Workshop

to

Scale AFP modells

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***Note: This is not an official document by Ipacs,
but just a manual by an independent,
enthusiastic AFPD user.***

Purpose:
Scale an existing model to a different size and adjust all the necessary parameters.

It works for all the official models of aerofly professional (AFP) and all free models using the OBJ file format.
It does no longer work for the new TGO file format of aerofly professional Deluxe (AFPD). But models generated by this process will work in AFPD as well.

1. Scale the geometry file OBJ.
The first step scales the geometry of your model.

Use the tool zoomAFP of Rainer Stein for this operation.
You can download it from:
http://home.arcor.de/rainerstein/afp/afp.html
31.03.03 ZoomTool

Calculate the scale factor for your desired size:
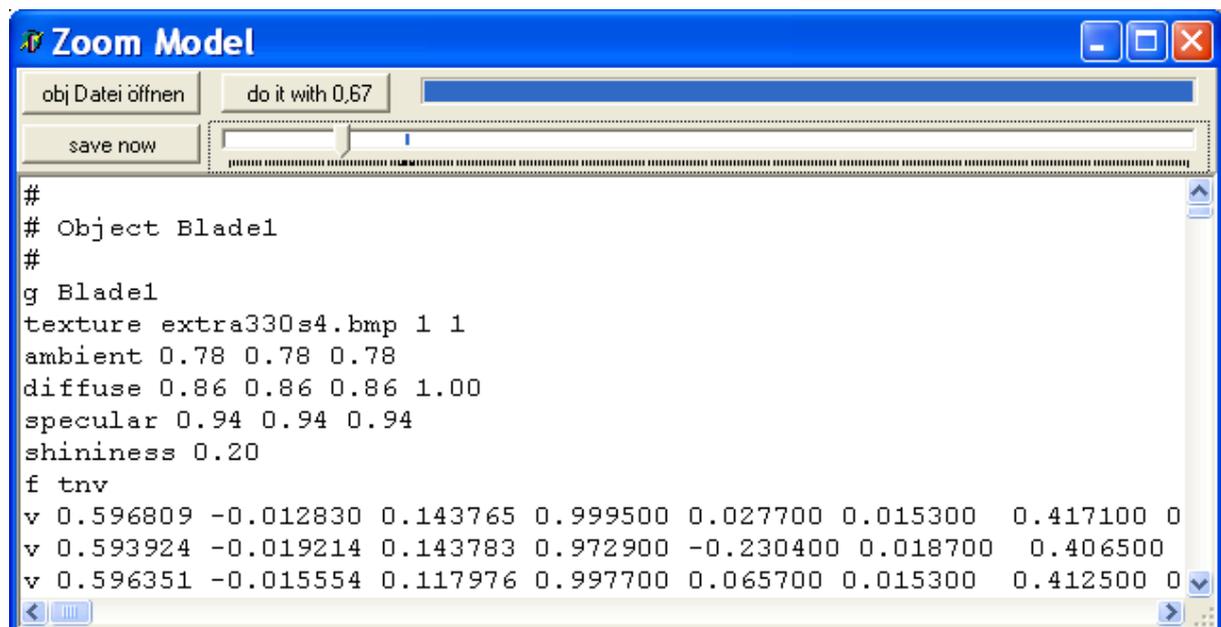desired wingspan 2m / actual wingspan 3m = 0.67
desired wingspan 79" / actual wingspan 118" = 0.67

double click onto zoomAFP_Models.exe
press button 'obj Datei öffnen' and select your OBJ file
adjust scale factor and press button 'do it with 0,67'
press button 'save now'

For all further operations, use WORDPAD or an equivalent editor.
Notepad and WORD are not appropriate, since they may add carriage return/line
feed commands.

2. Coordinate-Adjustment in the TMD file.
All joint coordinates and all pivot points of the objects have to be scaled as well.
Use the same scale factor (example 0.67) for calculation.

Find joint coordinates in the line R = ...

```
cd JointFuselageTailGear/
X   = tmvector4r(  1.0000,  0.0000,  0.0000, 0 )
Y   = tmvector4r(  0.0000,  1.0000,  0.0000, 0 )
Z   = tmvector4r(  0.0000,  0.0000,  1.0000, 0 )
R   = tmvector4r(  -0.9379,  0.0000,  -0.1379, 1 )
```

Find pivot points in the line MountingR = ...

```
cd TailGear/
MountingR = tmvector4f(  -0.9379,  0.0000,  -0.1379,  1.0000 )
```

Attention: Modify only the first 3 values:
first value =	fuselage axis,	positive to nose (0.9379m)
second value =	wing axis,	positive to left wing (0m)
third value =	heigth axis,	positive to top (-0.1379m to bottom)

3. Weight adjustment in the TMD file.
All parts should be modified to reflect the new size.
The weight is always set in the object section of the TMD.
Also set min/max values to appropriate figures.
Don't use a difference more than factor 10 between min and max.

```
cd LeftWing/
Mass = 0.75
RangeMassMax = 2.0
RangeMassMin = 0.2
```

4. Span adjustment of the wings.

The actual wingspan will be automatically calculated from geometry.
But you MUST make sure, your min/max range covers your actual span. Otherwise you will not be able to adjust this. Do this step for all wings and stabilizers.

In our example we have an desired span of 2m, which is a half span of 1m.

cd LeftWing/
RangeSpanMax = 1.5
RangeSpanMin = 0.5

5. Adjustment of the binding forces and dampers of objects.

Due to the modified pivot points and weights we have to set the new parameters.
This is a critical point, because without adjustment your model will not work properly.

cd JointFuselageLeftWing/
Kf = 100000
Df = 500
Ktx = 10000
Dtx = 100
Kty = 10000
Dty = 100
Ktz = 10000
Dtz = 100
MaxForce = 1000
MaxTorque = 1000
Rigid = 0
Essential = 1

For a first trial you can set all joints to rigid = 1.
Later you have to set at least the gear joints to rigid = 0.
Otherwise your model will dance on the ground.

To adjust the forces (K-values) and dampers (d-values), you may check the parameters of a model with similar size and weight. The forces and dampers depend upon the pivot points and the weight of the related objects. All of the related objects must have a weight greater than 0.

If parts of the model fall to the ground, the forces are not high enough.
If the model implodes and all parts wobble around, the forces are too high.

To adjust these parameters, you can use a feature of AFP/AFPD:
Start the sim in windows-mode, not full screen. Contemporarily open the TMD for editing. If you modify your values, save your TMD file. Then press Shift-F12 to reload the model to the sim. Therefore you don't have to leave and restart the sim.

You don't have to adjust the following joints, because they're always set to rigid = 1:

cd JointFuselageEngine/
cd JointLeftGearLeftWheel/
cd JointRightGearRightWheel/
cd JointTailGearTailWheel/
cd JointFrontGearFrontWheel/

Note 1:
Essential = 1 causes a restart of the model, if a part of it crashed.
Essential = 0 allows you to experiment with 1 wing or 1 gear left after a crash.

Note 2:
MaxForce = 1000
MaxTorque = 1000
If the K- and D-values are rather high, you will get a stiff connection of the parts. This is absolutely correct for many aircrafts. But in this case they will be extremely crash restistent and hardly break apart. Therefore you can give a separate crash factor with MaxForce and MaxTorque, which is generally lower than the K-forces.

MaxForce = 0
MaxTorque = 0
If these values are set to 0, the K-forces are also used for calculating the crash resistance.

6. Final editing with internal editor.
Use the internal model editor to adjust more values like profiles, angles of deflection, and all that stuff AFTER you finished TMD editing.

YOU'RE THROUGH!!!
Finally you end up with a new model for AFP/AFPD.
You could go on to modify the painting.
And you could go on to create a self extracting EXE file for installation.
See further workshops.

Enjoy!