ORT TOOL USER MANUAL

INTRODUCTION

The ORT Tool is a Windows Desktop application that allows users to generate, manipulate, and export Owner Resource Table (ORT) files to be loaded onto target hardware.

SYSTEM REQUIREMENTS

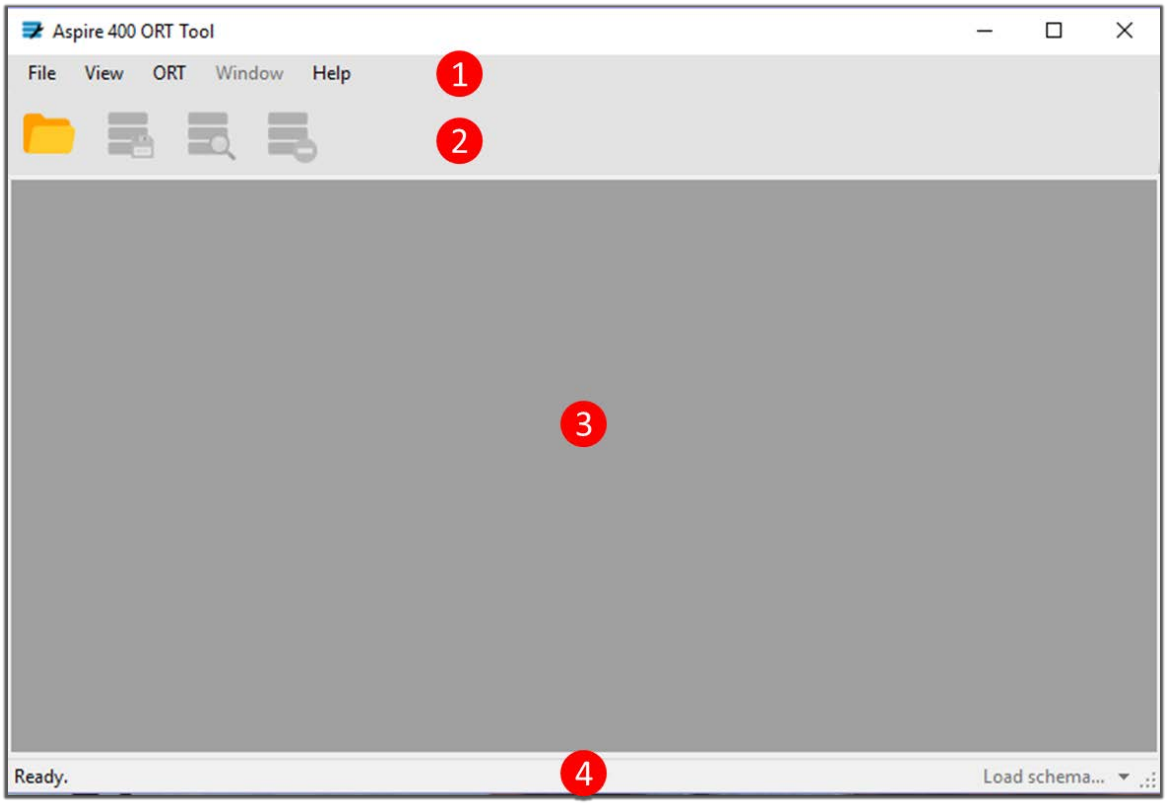
- A desktop running Windows 8 or higher (Windows 10 is recommended)
- 4 MB of disk space
- 12 MB of RAM
- .NET Framework 4.6.1 or higher
- Microsoft VC++ 2017 Runtime

HOW TO INSTALL

The ORT Tool installation package comes with two files, **setup.exe** and **OrtToolSetup.msi**. Double click the setup.exe file and follow the instructions on screen.

USAGE

When the ORT Tool is run, the home screen will appear on the desktop:



1. The Menu Bar contains access to all the functions and settings within the tool, such as opening the schema, exporting ORTs, creating and loading save selection files, help information, and application settings.
2. The Tool Bar provides easy access to common functions. From left:
    a. Open
    b. Create Save Selection
    c. Find Parameter
    d. Show Error List
3. The Main Screen will present both User and Secure ORT data once a schema has been loaded into the application.
4. The Status Bar contains information about progress, the name, and the version of the currently loaded schema.

SETTINGS

The ORT Tool settings can be accessed via “File → Settings”. The settings dialog contains two features: ORT Secure Access enabling and File Repository Locations.

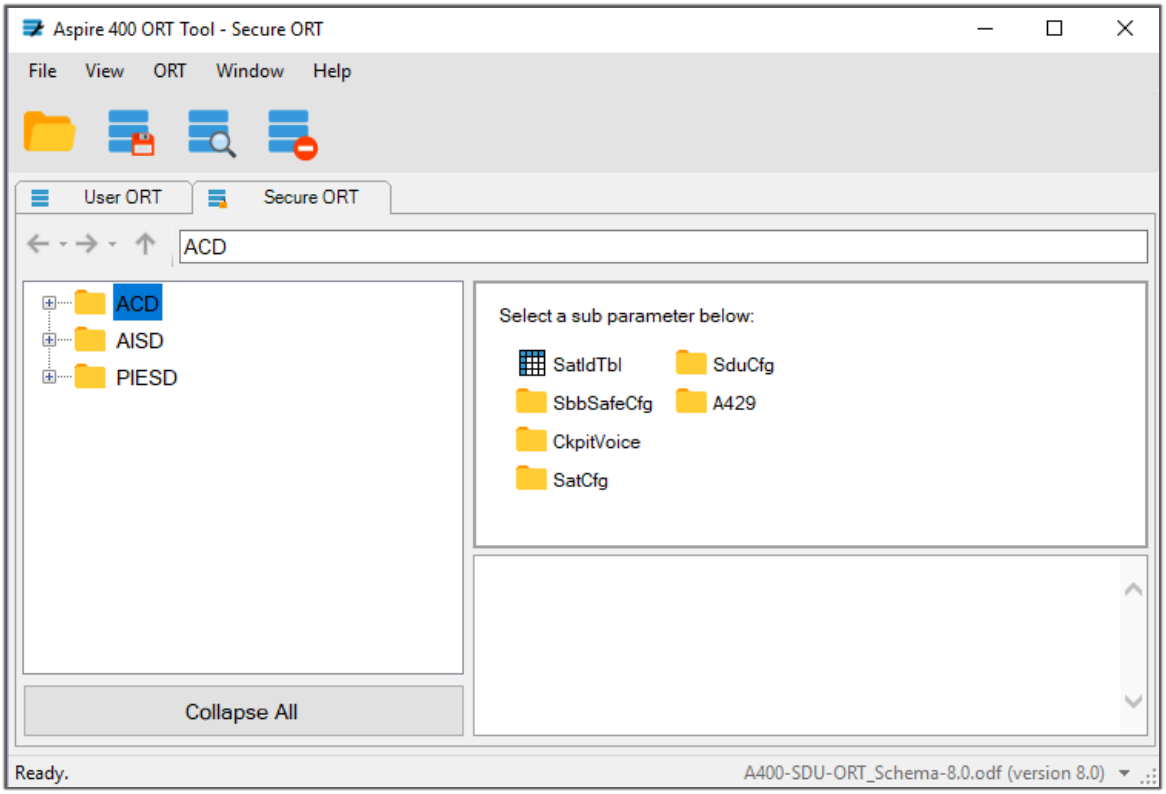
File Repository Locations refers to selecting base file locations for Saved Selections and Schemas, allowing for quicker file browsing when loading or saving, importing or exporting files.

The ORT Tool will only allow the export of Secure ORTs if the capability is enabled. Checking the box in the Settings dialog will display a password prompt. The password is supplied exclusively to personnel who have responsibility for generating legitimate ORTs that are to be controlled, managed, and installed on airworthy systems.

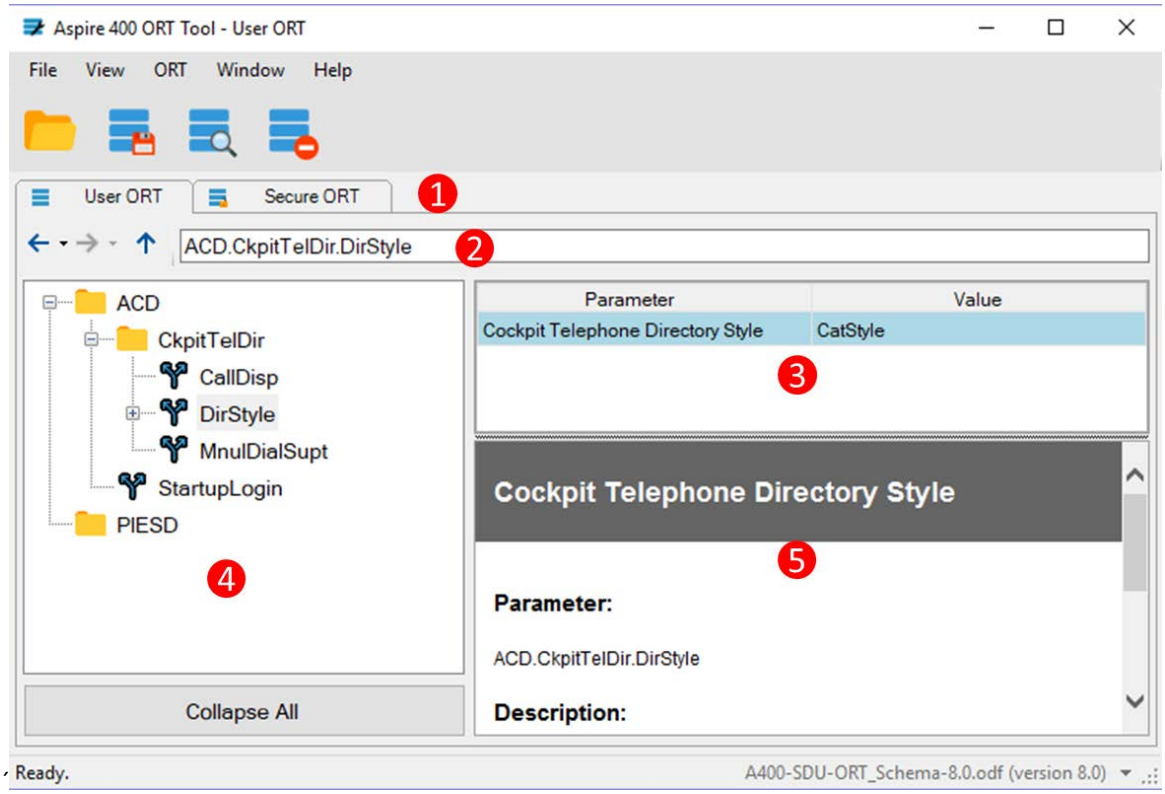
OPENING AN ORT SCHEMA

To generate User and Secure ORT data, an ORT Schema File must first be loaded into the ORT Tool. Only validated Schema files can be loaded; Such Schemas are digitally signed and others will not be accepted by the ORT Tool. From the Home Screen:

1. Click the Open icon on the Tool Bar or select "File → Open → ORT Schema…" from the Menu Bar. A file dialog will appear on screen.
2. Navigate to the folder containing the ORT Schema File you wish to load. Files within the dialog window will be filtered to .ODF, which is the default extension for schema.
3. Select the target ORT Schema File, and click "Open". The tool will begin importing the schema. A dialog will appear to indicate success or failure of the Schema loading. Attempting to load an untrusted or invalid Schema which has not been digitally signed will result in a failure message to that effect.
4. The tool will prompt you to load Saved Selections for both User and Secure ORT documents. If you do not have Saved Selections you wish to continue working from, click "No" and skip to step 8.
5. If you click "Yes" a new Import dialog will open with blank checkboxes to optionally import either User or Secure ORT Save Selections. Each option you check will have a "Select File" button that will open further file dialog windows for you to navigate to the Saved Selection file you wish to import. Saved Selection files have, by default, the .INI file extension. After identifying your Saved Selections for import, click "OK" in the Import dialog. The ORT Tool will launch dialogs notifying of the import progress.
6. If the Saved Selection file version does not align with the version of the current schema, a prompt will appear to confirm this is the desired import. It is an expected capability to load an older version Saved Selection if you are attempting to export new ORT files for an updated version Schema. The import process then will use all possible selections from the imported file to populate the ORT data. The ORT Tool will NOT prompt whether the Save Selections are missing data for parameters the Schema has or whether the Save Selections contain data for parameters that do not exist in the Schema.
7. When the Saved Selection import is complete a dialog will indicate how many ORT parameter values have been updated.
8. The Main Screen is now populated with all ORT parameter information, User and Secure separated into their own tabs:


Aspire 400 ORT Tool - Secure ORT
File
View
ORT
Window
Help
User ORT
Secure ORT
ACD
ACD
AISD
PIESD
Select a sub parameter below:
SatIdTbl
SduCfg
SbbSafeCfg
A429
CkpitVoice
SatCfg
Collapse All
Ready.
A400-SDU-ORT_Schema-8.0.odf (version 8.0)

ORT NAVIGATION



After loading the schema, you can switch between the User or Secure ORT parameters using the Document Tab View (1). Navigate through the ORT Parameter tree using the Tree View (4) on the left, or Navigation Bar (2). Select a node within the tree to show that node's details in the Editor View (3). In the example screen above, The parameter **ACD.CkpitTelDir.DirStyle** was selected to reveal the parameter's name and value in the editor. Use the Information Pane (5) below the Editor View to learn more about the selected parameter, including the type and format of values the parameter can store, and the cross-dependencies parameters can have on each other and their values.

EDITING ORT PARAMETERS

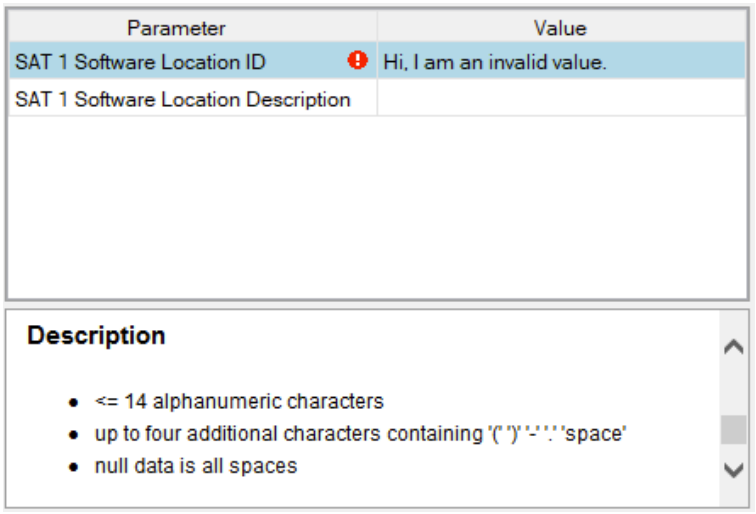
The Value column in the Editor View is context sensitive; that is, the editor interface changes depending upon the parameter's value type:

- String parameters use a basic text editor
- Numeric parameters use an "Up-Down" number editor to increment or decrement values
- Enumerated (or "Switch") parameter values are selected via a dropdown list

To update a parameter's value, click on the cell next to the parameter's name and set the value. Either click away from the editing cell or hit the Enter key to confirm the change. The ORT Tool will automatically validate the new value against the rules declared within the currently loaded schema.

> *You won't be able to export an ORT until all values are validated.*

If the new value is deemed invalid, an error icon will appear to the right of the parameter's name:



Hover over the icon with the mouse cursor to view the error details. You can also view the entire list of invalid parameter values in the Error List Tab. To learn more, see the "Viewing Errors" section of this document.

> *To prevent overwriting of validated settings, the ORT Tool does NOT prompt to save your session details on exit. If changes have been intentionally made to the parameters then it is recommended to create new Save Selection files as described in the following section.*

SAVE SELECTION FILES

Bulk editing of ORT parameters can be done through the saving and loading of Selection Save files. These files contain a list of parameters along with their corresponding values. To create a Save Selection:

1. Select the User or Secure ORT Tab you wish to save.
2. Click the Save Selection Button on the Tool Bar, or "ORT → Create Save Selection…" in the Menu Bar. A save dialog will appear.
3. Navigate to the folder you wish to create the file in, and specify the name of the file in the text box. Click the **Save** button when finished. The tool will notify you with a dialog window if the save was successful.

> *Save Selection files are formatted similarly to INI files used by the Windows OS.*

If a Save Selection file is loaded into the ORT Tool, parameters within the ORT will be overwritten with values specified in the file. To load a Selection:

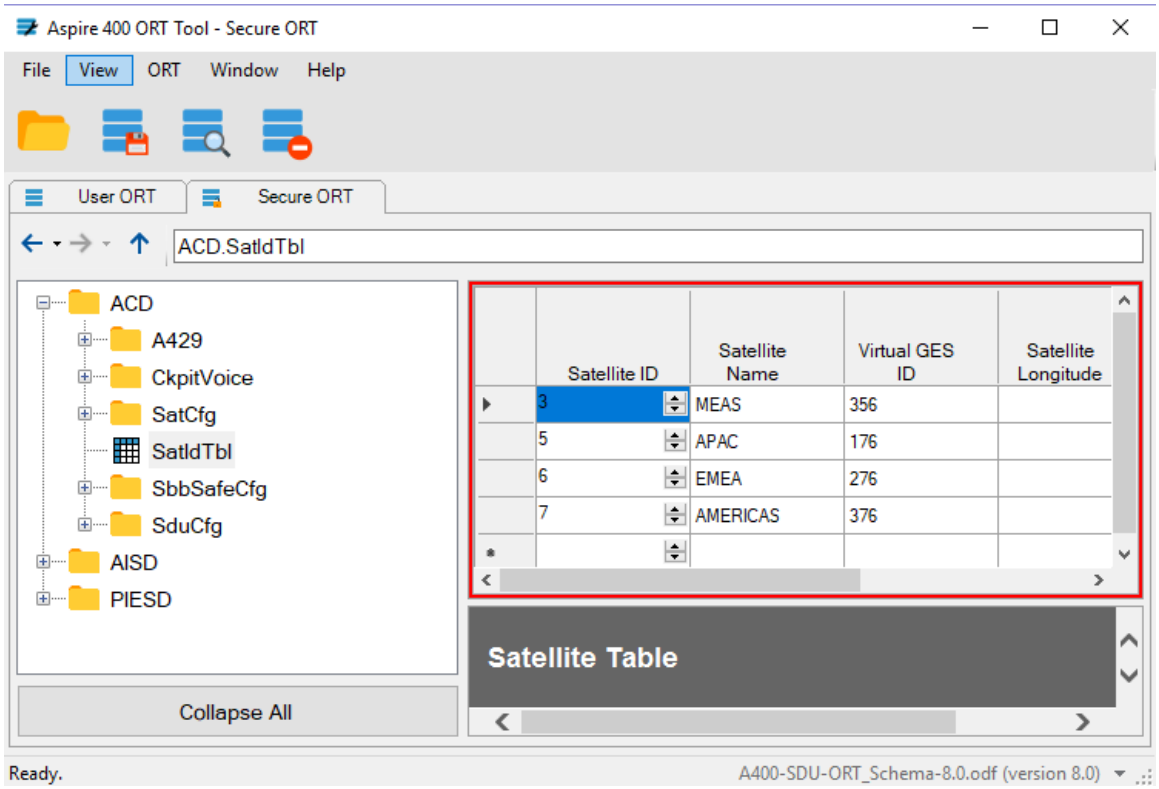
1. Select the User or Secure ORT Tab you wish to overwrite.
2. Click "ORT → Apply Save Selection…" in the Menu Bar. An open dialog will appear.
3. Navigate to the folder and file you wish to load. The dialog will filter out any files that do not end in ".ini" by default. Select the target file and click "Open".
4. The ORT Tool will prompt you for confirmation; once the process begins, any unsaved values will be overwritten by the tool. Click "Yes" to proceed or "No" to cancel.

5. If the Saved Selection file version does not align with the version of the current schema, a prompt will appear to confirm this is the desired import. It is an expected capability to load an older version Saved Selection if you are attempting to export new ORT files for an updated version Schema. The import process then will use all possible selections from the imported file to populate the ORT data. The ORT Tool will NOT prompt whether the Save Selections are missing data for parameters the Schema has or whether the Save Selections contain data for parameters that do not exist in the Schema.
6. Once the process is complete, the tool will notify you with how many parameters were updated with a dialog window.

> *Saved Selections that do not contain values for parameters the loaded Schema contains will leave those values as they are at the time of loading (blank or otherwise) and entrust the flagging of errors to the validation function.*

SPECIAL PARAMETER TYPES

Some parameters, such as Satellite Tables and Telephone Directories, have multiple values associated with them; these parameters are represented by a table of rows and columns.



Cells in the table are context sensitive and will have a different interface depending on the column's value type. The bottom-most row is the New Row Editor; adding values to the columns in this row will create a new row for the entire table. To delete a row, right click anywhere within the row; a context menu will appear near the mouse cursor. Click "Delete Row" to remove the row from the table.

Tables with invalid rows will appear with a red border; the specific error information is contained within the Error List Tab (see the "Viewing Errors" section for details).

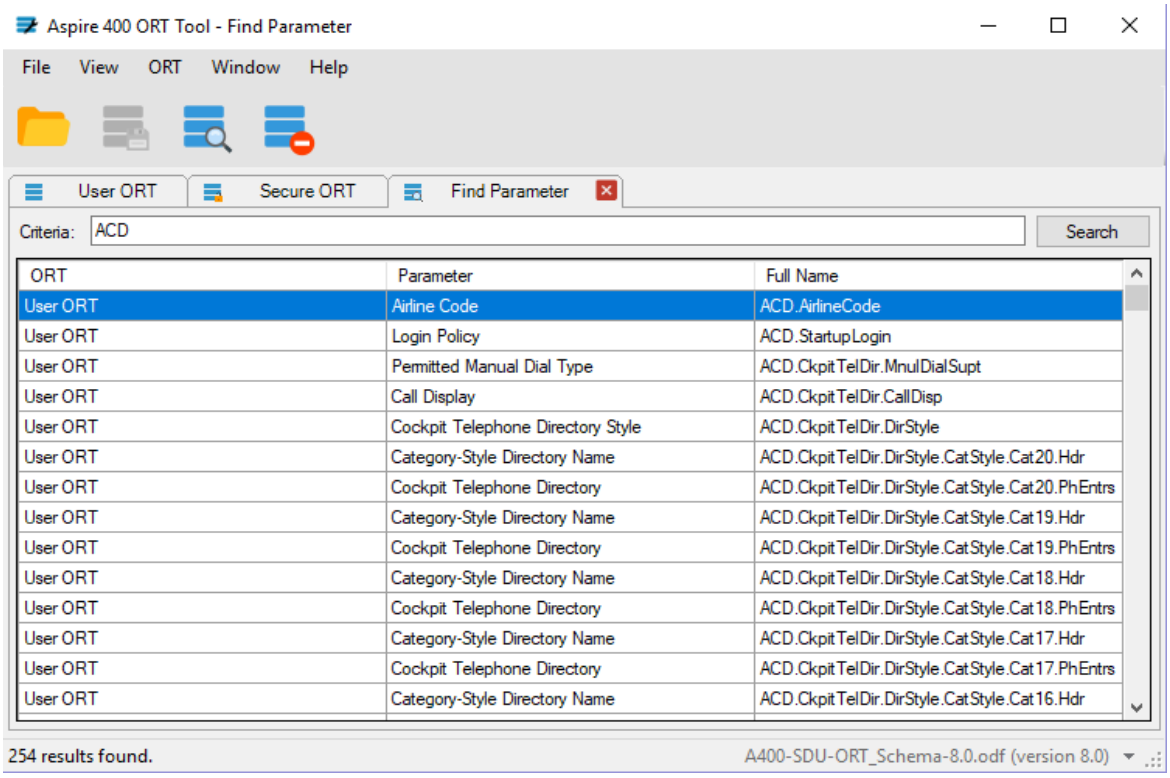
IMPORTING SATELLITE ID TABLES

Satellite Tables contain information directly provided by the satellite network company. To ensure the data is accurate the tables are provided in a digitally signed file, separately from the Schema, and are not included in Secure ORT Saved Selection files. This means that every session with the ORT Tool will require the import of a Satellite ID Table:

1. Click "ORT → Import Satellite Table …". A file dialog window will open, located in the default schema repository, and filtered for .CSV file extension.
2. Browse to and select the most recent signed sat table and click "Open".
3. A dialog will prompt to confirm you wish to overwrite the table loaded in the current session. Click "Yes".
4. A status dialog will appear to indicate whether the table loaded successfully or not. If successful, the message will indicate that a single table has been updated. If the file is not a valid Satellite Table or is not properly signed, then the message will indicate the issue. Click "OK" to continue.

SEARCHING FOR PARAMETERS

To locate a parameter or group of related parameters within the User and Secure ORT, use the Find Parameter Tab. To show the tab, click the **Find Parameter** button on the Tool Bar, or click "ORT → Find Parameter…" in the Menu Bar. The tab will appear alongside the User and Secure ORT Tabs:

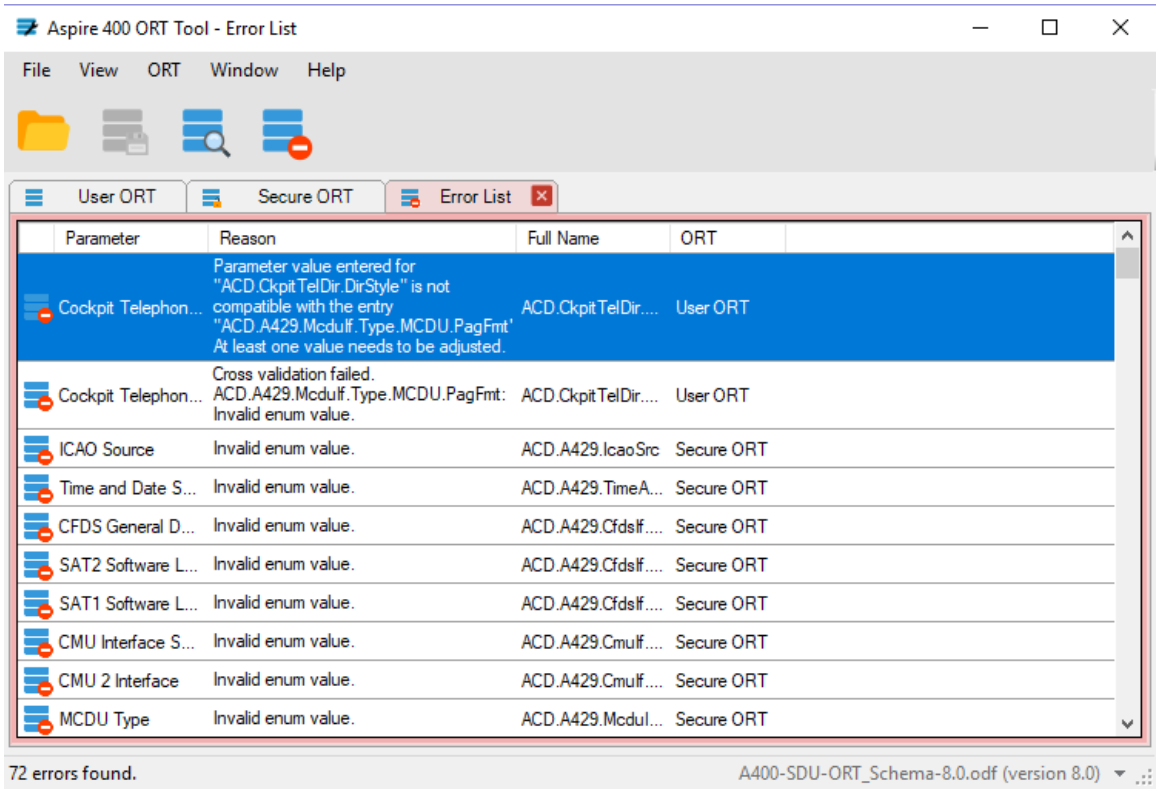


Type in your search criteria in the text box labeled, “Criteria:”. You can search by parameter name, full name, key words, and domain type (i.e. ACD, AISD, PIESD). Press Enter or click the “Search” button; all search results will appear underneath the search bar. Double click a search result to jump to the parameter in the corresponding User ORT or Secure ORT Tab.

> *Parameter description Information is not included in the search.*

VIEWING ERRORS

Sometimes a User ORT or Secure ORT can contain parameters with several invalid values. To view a list of these errors, click the Show Error List button on the Tool Bar, or “View → Error List” in the Menu Bar:



Each row will contain full identification of the parameter, the cause of the error, and the location of the error.

Double click on an entry in the list to view the parameter in the corresponding User or Secure ORT Tab.

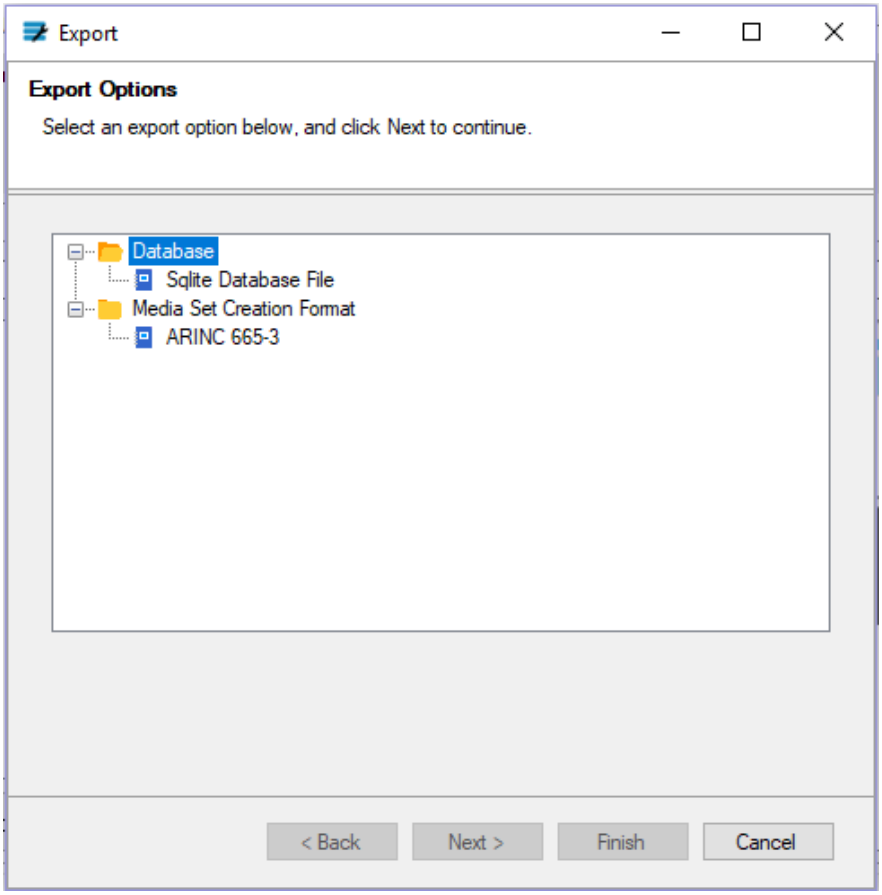
In the ORT Tab view, the Information Pane always displays information about a selected parameter and its dependencies and limitations. In the case of an error, this information can prove useful to identify the issue and its solution.

> *To create only valid ORTs the Tool validates all values against the parameters in the Schema. The tool will not allow the exportation of an ORT that has errors and is invalid.*

EXPORTING AN ORT

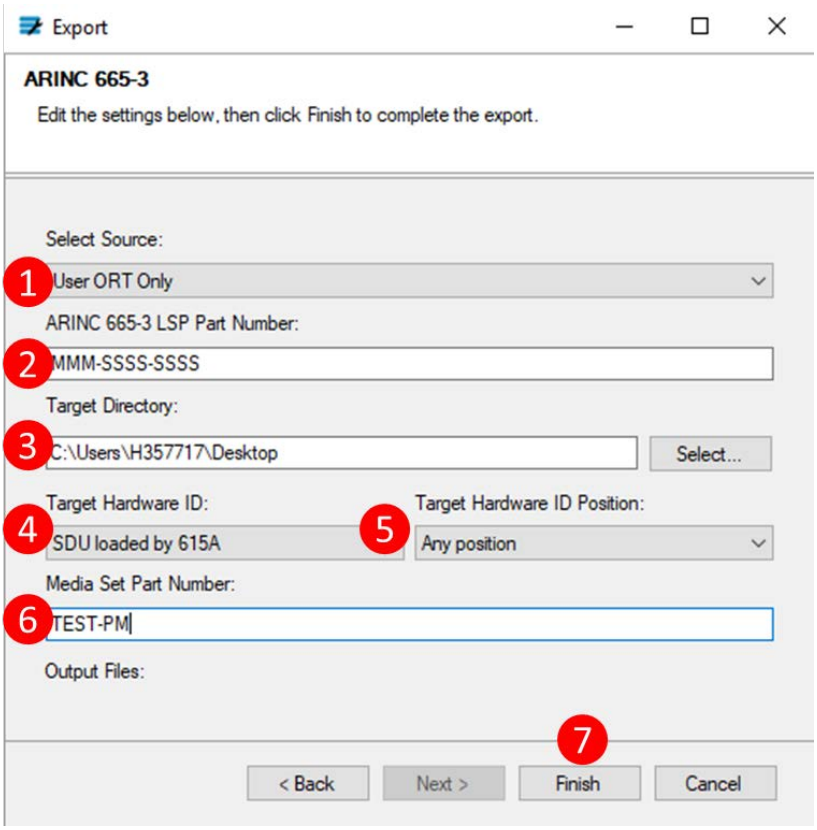
Once changes have been made, and all errors have been cleared from the ORT, the parameters can now be exported to a database file or a dataload package to be used on the target hardware. To initiate an export:

1. Select the User or Secure ORT Tab you wish to export, then click "File → Export…" in the Menu Bar:



> *The **Media Set Creation Format** Option will generate Loadable Software Parts (.LUH and .LUP files) containing the ORT data, and will create media set designed for use by dataloaders that support the A665 protocol.*

2. Select the export option that corresponds to the output you wish to generate, then click the **Next** button.
3. Follow the instructions in the Export Options dialog, then click **Finish** to complete the export:



In the Export dialog for the ARINC 665-3 media set, the following information must be filled to complete the export procedure.

1. Select source: choose which ORT you intend to export.
2. ARINC 665-3 LSP Part Number: Enter a valid LSP part number in the format of MMM-SSSS-SSSS. MMM should be the upper-case alpha-numeric software supplier code assigned by ARINC. SSSS-SSSS is the software supplier unique product identifier, an alpha-numeric excluding “I”, “O”, “Q”, “Z’ or blanks. The part number will be used as the file name for. LUH and .LUP files in the format MMMCCSSSSSSSS, where the check characters CC are automatically generated by the tool as per the ARINC665-3 algorithm.
3. Target Directory: Click “Select” to open file dialog box and navigate to the directory in which you wish to save the media set. You can also enter the path to the folder in the text field, it will validate the file path as you type, with an error message “Invalid file path” for any inaccurate file path string.
4. Target Hardware ID: Currently there is only one option for this LSP parameter, “SDU loaded by 615A”.
5. Target Hardware ID Position: This LSP parameter contains 3 dropdown options, “Any position”, “SDU 1 (Left) only”, and “SDU 2 (Right) only”. Specific position is only used when left and right SDUs require unique load.
6. Media Set Part Number: This part number parameter is used for the transport media set, and is mutually agreed to by both the aircraft manufacturer and the creator of the software. The Media Set PN is up to 15 character including delimiters, with no blanks, and last character is not a hyphen (“-“). Although not enforced, it is recommended by ARINC that the alphabetic character “I”, “Q”, and “Z” are not to be used.

7. When all the above are entered correctly, click “Finish”. A folder will be created in the target directory and will contain all the outputs necessary for dataload.

TROUBLESHOOTING

COMPATIBILITY WITH SCHEMA

Although the ORT schema file is independent of the ORT Tool, the Tool itself contains various schema files that validate all schema upon opening and loading. The XSD schema validation file ensures that any updated Schema will still be readable by the ORT Tool. The ORT Tool and the XSD schema validation file are designed to be backwards compatible with Schema. However, in the case where newer Schema have a significantly updated design, older versions of the ORT Tool may not be fully compatible. An error dialog indicating that the Schema being loaded may be too new for the current version ORT Tool and the software may need to be upgraded.