

Building a Command File for Copper Weight Checking (Quick-Start User Guide)

Notice

Representations in this User Guide are meant as an overview and quick reference. Full details can be found in the On-Line manuals located at the *ADIVA Corporation* website - www.adiva.com

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Getting Started...

ADIVA DRC Checks are basically run by a command file either created by hand or by the interface GUI. Building a group of checks directed by copper weight first requires “seed” command files be created and identified by layer type and copper weight. “Seed” command files contain the checking parameters for a given type of layer and its copper weight construction.

Contact Adiva directly if you need help to understand the structure of a Custom_Check command file and how it works. Then, build your “seed” command files listing the checks to run by layer type and copper weight.

Getting Started...

A few pointers...

Create your “seed” command files with a .mac file extension. This will allow the system to list command files when needed.

Place “seed” command files in the Adiva “data” directory by default or as custom defined in Command_Builder’s **ENVIRONMENT_VARIABLE** setting.

See page 20 of this User Guide for details in how to set/adjust Command Builder’s environment variable.

Create “seed” command files with an easily identifiable file name such as:

cu_outer_0.5.mac -or-
cu_inner_2.0.mac ...etc

Be sure to include all of the various checks desired for a particular copper weight and layer type

Building Individual “Seed” Command Files

Custom_Checking command files are manual checking instruction files for Adiva's DRC checking tool. When selected, these files process various checks as defined in the files without the need to use a GUI for execution.

For checking by layer type and copper weight, multiple "seed" command files need to be created that define desired checks for a particular layer type and its copper weight. These are in standard Adiva command file format yet their construction is critical...

- "Seed" commands must start on line 2 with a layer type and weight identifier

- "Seed" commands must contain layer activation definitions

- "Seed" commands contain various checks desired

- "Seed" commands must contain layer deactivation definitions

These "seed" command files are selected by the Command Builder tool based on layer type and copper weight definition then combined into a master DRC checking command file for use by Adiva DRC.

The “seed” command file must have a header that begins on line 1 with a comment “#” and with a layer type and copper weight identifier on line 2...

```
#  
#!copper_ ...
```

...then depending on the layer type and copper weight more data is added to the second line to identify the intent of the command files contained in this file. The Command Builder tool uses this line to identify and choose “seed” command files.

As an example, if you are creating a “seed” command file for an inner layer with 0.5 ounce copper, your layer type and weight identifier (line 2) will look like this...

```
#  
#!copper_inner_0.5
```

Other options for layer type are “**outer**” and “**plane**” (polarity does not matter).

The flexibility provided by this layer type and copper weight identifier allows the creation of multiple “seed” command files for different copper weights. For example if you need checking parameters for inner layers constructed with 0.5 ounce copper and inner layers constructed with 1.0 ounce copper, simply create two separate “seed” command files identifying with these layer type and weight identifiers...

```
#  
#!copper_inner_0.5  
  
#  
#!copper_inner_1.0
```

Now that you have layer type and copper weight identifiers for various “seed” command files, DRC checks need to be defined with appropriate checking values for the copper weight listed.

Below is a simple Adiva Custom_Check command file running two circuit checks. This is also now a “seed” command file because it contains the 2-line layer type and copper weight identifier header along with a few comment markers for ease of reading...

```
#  
#!copper_inner_0.5  
#  
CircuitResolution 4  
CircuitInnerTraceToTrace 0.005  
CircuitInnerTraceToPad 0.005
```

Other DRC checking command files can be added to this to create as many checks as desired that are geared toward the copper weight defined in the layer type and copper weight identifier line.

The only thing this “seed” command file is missing is a way to assign the checks to a specific layer number for processing.

The Adiva Command Builder will automatically assign layer numbers into the output checking command file (collection of “seed” command files) but you have to add two lines in the correct syntax to activate a layer for checking and then deactivate a layer for checking. The keywords...

CircuitLayer
CircuitNoLayer

...are used with a # symbol to indicate to Adiva Command Builder where to substitute the layer number assigned to this “seed” command file in the final product. Below is what the “seed” command file on the previous page should look like now...

```
#  
#!copper_inner_0.5  
#  
CircuitResolution 4  
CircuitLayer #  
CircuitInnerTraceToTrace 0.005  
CircuitInnerTraceToPad 0.005  
CircuitNoLayer #
```

Once you understand the structure of a “seed” command file by layer type and copper weight, create multiple “seed” command files of the same structure for each layer type (inner, outer, plane) and for any copper weight you plan to use in layer construction. Expect many individual command files for the layer type and copper weight combinations.

Place these “seed” command files into the **%ADIVA_DATA%** directory as defined in a normal Adiva installation environment by default or in the **ENVIRONMENT_VARIABLE** setting defined by a custom installation.

It is also a good idea to identify these “seed” command files by name to clearly identify their contents. These file names are only descriptions and are not used by the Command Builder tool for layer assignment choice.

Example “seed” command files provided with Adiva Command Builder installation...

cu_outer_0.5.mac	cu_inner_0.5.mac	cu_plane_0.5.mac
cu_outer_1.5.mac	cu_inner_1.5.mac	cu_plane_1.5.mac
cu_outer_2.0.mac	cu_inner_2.0.mac	cu_plane_2.0.mac

Look closely at these “seed” command files as an example of structure. The following page displays two example “seed” command files with added checks...

Outer Layer 1.5 ounce copper

```
#  
#!copper_outer_1.5  
#  
PadStackResolution 4  
PadStackAnnRingLayer #  
PadStackAnnRingOuterClassP 0.004  
PadStackAnnRingOuterClassV 0.004  
PadStackAnnRingNoLayer #  
#### End PadStack ####  
CircuitResolution 4  
CircuitLayer #  
CircuitOuterTraceToTrace 0.004  
CircuitOuterTraceToPad 0.004  
CircuitOuterPadToPad 0.004  
CircuitOuterTraceToSMT 0.004  
CircuitNoLayer #  
#### End Circuit ####
```

Inner Layer 0.7 ounce copper

```
#  
#!copper_inner_0.7  
#  
PadStackResolution 4  
PadStackAnnRingLayer #  
PadStackAnnRingInnerClassP 0.002  
PadStackAnnRingInnerClassV 0.002  
PadStackAnnRingNoLayer #  
#### End PadStack ####  
CircuitResolution 4  
CircuitLayer #  
CircuitInnerTraceToTrace 0.003  
CircuitInnerTraceToPad 0.003  
CircuitNoLayer #  
#### End Circuit ####
```

Master DRC Checking Command Build Process

The Adiva Command Builder will create a master checking command file from a collection of pre-defined “seed” command files.

Command Builder will read an existing Adiva database and present to the user a listing of the layers in the design (1,2,3...), the layer type (Top, Bottom, Plane...) and the copper weight (0.5, 1.5...) as defined in Adiva’s layer description of the database chosen.

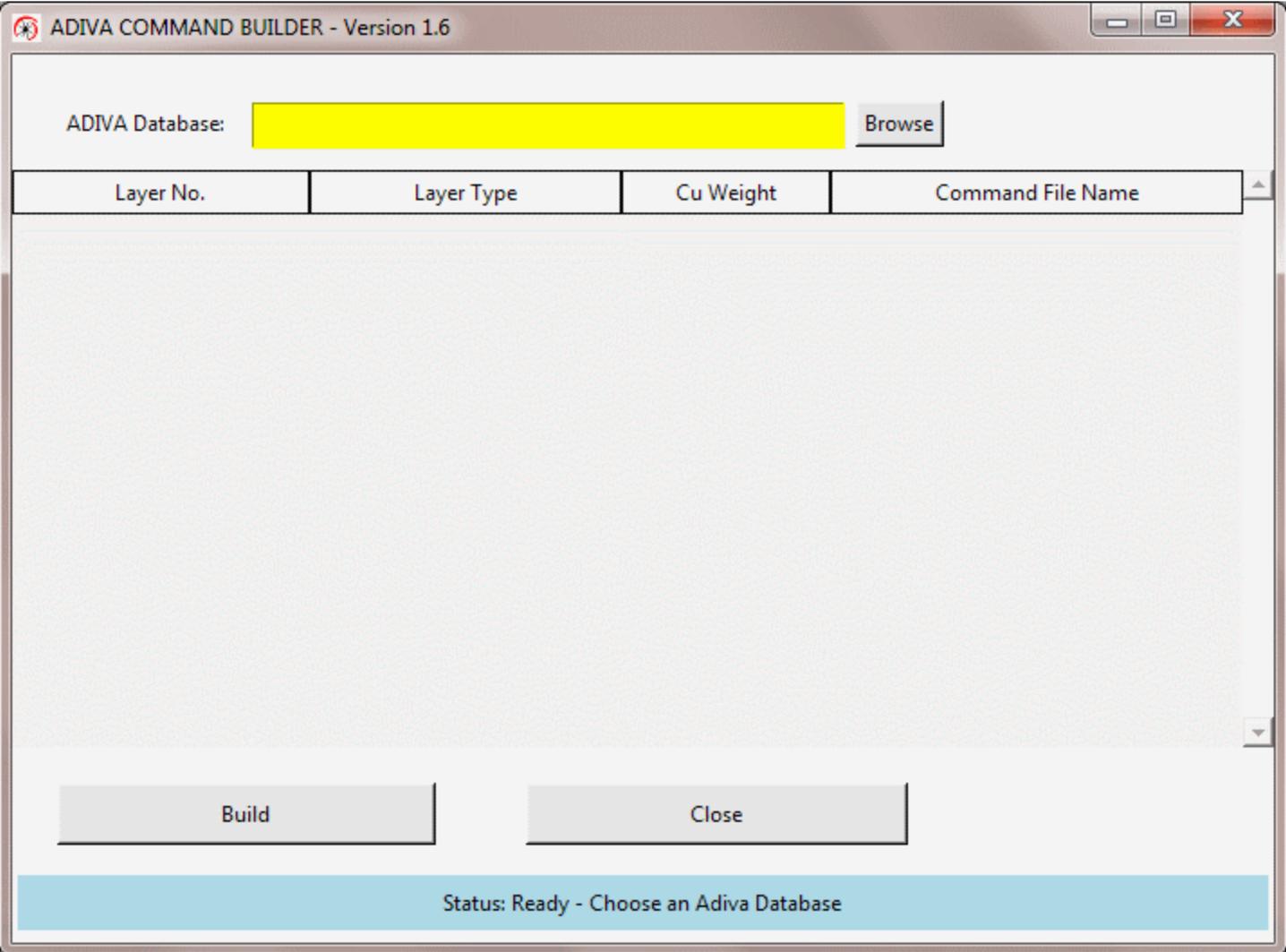
Command Builder will automatically match layer types and copper weights to “seed” command files by reading the **#!copper_** ... lines of the “seed” command files.

Once matched to each layer, Command Builder will display to the user the name of the primary chosen “seed” command files in a pull-down choice menu which also lists all of the other “seed” command files contained in the Adiva data directory. The user has the option to over-ride the Command Builder’s primary choice.

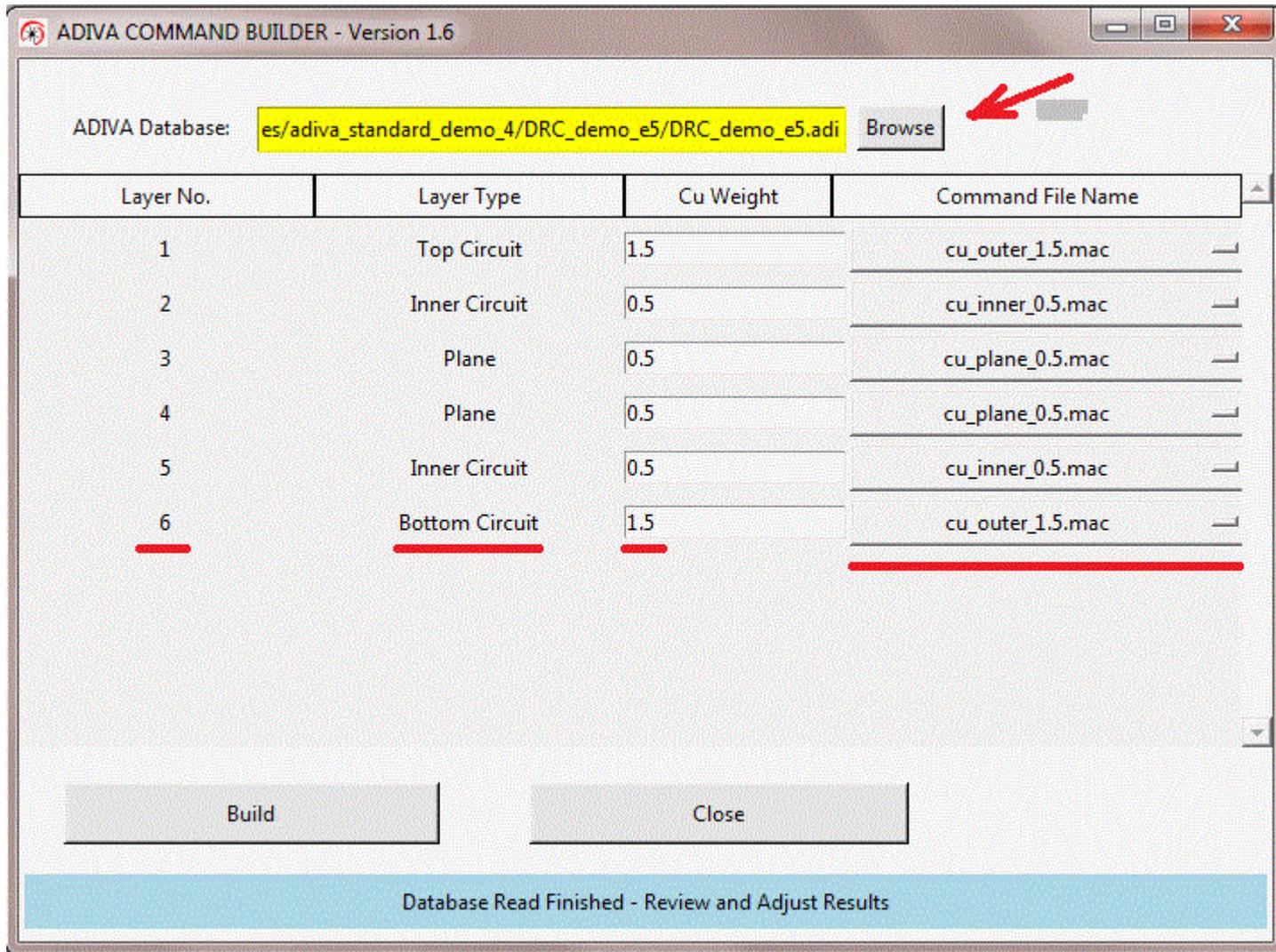
A user also has the option to redefine the copper weight value for any given layer and if the new value matches an existing “seed” command file, its name is now listed as the primary choice for the command file choice menu.

Choosing **Build** will create a master command file (a collection of “seed command files”) for use as a master DRC checking command file in Adiva.

Start Adiva Command Builder by double-clicking its Windows Desktop icon...

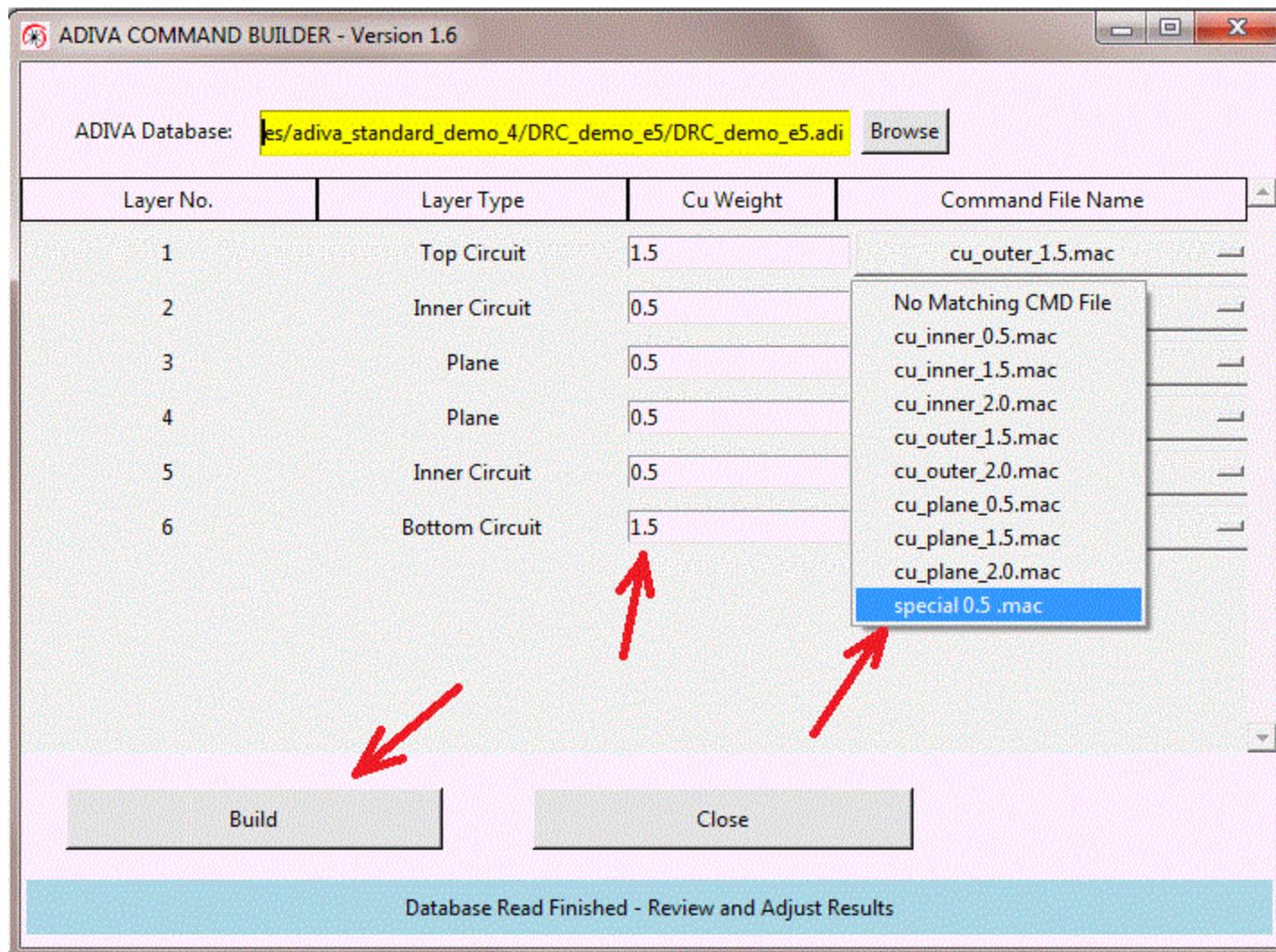


Click on the **Browse** button or enter the name of an existing Adiva database...



Once an Adiva database is selected, Command Builder will automatically list all layers of the design, list their types, display the copper weight and choose “seed” command files for review.

The copper weight value can be adjusted if desired and the chosen “seed” command file name can be adjusted as well.



Make whatever changes are required – if any – then select **Build** to merge the “seed” command files into a single master command file ready for Adiva DRC checking.

Given the 6-layer design in this example, on the left are three separate (very simple) “seed” command files that were selected. On the middle and right is the master command file created from the seeds...

```
#
#!copper_outer_1.5
#
CircuitResolution 4
CircuitLayer #
CircuitOuterTraceToTrace 0.004
CircuitOuterTraceToPad 0.004
CircuitNoLayer #
#### End Circuit ####
```

```
#
#!copper_inner_0.5
#
CircuitResolution 4
CircuitLayer #
CircuitInnerTraceToTrace 0.003
CircuitInnerTraceToPad 0.003
CircuitNoLayer #
#### End Circuit ####
```

```
#
#!copper_plane_0.5
#
CircuitResolution 4
CircuitLayer #
CircuitPlnCopperWeb 0.005 0
CircuitPlnCopperToNpth 0.012
CircuitNoLayer #
#### End Circuit ####
```

```
#
#!copper_outer_1.5
#
CircuitResolution 4
CircuitLayer 1
CircuitOuterTraceToTrace
0.004
CircuitOuterTraceToPad 0.004
CircuitNoLayer 1
#### End Circuit ####
#
#!copper_inner_0.5
#
CircuitResolution 4
CircuitLayer 2
CircuitInnerTraceToTrace 0.003
CircuitInnerTraceToPad 0.003
CircuitNoLayer 2
#### End Circuit ####
#
#!copper_plane_0.5
#
CircuitResolution 4
CircuitLayer 3
CircuitPlnCopperWeb 0.005 0
CircuitPlnCopperToNpth 0.012
CircuitNoLayer 3
#### End Circuit ####
```

```
#
#!copper_plane_0.5
#
CircuitResolution 4
CircuitLayer 4
CircuitPlnCopperWeb 0.005 0
CircuitPlnCopperToNpth 0.012
CircuitNoLayer 4
#### End Circuit ####
#
#!copper_inner_0.5
#
CircuitResolution 4
CircuitLayer 5
CircuitInnerTraceToTrace 0.003
CircuitInnerTraceToPad 0.003
CircuitNoLayer 5
#### End Circuit ####
#
#!copper_outer_1.5
#
CircuitResolution 4
CircuitLayer 6
CircuitOuterTraceToTrace
0.004
CircuitOuterTraceToPad 0.004
CircuitNoLayer 6
#### End Circuit ####
ViolSave DRC_demo_e5.vio
ShowViolChecklist
```

This created master command file (a blend of the “seed” command files) is named...

DRC_jobname_cu_weight.mac

It is now ready for processing by Adiva’s DRC checking tools.

Note - the layer numbers that “seed” command files were assigned to in the Command Builder GUI are automatically substituted for the layer activation / deactivation # symbol into the created master command file.

Also note - when Adiva DRC checking completes, Command Builder also added a function to the master command file saving Adiva found violations into a file and it automatically opens Adiva’s Violation Checklist for visual violation review in Adiva’s DRC tool.

Alternate Startup Methods

Adiva's Command Builder may also be started from command line. This provides the ability to script the tool for local installations. On the command line...

>**C:\python34\python.exe c:\adiva\bin_win\adiva_commandbuilder_vxx.pyw <jobname>**

...where **<jobname>** is an optional entry locating the Adiva database for Command Building. This must be a full path statement.

If used, the Adiva database is automatically loaded and processed. The user only needs to verify copper weights per layer and "seed" command file selection – then select **Build**. A master command file will be created.

Environment Variable Setting

Adiva's Command Builder uses a default environment variable defined by the main AdivaTools DRC product installation. This variable is called **ADIVA_DATA**.

If Command Builder is used in a standard Adiva DRC tool installation then simply place all "seed" command files into the path setting for **ADIVA_DATA** as defined in the users Windows environment setup typically "**C:\adiva\data**".

If Command Builder is used on a system that does not have a standard ADIVA installation, make sure an **ADIVA_DATA** variable is set with a user defined path within the users Windows environment so that Command Builder can find the "seed" command files.

If the user would like to use a different environment variable from **ADIVA_DATA**, this can be done by editing the Command Builder .pyw source code adjusting the line near the top of the source code...

ENVIRONMENT_VARIABLE = "ADIVA_DATA"

...to read something unique such as...

ENVIRONMENT_VARIABLE = "CORP_CONFIG"

Once this is completed, a Windows environment variable must be set called **CORP_CONFIG** with a path to the desired location. All "seed" command files need to be located in this location.

END

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