 – Reference Documents

## 3 Tool Setup

This section describes the steps necessary to setup the Model Report tool.

## 3.1 Prerequisites

### 3.1.1 Conformant .face file

The Model Report Tool assumes the FACE 2.1 USM XMI (i.e. .face) file is valid. To insure the FACE 2.1 USM is valid, use the FACE Conformance Test Suite (CTS). Reference [4] shows a recent version of the CTS. In general, the latest version of the CTS should be used.

If the .face file is non-conformant, the results of running the ModelReport are unknown.

### 3.1.2 Operating System

The Model Report Tool was developed and tested on Windows 10 64 bit version. It may/may-not run on other operating systems (e.g. Linux), but in any case, Windows 10 is the only supported operating system.

### 3.1.3 Java Version

The Model Report code was developed with Java 1.8 32 bit. Although not tested with later versions, later versions of Java should work as well as the 64 bit versions.

CTS requires Java 1.7 (see Reference [4]); however, the next release of CTS will require Java 1.8. The Model Report Tool will probably be delivered with the next version of CTS; therefore, testing will be conducted with Java 1.8.

## 3.2 Installation

The Model Report Tool is delivered via a zip file or as part of a CTS installation. A discussion of the install process for these two cases follows:

### 3.2.1 Delivered via Zip File

For the case where The Model Report Tool is delivered via a zip file, the naming of the file is as follows:

FACE21ModelReport-<version>.zip

where <version> is of the form vyear.month.number, e.g. v2021.05.2

e.g. FACE21ModelReport-v2021.05.2.zip

Copy the zip file to a folder on your machine and unzip it. Once unzipped, the installation is complete. The next section explains how to invoke the Model Report Tool.

### 3.2.2 Delivered via CTS

For the case where The Model Report Tool is delivered via CTS, installing CTS results in a folder (with the other CTS folders) on your file system titled “FACEModelReport”, which contains the

files necessary to run the Model Report Tool as well as the Model Report Tool documentation (i.e. User's Guide). No other install steps are required other than installing CTS.

The "FACEModelReport" folder is located at CTS\_ROOT\face\_conformance\_app\java\_apps\

The next section explains how to invoke the Model Report Tool.

## 4 Invocation

The Model Report Tool is invoked from a command line. The following sections describe the command line options and how to invoke the tool.

### 4.1 Command Line Options

The command line options are shown in Table 2:

Switch	Required/ Optional	Parameter	Example Parameter	Comment
-h	Optional	None	N/A	Displays the help information. Do not use with other options.
-in	Required	<Input-FACE-XMI-File >	FACE_21_SDM_2134_BALSA_UoP_From_GME.face	Input .face file
-out	Required	<Output-AsciiDoc-File>	Model_Report_Generated.adoc	Output AsciiDoc file
-uops	Optional	<comma delimited names>	ADSB,ATCManager,AirConfig,EGL	If not specified, all UoPs are included in report. The regular expression for a UoP name is: [a-zA-Z0-9_]+
-out_uop_names	Optional	<Output-Text-File>	UoPNames.txt	Outputs a file with the list of UoP names in the entire .face file.
-report_format	Optional	pdf / html / pdf_and_html	pdf	If not specified, only the -out file will be created. The created file is named the same as the -out file except the suffix would be .pdf or .html instead

Switch	Required/ Optional	Parameter	Example Parameter	Comment
				of .adoc.
- do_not_populate_d escription_fields	Optional	None	N/A	This will exclude descriptions in the model (i.e. .face file) from the report.
- do_not_replace_un supported_charact ers	Optional	None	N/A	By default, characters that are known to not be supported by AsciiDoc are removed from description fields and replaced with a similar/equivalent character. If this switch exists, the removal/replaceme nt of those characters will not occur.

**Table 2 – Command Line Options**

Note – In Table 3, the Switches are case sensitive and the Parameters are case insensitive.

## 4.2 Model Report Tool Invocation

This section describes how to invoke the Model Report Tool from a command prompt window or a PowerShell window.

Note that Java must be in the system path. This is typically done by the Java installer.

### 4.2.1 Invocation Format

The Model Report Tool is delivered via a zip file or as part of a CTS installation. A discussion of the invocation process for these two cases follows:

#### 4.2.1.1 Delivered via Zip File

The format for the invocation follows:

```
java -jar <directory path to install path>\FACE21ModelReport-<version>\
FACE21ModelReport<version>\FACE21ModelReport-<version>.jar -in <.face file name> -out
<AsciiDoc file name> -report_format <report format>
```

where the parameters are shown in Table 3.

#### 4.2.1.2 Delivered via CTS

The format for the invocation follows:

```
java -jar <directory path to the CTS FACEModelReport folder>\
FACE21ModelReport<version>\FACE21ModelReport-<version>.jar -in <.face file name> -out
<AsciiDoc file name> -report_format <report format>
```

where the parameters are shown in Table 3.

Parameter	Example Value
<directory path to install path>	C:\FACE
<version>	v2021.05.2 for a beta release, v2021.05.1_beta
<.face file name>	FACE_21_SDM_2134_BALSA_UoP_From_GME.face
<AsciiDoc file name>	Model_Report_Generated.adoc
<report format>	pdf

Table 3 – Invocation Example Parameters

#### 4.2.2 Invocation Example

An example for the case where the Model Report Tool is delivered via a zip file with the values filled in follows:

```
java -jar C:\FACE\FACE21ModelReport-v2021.05.2\FACE21ModelReport-
v2021.05.2\FACE21ModelReport-v2021.05.2.jar -in
FACE_21_SDM_2134_BALSA_UoP_From_GME.face -out Model_Report_Generated.adoc -
report_format pdf
```

In the above example, the following file must be in the directory from which the command is entered via a command prompt window or a PowerShell window.

FACE\_21\_SDM\_2134\_BALSA\_UoP\_From\_GME.face

Note – An example is not provided for the case where the Model Report Tool is delivered via CTS, but the format is very similar. See Section 4.2.1.2 for the explicit differences.

#### 4.2.3 Example Invocation Bat File

The Model Report Tool has the following folder\file

ancillary\_files\invoke\_model\_report.bat

This bat file contains examples of invocations of the Model Report Tool. You can edit the “set “ fields for your install location and particular version of the Model Report Tool. This should make it easier to setup a bat file for your installation. Note – This bat file was setup for the case where the Model Report Tool was delivered via a zip file. This bat file will have to be modified for the case where the Model Report Tool was delivered via CTS. See Section 4.2.1.2 for the explicit differences.

## 5 PDF Theme

The theme for applying styling (e.g. font size) for the generated pdf is located at:

```
<directory path to install path>\FACE21ModelReport-<version>\
FACE21ModelReport<version>\themes\modelreport-theme.yml
```

If you would like to change font size or other styling characteristics, edit this file. The changes will automatically be applied to the next time you run the Model Report Tool.

As an example, to change the overall font size, change font\_font\_size and line\_height\_length as shown in Figure 1.

```
#font_size: 11.2
#line_height_length: 16
font_size: 10.0
#line_height_length: 15
# correct line height for Noto Serif metrics
line_height_length: 12
#font_size: 11.25
#line_height_length: 18
line_height: $base_line_height_length / $base
```

Figure 1 – PDF Theme, Font Size Fields

## 6 HTML Style Sheet

The Model Report Tool will generate html files; however a style sheet is needed to optimize the appearance of the report. A style sheet is provided in the Model Report zip file at the following location.

```
ancillary_files\asciidocdoctor.css
```

To optimize the rendered appearance, copy this style sheet to the location of the generated html file before opening the html file with a browser.

Alternatively, you can search for other AsciiDoc style sheets that may provide different renderings that you prefer.



## 7 Workarounds to AsciiDoc Limitations

The Model Report Tool uses the AsciiDoc Java API, which has some limitations. The following sections describe the limitations and the workarounds.

### 7.1 File Size Limitation when Converting to PDF or HTML

There is no size limitation on the Model Report Tool generation of the .adoc file. However, when converting the .adoc file to a pdf or html file, there are size limitations. You will know if this limitation is reached if the Model Report Tool returns the following error:

```
java.lang.OutOfMemoryError: Java heap space
```

To work around this problem, you must factor the model into subsets per the following instructions.

1. Invoke the Model Tool Report with the `-out_uop_names` option (see Table 3). This will create a file containing a comma delimited list of UoP names. To save time do not use the `-report_format` switch. This will skip the step (creating the pdf or html file) that led to memory error.
2. Use the `-uops` switch (see Table 3) with a subset of the UoPs listed in the file from Step 1.

Typically, you would try with  $\frac{1}{2}$  the UoPs and if the memory error still occurred, then use  $\frac{1}{4}$  the UoPs and so forth until the sizing is such that the memory error no longer occurs. Once the optimum sizing is achieved, then multiple runs would be necessary to cover all UoPs in the model.

### 7.2 Character Set Limitation

The AsciiDoc Java API, when converting the .adoc file to a .pdf/.html file, supports a subset of the characters that could be in a .face file. In particular, the issue is usually around the description fields. If there is a character set error, the error will appear as follows:

```
UTF-8 Error
```

The workaround to address this problem is to use the switch

```
-do_not_populate_description_fields (see Table 3).
```

This will skip populating the description fields in the .adoc file and thus those fields will not be in the .pdf/.html files.

If you encounter an unsupported character, please report this to the Vanderbilt FACE™ team such that the character can be automatically replaced per the description that follows:

By default, the known set of unsupported characters are automatically replaced with supported characters. The known unsupported characters are shown in Table 4.

Unsupported Character	Replace With
' (Hex Code: 2019)	' (Hex Code: 27)

Table 4 - Known Unsupported Characters and Their Replacement Characters

To turn off this replacement use switch:

-do\_not\_replace\_unsupported\_characters

## 8 Acronyms

Acronym	Description
API	Application Programming Interface
BALSA	Basic Avionics Lightweight Source Archetype
CTS	FACE Conformance Test Suite
FACE™	Future Airborne Capability Environment
USM	UoP Supplied Model
UoP	Unit of Portability
XMI	Extensible Markup Language Metadata Interchange
XML	Extensible Markup Language