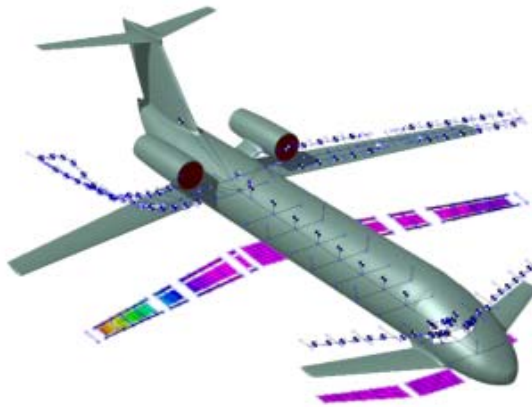# Additional Masses in Acbuilder & GUESS
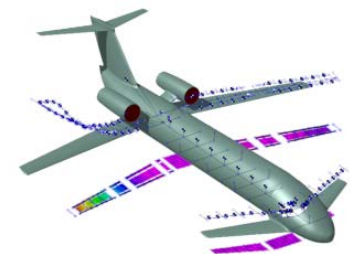

November 2019

Since NeoCASS 2.2.884

Introduction

It is now possible to add an arbitrary number of concentrated masses to the FEM model used by GUESS for the sizing process.

A step by step description of the procedure follows.

Text Editor

STEP 1

Generate a text file (.dat) with the list of concentrated masses you want to add to the model.

The required format is the following:

CG position(X Y Z) Mass AircraftComponentID

- CG coordinates are in AcBuilder global reference frame. X=0 at the aircraft nose, positive towards the rear, Y=0 in the symmetry plane, positive toward the right wing, Z=0 at rear fuselage section center, positive upwards. Expressed in meters
- Mass is expressed in Kg
- AircraftComponentID: 1-Fuselage, 2-Wing, 3-Htail, 4-Vtail, 5-Canard, 6-Tailbooms
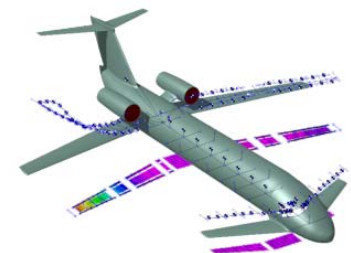
Text Editor

X	Y	Z	MASS	ID
16.184	−3.0077	−0.80405	16	2
18.695	−6.944	−0.80405	15	2
20.951	−10.589	−0.80405	14	2
23.055	−13.903	−0.80405	13	2
24.845	−16.63	−0.80405	12	2
16.184	3.0077	−0.80405	16	2
18.695	6.944	−0.80405	15	2
20.951	10.589	−0.80405	14	2
23.055	13.903	−0.80405	13	2
24.845	16.63	−0.80405	12	2
39.184	−1.7115	1.4961	5	3
41.092	−4.7539	1.8114	4	3
39.184	1.7115	1.4961	5	3
41.092	4.7539	1.8114	4	3

WING (ID 2), HTAIL (ID 3)

CG POSITION = X, Y, Z
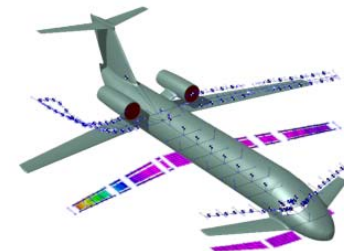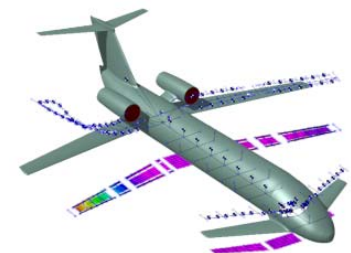
AcBuilder

STEP 2

With AcBuilder running, go to Matlab command line and write:

"global ac" and press Enter

Then write:

"ac.added_masses = '*Path\MassFileName.dat*' " and press Enter
Path\MassFileName.dat is the complete path of the file created earlier

From now on, complete all steps you normally perform inside AcBuilder with no differences (edit parameters, run Geometry and W&B modules, then Export XML).

GUESS

All needed information is already stored inside the XML file. Run GUESS as usual, no other steps are required.
At the end of the sizing process, concentrated masses can be found inside the main output file together with the rest of the structure. For each added mass there is a header explaining which row of the file it is referred to and its mass.

```
$-------2-------3-------4-------5-------6-------7-------8-------9-------10
$ Lumped masses: ADDITIONAL MASSES (row #14),4 Kg
$-------2-------3-------4-------5-------6-------7-------8-------9-------10
$ Uncomment cards below to substitute mass offset with RBE2 link.
$ Remember to comment CONM2 card with offset
$GRID    8013    0       41.092  4.7539  1.8114  0       0       0
$RBE2    17      4009    123456  8013
$CONM2   185     8013    0       4       0       0       0
         0.      0.      0.      0.      0.      0.
CONM2    185     4009    -1      4       41.092  4.7539  1.8114
         0.      0.      0.      0.      0.      0.
```
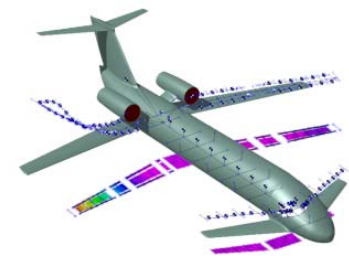
AcBuilder

DELETE ADDITIONAL MASSES FROM XML FILE

With AcBuilder running, go to Matlab command line and write:
"global ac" and press Enter

Then write:

"ac = rmfield(ac,{'added_masses' , 'AM'}) " and press Enter

From now on, complete all steps you normally perform inside AcBuilder with no differences (edit parameters, run Geometry and W&B modules, then Export XML). Additional masses will no longer be considered.