D12 AEROTECH

A B9 Aerospace Expansion

Work In Progress –

D12 Aerotech is in Beta and will be updated frequently until Showcase Release. All builds released to the public are stable, but use at your own risk.

Always overwrite your install with what is included here, unless your Firespitter version is newer.

Introduction and Contents

What this is:

- A group of parts that **extends and fills some gaps in the original B9 Aerospace** pack, especially pertaining to more "kerbal sized" aircraft.
- A group of parts that can **replace or complement** some **original Squad parts** to match the unique B9 style.
- An **exercise in efficiency** for adding extending the KSP game play while working within memory and catalog space requirements.
- **A showcase for** what Snoj's **Firespitter.dll** makes possible, though not necessarily what was originally intended.
- **My** own **first experience in** the "dirty work" of **content creation**. In the video games industry I've served as producer, studio manager, creative director, and game designer…but never touching the technical or art side of things. This exercise has given me a lot of insight into what I've been missing.

What this is NOT:

- **An official patch or updated version of the B9 Aerospace pack** - The community has already addressed most issues with updating the B9 pack
- **A "standalone" work** - Though the license permits redistribution, the scope of this project was decidedly an expansion. This means it is still dependent on downloading the original B9 pack.
- **A Takeover or Continuation of B9 Aerospace** – Bac9 is still an active member of the KSP community and from his latest statements has no intention of turning over B9 to anyone.
- **An explicit endorsement from Bac9** – This work was produced under his generous license terms. He had no directive or input in its creation.

Credits and Appreciation

- **Snoj** – For the programming extensions in the Firespitter.dll that make some of the neat tricks possible.
- **Bac9-flcl** and **Taverius** – For the original B9 Aerospace models, textures, and concepts which made this possible, and for setting generous license terms so that others may build on their work.
- The good folks at Vought, Sikorsky, Hughes, McDonnel-Douglas, Grumman, Boeing, Sukhoi, and Makoyan design bureaus for the design inspiration.
- DeviantArt.com and MyBluePrints.com for nice diagrams and sketches from various contributors.

License

(insert pretty pictures later)
- B9 Meshes and Texturing Derivatives (as noted in the individual configurations) released under the B9_Aerospace parent license - BY-NC-SA. Unless otherwise noted, ALL textures in use by this pack are directly pulled from the parent B9 pack.
- Firespitter plugin provided under its own respective license included with this pack.
- Any original work in this pack is BY-NC-SA.

Dependencies

B9 Aerospace (*dependent*) – This is the original KSP parts pack which all designs are based on and textures recycled from. This is a requirement to use this pack. Any plugins included with B9 Aerospace are also a requirement.

You are free to arrange and/or delete the .cfg's and textures yourself to narrow down your catalog clutter, but that is not within the scope of this expansion.

Module Manager (*dependent*) – Necessary for community fixes for the B9 pack which are included as a courtesy.

Firespitter Module (*dependent*) – The latest Firespitter.dll plugin has been included with this pack and is essential for functionality of about half the parts.

Installing the full version of Firespitter gives some additional sounds where there are placeholders in the beta version of this pack.

Secondary – Not necessary for basic functioning, but some parts will have additional function if any of the following are installed.

- **Romfarer** – Adds additional functionality to weapon-like objects included in this pack.
- **FAR** – Most parts are FAR friendly right out of the box except where noted. (90% IMPLEMENTED).
- **ID Skillful** – Parts in this pack are ID Skillful combat compatible right out of the box. (NOT YET IMPLEMENTED).

Recommended or Future Compatible – *Future editions of this pack may use or enhance your experience with the following add-ons and/or these packs complement what is made here:*

- SpacePlane Plus (Porkworks)
- KSP Interstellar
- MechJeb
- ScanSat Terrain Mapping
- RemoteTech
- Kethane
- KAX
- Procedural Wings
- B9 Passenger Compartments (K3 Chris)
- Editor Extensions

Squad Part Knockout

Specific parts in this pack were designed with identical or near identical parameters of Squad stock parts. By installing this expansion, there are a number of parts in your Squad folder you can eliminate in order to save RAM loads and reduce your parts catalog clogging.

By defa̲...You are encourа̲...quad parts list.

Follow

1.
2.
3. ....cfg files
4.
5. ....the side

Note: .... or .craft files th...weak the craft in ....load.

Note: The order of these parts in the catalog will change. It will take some time at first to find them again.

Knockout not yet implemented. You may comb the configs in the Expansions/D12Wingtech folder and remove any X's at the end of some part names. You can then delete the corresponding part folder in the Squad/Parts folders.

After installing the Knockout configs, you may safely delete the following from your GameData/Squad/Parts folder:

1. The entire ..Parts/Aero folder
2. ../Utilities/
   1. Intakes (except Airscoop)
   2. Other
   3. Else
3. ../Command/
   1. Mk1Cockpit
   2. Mk2Cockpit
4. ../Structural/
   1. StructuralWing
5. ../FuelTanks
   1. Mk2adapter
   2. Mk2fuselage
   3. FuelTankShort

Mesh, Texture, and Fuel Switching

- Most parts in this pack have multiple options to pick from when you place a part from the catalog.

- Each option has identical stats to the original, though the appearance can radically differ.

- To change a part's appearance, right-click on it in the VAB/SPH and click the appropriate button to toggle through the options.

- Some parts have multiple options for different aspects of the object (such as base and winglet on canards).

- Some parts have both texture and mesh switching options. Texture switching only changes the texture on meshes that use that texture, so not all meshes toggled will change color.

Note: No matter how superstitious you are, changing the color to red does not make things go faster or change the stats in any way.

Note: The collision for the part goes by the first mesh placed in most cases. This can lead to strange things happening when you try to surface attach on an alternative design. This is normal and won't do anything bad to your game. It also means you might do some clipping on parts in game play until the real collider is hit. In most cases, this is barely noticeable and in no case will it effect your game play in any meaningful way.

Note: Yes, it looks like garbage in the catalog and it makes it sometimes difficult to figure out what you need, but you'll get the hang of it and the catalog garbage issue may be fixed in future Firespitter.

Wings and Control Surfaces

This pack contains a large variety of canards, wings, winglets, and control surfaces to play with. Each category has their own "part" in the catalog, and you can mesh switch between the types. For the most part, the different shapes allow you to do things that Pwings add-on does not.

You will wish to tweak your control surface for its specific function. Do this in the VAB/SPH by right-clicking (this will set the controls for mirrored pairs) or during flight (just sets it for that side). For best results:

- Rudders (vertical controls) should be set for Yaw only, all others should be toggled off.
- Wing ailerons should be set for Roll and Aileron.
- Tail elevators should just be set for Elevator, all others should be off.
- Feel free to experiment and ignore these rules for non-standard designs.

If the part does not contain an active control surface (such as any static wing or fin), it can be reversed (flipped forward or upside down) and will still function properly.

If the part contains a control surface (i.e. canard, winglet, or trailing edge aileron), it will not function properly upside down. More advanced users may still wish to do this for whatever reason.

Some larger wings have attach nodes for whatever purpose you devise.

Rectangular wings are made so their lift is centered in the middle of the wing instead of the edge. This allows you to center mount them singly (bi-plane or some tail configurations).

Wings

Yeah baby!

There are 2 Swing Wing designs that are included in this pack for the sake of brevity.

Variable geometry adds additional lift surface to the wing, giving them more lift but also more drag when triggered. This is good for take-off, landing, and hauling heavy pylon loads.

Please note the following when placing:

- You cannot manually toggle them on or off by right-clicking in game. You can change the .cfg for auto-deployment, but by default:
- You **MUST** set up an action group for them. Set this up **AFTER** you place both wings and reset them any time you move the wings around.
- Likewise, on the F-14 wings, you must set an action group to toggle flaps up or down.
- They work just fine forwards or backwards. If you install them inverted, its best to set all control tweaks to zero.
- The F-14 style swing wings have flaps and ailerons built-in. The "roll" setting must be negative, while all other settings should be positive. By default they are at their normalized settings. Tweaking for additional "flap" will mean the ailerons also rotate with the flap toggle.
    - Also note that with the F-14 wings, when the wing swings, it moves the Center of Lift forward a bit. Improper placement can lead to unintentional aerobatics.
- The X-02 style swing wings have no additional control surfaces. Setting a flap group for these does nothing (FS bug). These have a nice surface so you can attach your own ailerons as desired.
- Swing wings are **NOT F.A.R. COMPATIBLE**. You can place them, but they have no additional function other than a normal wing and you will not be able to set an action group for them.

Folding Wings

Origami for the Masses

There are a set of folding wings (with 3 variants) included in this pack. Note the following:

- They use stock canard logic – this means:
  - You cannot place them inverted (backwards) or the lift changes downwards. *(Ed. Note: I'll implement a forward swept variant by request.)*
  - They ARE **F.A.R. compatible**.
  - They do angle a bit (5 degrees max) with elevation to give them a little extra lift factor. You can turn this off.
- They use FSAnimate logic – this means:
  - They can be toggled in or out of the VAB/SPH or set to an action group.
  - They can fly (somewhat) when folded. Folding them in flight does change their aerodynamics in some small way and can mess up your flight pattern, though I'm not sure how.
  - Attaching anything to the moving part of the wing will not lift it when the wing folds up, it will hang in mid-air. Attach things to the inner (static) part of the wing.

Because of incompatibility between Fswing module and FAR, there are some things that can't be done.   This includes logical aerodynamics changes between states and partial folding states having any meaning. I decided to leave these FAR friendly, non-FAR users still have their swing wings. I may revisit this in the future.

Modular Fuels and You

Modular Fuels plugin is optional. Everything still has good functionality out of the box.

Modular Fuels allows you to change the contents of your fuel tanks in any mix up to a defined max value. This means you can:

- Freely define any fuel tank (or other parts) as Liquid Fuel or Liquid Fuel/Oxidizer mix, or any other fuels you may use.
- Reduce the max amount of fuel in a tank for weight balancing.

To do so:

1. Place your fuel tank or other part.
2. Go into action group settings. LEFT click on the part.
3. Define the fuel amounts manually or click on the fuel mix buttons based on the engines you also have installed.
4. Click update and then save the craft.
5. If you move around any parts after doing this, be sure to check them again before launching – sometimes the fuel info is lost.

Drop Tanks

or, How I Learned to Stop Worrying and Love the External Fuel Sources

There are large and small drop tanks included with this pack (with variants).

- They can be attached with any pylons or holders (included with this, B9, or Firespitter pack) by the attach node. They can also be surface attached, though they then can't be dropped unless attached to a standard decoupler.
- To have them fuel your craft, you must run a fuel hose from either the tank or the pylon to the core of the craft. (ed. Note: I haven't figured out a way around this after a lot of trying.)
- They have their own internal docking node logic. Use an action group or right-click in flight to drop them. No staging so no accidents with the space bar.
- They do hit hard on a direct hit with anything, but if you really want to blow some *kerbal* up, try bombs instead.
- Use the SPH/VAB right-click menu to toggle through various fuel loads and designs.

Rotors

Floaties

A single float piece has been provided. You can mesh-switch as you want between the conical end piece and middle piece of the float. By default, they come with strength 12, but you can adjust them as you see fit.

To take off in the water, try to adjust the floatation so your aircraft is nose up around 5 to 15 degrees, otherwise you'll be stuck gliding along.

When landing, pull out every trick you know to try to get the drop to under 3m/s and forward speed under 40m/s. Gentle is good. The floats can take the hit, but your other aircraft parts might not survive the impact.

Also in this pack is a special pylon piece and short landing gear piece that are both specially reinforced for water landings.

New Intakes

New Cockpits

- There are 8 new cockpits with this set.
- The "Escape Pod" command seat has a basic issue where you will need to zoom in REALLY close to get your kerbal back out. It will also eject your kerbal safely when it crashes (generally at the smallest provocation).

Odds and Ends

- **Mk2 Fuselage Lateral Mount** – Allows you to mount Mk2 parts side-by-side instead of belly attached.
- **S2 Fuselage Lateral Mount** – Allows you to mount an S2 fuselage side-by-side instead of on its belly.
- **B52/58 Engine –** Made from resizes.
- **Pylon Resizes (x3)** – A shorter one for smaller craft and a chunky one (Sea Stallion style) for larger loads have been provided. The third is a long one, specially reinforced for mounting floaties.
- **Squad Parts Replacements**
  - Adapters
  - Nosecones/Adapters (several varieties to switch)
  - Tails (a second stack node has been added to the tip)
  - Mk2 Fuselage and Adapter Replacement

Weaponry

- To see the test missile set, you must install any of Romfarer's various lazor mods. The best one is his missile mod, as that contains the missile cam elements.