DARcorporation
Design • Analysis • Research

What's New in AAA?

Version 3.0 Service Release 2

December 2005

DARcorporation is proud to announce the release of **Advanced Aircraft Analysis (AAA), Version 3.02**. This service pack contains various enhancements and revisions to version 3.01 as well as repairs to unforeseen bugs. AAA 3.02 now has over 263,000 lines of code and over 4,119 variables.

Section 1 shows the enhancements and modifications made to AAA. Major enhancements include new modules and calculations. The second section contains bug fixes.

The AAA Manual describes the installation procedure and all modules. The manual is available in pdf format on the installation CD.

1. Enhancements and Modifications

A module-by-module overview of the differences between AAA 3.01 and AAA 3.02 is listed below.

1.1 Weight

No Changes

1.2 Aerodynamics

No Changes

1.3 Performance

No Changes

1.4 Geometry

No Changes

1.5 Propulsion

No Changes

1.6 Stability and Control

No Changes

1.7 Dynamics

No Changes

1.8 Loads

No Changes

1.9 Structures

No Changes

1.10 Cost

Cost Escalation Factor (CEF) is updated through October 2005.

1.11 General

1. Two separate Engine/nacelle location has been added to powerplant dialog window.
2. More GOTO buttons have been added to variables.
3. Help on variables has been updated.

2. Bug Fixes

This section lists bugs found in AAA 3.01 and earlier versions which are fixed in AAA 3.02.

2.1 Weight

1. AAA assumes that nacelles are wing mounted when the nose of the nacelles are 60% MGC in front of the wing, and fuselage mounted when the nose of the nacelles are 70% MGC behind the wing. This assumption does not always apply and an engine/nacelle location window has been added to the configuration module.
2. The fuel CG is not updated in the CG module and forward/aft CG table with moving wing locations when the recalculate all function is executed.
3. Floating Point Divide by Zero error generated by setting $W_{TO_{\min}}$ to zero in Weight Sizing> Take-off Weight is rectified.
4. Empty Weight CG table is not automatically updated with changes in the component CG. This is corrected.

2.2 Aerodynamics

1. Airplane pitching moment is not calculated properly if there are tabs. This is corrected in this release.
2. Critical Mach number now accounts for cambered airfoils.
3. Vertical Tail selection is possible now when there is no horizontal tail selected in Class II Drag Trendline.
4. Class II Drag Trendline now has an input for canardvator balance factor instead of elevator balance factor for canard configurations.

5. The Upwash gradient and upwash angle for a pusher configuration is calculated correctly in this release.
6. Ventral Fin wetted area and hence drag in Class II Drag is calculated correctly.
7. The selection of vertical tail in Class II Drag Trendline for a configuration with no horizontal tail is now possible.

2.3   Performance

No Changes

2.4   Geometry

1. There is a warning message (+90º to -90º) for the limits on the ventral fin dihedral angle.
2. Tab geometry is plotted when tabs are defined and then undefined. This is rectified.

2.5   Propulsion

No Changes

2.6   Stability and Control

1. Inboard and outboard flap stations are added in the input parameter list for the calculation of C_{m_α}, C_{D_α} and C_{L_α} which makes the output to be generated.
2. The hash marks are on the correct side of the trim triangle for canard configurations.
3. The canardvator deflection lines are plotted together and are now rectified.

2.7   Dynamics

No Changes

2.8   Loads

No Changes

2.9   Structures

No Changes

2.10 Cost

No Changes

2.11 General

AAA 3.02 can now be installed on Windows XP 64 Bit.