# DeckBuild

## Release Notes

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# 1: Version 3.26.2.R

## 1.1: Enhancements

- We have improved the generation of ATHENA etch commands from MASKVIEWS section files. We have replaced multiple etches with a single etch running across the whole sructure for a considerable efficiency improvement. Also, we have improved reliability by using ATHENA's etch left and etch right commands from within the structure when an etch falls exactly on the boundary of a structure.
- We have resolved a number of issues in `extract` commands with the `thickness` option. This should now work much more consistently, especially in complicated structure in which regions form loops.

# 2:Version 3.28.0.R

## 2.1: Enhancements

- Recursively defined `DEFINE` statements are now supported.
- pow (x, y) has been introduced as an alternative to x^y.
- Continuation lines in TONYPLOT commands are now recognized by DECKBUILD.
- Made improvements to the `DEPOSIT/EXPOSE/DEVELOP` family of commands.
- ATHENA commands containing the phrase `etch cobalt` now generate history files as advertised.

# 3:Version 3.26.6.R

## 3.1: New Features

The set of mathematical functions available for use in `EXTRACT` and `SET` statements has been brought into line with the functions provided by the C programming language. The functions supported are:

- `sin (x)` : sine of x
- `cos (x)` : cosine of x
- tan (x) : tangent of x
- `asin (x)` : angle whose sine is x
- `acos (x)` : angle whose cosine is x
- `atan (x)` : angle whose tangent is x
- `atan2 (y, x)` : angle whose tangent is y / x
- `sinh (x)` : hyperbolic sine of x
- `cosh (x)` : hyperbolic cosine of x
- `tanh (x)` : hyperbolic tangent of x
- `exp (x)` : e raised to the power of x, e is the base of natural logarithms
- `log (x)` : logarithm of x to the base e (natural logarithm of x)
- `log10 (x)` : logarithm of `x` to the base 10
- `pow (x, y)` : `x` raised to the power of y
- `sqrt (x)` : square root of x
- `ceil (x)` : smallest integer not less than x
- `floor (x)` : greatest integer not greater than x
- `abs (x)` : absolute value of x
- `ldexp (x, n)` : x multiplied by pow (2, n)
- `fmod (x, y)` : floating point remainder after dividing x by y

Angles for trigonometric functions are expressed in radians. The only remaining differences are that DECKBUILD uses `abs` where C has `fabs`. The `frexp` and `modf` functions in C are not supported because of their output arguments.

# 4:Version 3.26.3.R

## 4.1: Mathematical Operations

This version of DECKBUILD introduces a full range of mathematical functions for use in both `Extract` and `Set` statements. These functions are:

- `sin (x)` : sine of x, x expressed in radians
- `cos (x)` : cosine of x, x expressed in radians
- `tan (x)` : tangent of x, x expressed in radians
- `asin (x)` : angle (in radians) whose sine is x
- `acos (x)` : angle (in radians) whose cosine is x
- `atan (x)` : angle (in radians) whose tangent is x
- `sinh (x)` : hyperbolic sine of x
- `cosh (x)` : hyperbolic cosine of x
- `tanh (x)` : hyperbolic tangent of x
- `exp (x)` : e raised to the power x, where e is the base of natural logarithms
- `log (x)` : logarithm of x to the base e.
- `log10 (x)` : logarithm of x to the base 10.
- `pow (x, y)` : x raised to the power of y
- `sqrt (x)` : square root of x
- `ceil (x)` : smallest integer greater than or equal to x.
- `floor (x)` : largest integer less than or equal to x.
- `abs (x)` : absolute value of x
- `ldexp (x, n)` : x multiplied by pow (2, x)
- `modf (x, y)` : floating point remainder of x divided by y

# 5:Version 3.26.1.R

## 5.1: Major Changes

- The functionality provided by the DECKBUILD statements has been greatly enriched in the past year. Particularly, looping and conditional constructs (`"if blocks"`) are now provided. We give brief notes on each of the new statements. See Chapter 4 of the DECKBUILD USER'S MANUAL for full details.

### 5.1.1: LOOP, L.END and L.MODIFY

- These three commands together provide the standard looping functionality. As might expected, all the commands between a `LOOP` and `L.END` statement are executed repeatedly. The number of times is specified in the `STEPS` clause of the `LOOP` command. Loops can be nested within each other and within `IF` blocks.

  You can break out of a loop using the `BREAK` command or jump to the start of the next iteration with the `NEXT` command. `L.MODIFY` allows you to change the parameters controlling the execution of the loop.

### 5.1.2: STMT

- Enables you to define variables that change under the control of loops. You can increment or multiply variables by the same value on each pass. You can also assign variables in turn to each of a pre-defined set of values.

### 5.1.3: IF, ELSE and IF.END

- These three commands provide the standard if-block functionality familiar from all general-purpose computer languages. `IF` blocks may be nested within each other and within loops in any combination. As usual, an `ELSE` is associated with the most recent `IF` statement.

### 5.1.4: ASSIGN

- This provides a richer version of DECKBUILD provided by the existing `SET` statement. You can assign a numerical, logical or character value to a variable. The numerical values may be arbitrary arithmetical expressions incorporating any of the usual functions in the `<math.h>` header of the C programming language. Logical values may also be arbitrary boolean expressions concatenated by `AND`, `OR` or `NOT`. Character values may be incremented or decremented on each pass through a loop. This is useful if you want to write to a different output file on each pass.

### 5.1.5: DEFINE and UNDEFINE

- `DEFINE` replaces all subsequent occurrences of an identifier with a specified string. `UNDEFINE` cancels this action.

# 6:Version 3.21.1.R

## 6.1: New Features

You can now open a PDF popup containing the DECKBUILD USER'S MANUAL from the DeckBuild User Interface. VWF INTERACTIVE TOOLS contains a chapter about DECKBUILD. To open the PDF, select **Main Control→Manual**.

You can also open a PDF popup containing release notes for the current and several recent versions of DECKBUILD. To do this, select **Main Control→Release notes**.

## 6.2: Enhancements

This intermediate customer release fixes a bug in DECKBUILD's support for the VICTORY simulator.

DECKBUILD now behaves correctly when encountering a `"go victory"` command while the VICTORY simulator is already running. It sends a `"quit"` command to the first simulator before allowing the second to be launched, ensuring a smooth transition between the two VICTORY instances.

# 7:Version 3.20.0.R

## 7.1: New Features

- We have enhanced the 2D Material Region Boundary functionality in EXTRACT.

### Example 1

Here is an example of the existing syntax, which is still supported.

```
extract name="maxy" max.bound y.pos material="photoresist" x.val=5.2 y.val=0
```

Here, you obtain the maximum y value of the photoresist region that includes the point (5.2, 0.0).

### Example 2

We have implemented the following abbreviated form of this syntax.

```
extract name="maxy" max.bound y.pos material="photoresist"
```

Here, you obtain the maximum y value of all the points that fall inside **any** photoresist region.

You can use the name of any supported material in place of `"photoresist"` and you can obtain the minimum y bound by replacing `"max.bound"` with `"min.bound"`. Similarly, you can obtain the minimum and maximum x bounds by replacing `"y.pos"` with `"x.pos"` and using `"min.bound"` and `"max.bound"` respectively.

- We have implemented basic support for the VICTORY simulator in DECKBUILD.

## 7.2: Enhancements

- In all versions of DECKBUILD, you usually need to give an `Initialization` statement before any `Extract` command. Here is an example.

### Example 1

```
extract init inf="my_extract_input_file"
```

It has always been possible, however, for you to omit this statement in a device simulator deck, such as ATLAS. In this case, `Extract` searches for the most recently encountered device log file and uses that for its input. Here is an example of this behavior.

### Example 2

```
go atlas
.
.
.

log outf=atlas_log_file.log master
.
.
.

# No initialization statement necessary.
extract name="nvt" ...
.
.
.

quit
```

There was a bug in versions of DECKBUILD before this release. If you used variable substitution in the name of the device log file, `Extract` would fail with a syntax error. We have fixed the bug in this release. Here is an example of a deck that used to fail but now works.

### Example 3

```
go atlas
.
.
.

set atlas_log_file=42
log outf=$"atlas_log_file".log master
.
.
.


# No initialization statement necessary.
extract name="nvt" ...
.
.
.

quit
```

- If DECKBUILD can't obtain an SFLM license, a popup appears informing you that no application will be opened. Before, the message in the popup referred to MASKVIEWS and not DECKBUILD.
- DECKBUILD no longer confuses its `SET` command with UTMOST'S `SETUP` command, which was generating a false error message.

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