

AVSIM Commercial Aircraft Review

Beechcraft 60 Duke



Product Information

Publishers: [Real Air Simulations](#)

Description: Twin Piston Add-on Aircraft.

Download Size:
78.3 MB

Format:
Download

Simulation Type:
FSX

Reviewed by: [Mark Kolo](#) AVSIM Staff Reviewer - August 13, 2009

Introduction

The Beechcraft Duke is a light pressurized piston twin built between 1968 and 1982. The aircraft has retractable landing gear and turbocharged engines and some of the later models have winglets.

The Duke was originally conceived to fill the gap between the Baron and the Queen Air in the early to mid 1960s with the

prototype's first flight being in December of 1966. The type was granted an FAA type certificate in February of 1968 with the first aircraft being delivered in July. The upgraded A model (A60) was introduced in 1970 with a better pressurized cabin, improvements to the engines and better elevators/horizontal stabilizers. The aircraft was further upgraded to B standard (B60, the model that RealAir produced for this review) in 1974 with even more engine improvements and a new cabin layout.

The Duke is reputed to be a great performing aircraft, but its complicated systems and technologies demanded high maintenance costs, which hurt the sales of the aircraft. Production was stopped in 1982 after a run of nearly 600 airframes. Many Dukes are still flying to this day, and are well liked by their owners despite high costs. Duke owners love the aircraft for its combination of good looks, high ceiling (lower fuel burn), high cruise speed, relatively long range, and pressurized comfort. According to Controller.com, a 1982 Duke in great condition with recent overhauls on the engines will go for nearly \$500,000, but an older one with some time on the engines will cost under \$200,000. They represent a great value, and successfully fill a small niche market for owners stepping up or down to/from larger turbine powered aircraft.

Installation and Documentation

Installation of the Duke was extremely easy. After purchase, customers are given a unique activation code which is entered into the installer after logging into or creating a new RealAir account. The installer automatically verifies the code and proceeds to install the aircraft into the FSX directory.

As with all RealAir aircraft, the Duke not only comes with thorough documentation, but also a configuration panel. The panel contains shortcuts to the documentation (Flying Guide, Pilot's Operating Handbook [Checklists and Charts], Autopilot manual [KFC-225], and to the RealAir website). The Configuration Panel also contains options that are reflected in the simulator such as the ground steering mode, avionics on/off, cold and dark/ready to taxi, as well as the strength/severity of the RealView stall buffeting.

There is also an options page for using the Reality XP Garmin GNS 530 or 430 in lieu of the standard FSX Garmin 500 unit. This page also has the options for how pilots interact with dials in the VC, by either a click and drag method or by left/right clicking to change values. The final page contains a utility that automatically checks for updates, and can download and install them for you once you OK it.

The documents are typical for RealAir, and that is to say extensive and thorough. The Flying Guide contains information regarding the development and simulation/settings end of operations as well as addressing the few small issues (Caused by FSX rather than the developers) that the Duke does have. It also contains a brief history of the aircraft, and extensive analysis of all the features of the aircraft. In addition, the Flying Guide gives a brief lesson on single engine operations which would be very helpful to anyone new to flying twins with one engine stopped.

The POH contains a full checklist and a set of charts for things such as takeoff speeds, stall speeds, cruise speeds, and fuel burn. The final piece of documentation is the manual for the KFC-225 autopilot. While short, it has diagrams and explanations for all the functions of the unit.

First Impression

I was very impressed with the Duke from the moment I first saw her on the

Test System
Dell XPS 400 with Intel Pentium D Processor and Windows XP Radeon X600 256MB Flight Simulator X (SP2 and Acceleration) CH Products Yoke and Pedals
Flying Time: 32 hours

RealAir website. I was even more impressed when I first loaded her into FSX, despite the fact that my settings were not optimum at the time. This model is very cool looking, and not to take away from RealAir, but that has as much to do with the Beechcraft designers as it does the modelers.

External Model

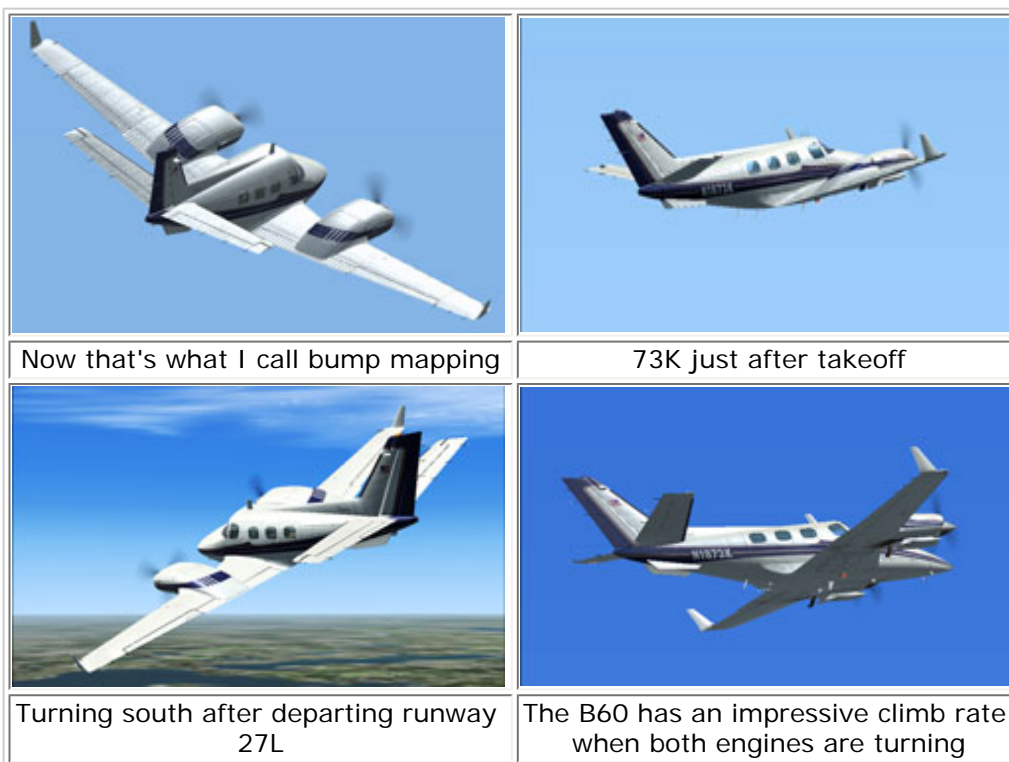
Having reviewed a RealAir product in the past, I was already aware of the high quality, and frame rate friendly models. The Duke is no different, with lines faithful to the real aircraft down to the 15 static dischargers on the trailing edges of the wings and tail assemblies. The unique dorsal fin on the top of the fuselage in front of the rudder/vertical stabilizer is well done, as is the blade type antennae mounted on top of the cockpit. The highly swept rudder and the horizontal stabilizers are very accurate down to the black de-icing boots on the leading edges.

No polygons have been spared on the cowlings or engines, as all the vents are three dimensional. The NACA type scoops on the sides of the cowlings are particularly well done, as are the air intakes on the front of the engines. Most aircraft that I have seen have the engines textured on a 2D feature behind the propellers, but not the Duke!

The landing gear, flaps and control surfaces are also very detailed and lend to the overall high quality of the model. The B60 is a metal skinned aircraft that is held together by rivets. I was simply blown away by my first look out the left side window at the wing, as the bump mapping is absolutely flawless, and the variances in reflections gave a perfect view of the structure lying beneath the wing skins.



My first glimpse of the Duke as I walked out to her for the first test flight



The animations and moving parts of the exterior model are also very high quality, and seem to be accurate to the real aircraft. Just like on the SF-260 (and the real Duke), the flight control surfaces are not directly attached to the yoke and pedals, rather they are moved by smaller control surfaces that in turn move the larger ones that fly the aircraft. Seeing the trim tabs move in the opposite direction of the surfaces is a touch of realism that adds further to the overall quality of the model.

The usual animations are present (door opening, gear, flaps, and control surfaces) as well as cowl flaps and feathering props. The door animation is an example of where RealAir has gone the extra mile, as the door cannot be fully opened in the air. The door can only be opened a little bit as long as the speed is below 40 or so knots, with the door back out to fully open at around 30 knots. It just takes a quick keyboard shortcut to get the door closed and latched again. Also tied in to the door position is the pressurization. A rapid depressurization follows any opening of a door in flight, so you had better be ready for an emergency descent if you accidentally bump "Shift-E".

Internal Model and VC

Stepping inside the Duke (courtesy of the beautifully modeled air stair contained in the door behind the left wing) revealed an interior that is faithful to the original. The four passenger seats (where you virtual pilots shouldn't ever be in flight!) are very detailed, as is the animated fold out table on the right side of the cabin. On one of my longer flights, I engaged the autopilot and used the supplied cabin views (one looks forward towards the cockpit from the right rear seat and the other looks out the rear window) to enjoy the flight from a passenger's perspective for a few minutes. Even with all the detail of the cabin, I'm sure everyone wants to hear about the cockpit. This is Flight Simulator after all, not passenger simulator.

The cockpit of the Duke is one of the finest and most realistic renditions that I have ever seen in Flight Simulator. As most Dukes are in the hands of private owners, they generally have relatively low hours and are well cared for. This is reflected in the texturing of the VC, as there are very few signs of wear and tear that you may expect to see on an aircraft approaching its 30th birthday.

Along those lines, I feel it is important to discuss the avionics fitted to this model of the Duke. Being in private hands and as a fast pressurized twin, the majority of Dukes are equipped with a more modern radio stack as well as some sort of GPS (most commonly a combination of Garmin 400/500 series units). In this case, RealAir has equipped the panel with a more modern Bendix-King radio stack, combined with the King KFC-255 autopilot. The KFC-255 is designed for single pilot operations and is a three axis autopilot (lateral, vertical, and yaw). To the best of my knowledge the included autopilot is 100% faithful to the original. RealAir offers an interesting option to owners of the RealityXP Garmin 430/530 GPS systems.





The VC can use either the default FSX Garmin 500 (With custom 3D modeling and enhanced click and drag operations) or a few different combinations of the RealityXP system. I do not own the RealityXP GPS systems, but from screenshots that I have seen, the integration is seamless. Due to the higher level of complexity of the Duke compared to earlier RealAir releases, frame rates are lower. In an effort to help combat the loss of performance as well as being able to emulate a B60 that may not have been upgraded yet, the GPS can be turned on and off by a switch added to the left side of the frame.

As with most GA aircraft for FSX, there are many switches often for lighting and de-icing/pitot heat, which cannot be used without moving the yoke. RealAir has included the ability to hide the yokes in order to allow pilots to manipulate those switches without changing the attitude of the aircraft. Since there are many areas of the panel, RealAir has included a number of pre-zoomed views that focus on critical or more commonly used instruments instead of popup 2D panels. These can be accessed either by switching the view in the dropdown menu, using your shortcut key for switching views in the category, or by clicking on the panel itself near the controls you want to access. In my time flying the Duke, I came to love its layout and functionality. Everything is right were I would expect it to be and the B60 grew on me, and will always have a spot near the front of my virtual hangar for those medium range flights around the Midwest!

Textures

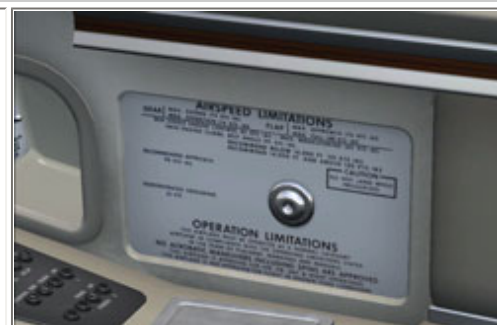
The advances in development and technology on the Duke are carried over to the textures. RealAir uses high resolution 32 bit images for the texturing of the Duke, but unlike other high resolution texture applications, the Duke suffers minimal frame rate hits as a result of the higher resolution. I really enjoy the high res textures on the inside and out of the aircraft as it adds an amount of realism that helps tie the package together. Due to the higher resolution, there is an amount of texture lag when changing from interior to exterior views, but when you can read the limitations placard clearly from across the cockpit, it is all worth the wait!



A passenger's eye view at FL280, high above the Michigan countryside



The awesome bump-mapping on the wing is noticeable with the stressed skin look as well as the panel and seams on the cowlings



I love the high resolutions textures!

In keeping with the theme of the B60 being a well kept private aircraft, the Duke's exterior has a minimum of weathering, though it is very realistic. Prime examples are the paint chips on the nose, as well as small fuel and oil stains under the cowlings and near the fuel fill caps. I feel that the textures placed over the beautiful 3D models are nearly perfect and are an excellent compliment to the package as a whole.

Panel

The RealAir Duke contains no 2D panel. I agree with many developers here that the 2D panel is not really necessary any more thanks to the incredible detail, realism and clarity that virtual cockpits provide. For information concerning the panel, see the VC section of the review.



The environmental controls on the B60, one of many pre-zoomed sub panels available in the virtual cockpit



The yokes are hidden for easy access to the switches on the lower main panel



The virtual cabin

Sounds

The sound package for the Duke is absolutely stunning, with full conical and stereo (dual channel) sounds. As I moved around the aircraft in spot view (or from tower view as I brought her in close for some screenshots) I could tell that this was one of the most advanced that I had ever experienced in the simulator as the sound changed from a soft white noise off in the distance up to the roar of the turbocharged engines as I flew by. The right and left engine's sounds are

recorded on separate channels, as are all of the other miscellaneous sounds (gear and flap actuators, ambient sounds, etc) and mixed together based on the location in relation to the aircraft.

When inspecting the cabin and moving about the cockpit, the sounds varied greatly depending on where I was. When sitting in the cockpit, the engine sounds were much louder due to the closer proximity to not only the engines, but the propellers as well. As I moved to the back row of seats, the engine noise diminished by a large amount however the sounds of the actuators for the flaps and gear are much louder due to the location. If you have any more questions about the Duke, I'd suggest watching some of the flight videos on YouTube or visiting RealAir's website.

Airfile

RealAir Simulations is best known for their highly accurate flight dynamics programming, and the Duke is no exception. As with all RealAir releases, the Duke features not only an accurate standard flight model, but also has accurate stalls and spins. The Duke is not approved for these maneuvers, but if you are not careful about keeping your speed up on climb-out or in the pattern she will start buffeting and eventually stall out. At this point, increase power, nose down, and keep the wings level or a spin may develop. Unlike the SF-260 that I have previously reviewed, the Duke's spins are difficult to get out of once it is fully developed.

I found the Duke to have effective flight controls with plenty of authority to keep the aircraft flying well, though I admit that my first few landings weren't pretty. Thanks to twin turbocharged engines, the Duke has very respectable climb performance after takeoff and can keep relatively high climb rates all the way up to FL280. My biggest issue when flying the Duke was getting used to the higher landing speed (I have been flying Cessnas and Extras a lot lately) and the different sight picture from the cockpit. With the short wheelbase, it is important to keep the CG within limits, as it is all too easy to end up resting on the ventral fin.

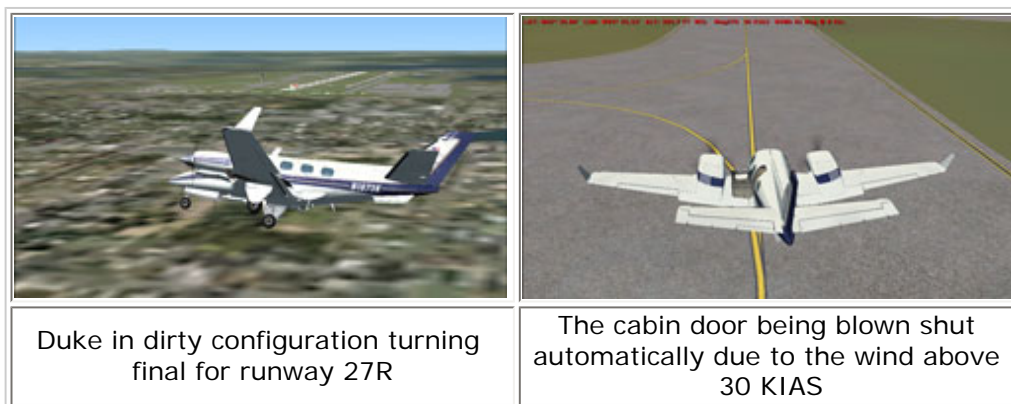
Just like the real aircraft, the RealAir B60 is capable of reaching relatively high altitudes for a piston engine aircraft. Due to the thinner air, it is recommended that the autopilot is used whenever flying over 8000 feet, but I did hand fly the Duke at high altitudes a few times during testing and found it to still be very controllable, though larger control inputs are required to keep her on the desired course.

Being a twin engine aircraft, the B60 has a few procedures and restrictions that will be unfamiliar to all you virtual Cessna pilots out there. Unlike a single, the Duke is not allowed to be slipped to bleed off speed for landing due to the blockage of airflow to the engine on one side of the aircraft. Any slipping is restricted to 30 seconds. The challenge of flying a twin on a single engine is one of the biggest turn-offs to getting a multi engine rating for most private pilots, and my experience in the Duke has given me a greater respect for multi certified pilots.

Unlike some twins, the Duke does not have counter-rotating propellers, so due to the effects of P-Factor and Torque, a left engine failure is more serious than a right engine failure. Once one of the engines quits, the pilot needs to immediately secure the engine (if the failure was not as a result of intentionally pulling the power back for the sake of training) by cutting off fuel and feathering the prop. While this is being performed, it is very important to counter the yaw and roll caused by the asymmetrical thrust with the rudder (apply pressure to the rudder pedal on the side of the working engine). The aircraft will now be flying sideways, and bleeding off speed rather quickly, so increasing power on the remaining engine is definitely a good idea! Keep the ball centered, and if climbing is required, the Duke is capable of 350 feet per minute of climb even on a single engine provided your speed is on the "Best single engine rate of climb" bug on the airspeed indicator (the blue line). I could go on for ages about flying on a single engine, but there are some even cooler aspects of the flight model that I haven't covered yet.

In my extremely limited real world flight experience, I found the most unrealistic part of FS to be taxiing. It is very

difficult to describe the differences, but the best way I can describe it is that the aircraft responds much slower in reality and differential brakes play a much bigger role than in the simulator. In an effort to increase realism of taxiing, RealAir has included an option to use only differential brakes for taxiing. Instead of having the nose wheel connected directly to the rudder pedals, many aircraft (the B60 among them) use a passive steering nose wheel that turns when the differential brakes direct the nose wheel by changing the drag on the main gear. In the case of real world operations, it is possible to lead the turn by increasing power on the engine on the outside of the turn to assist the brakes in steering the aircraft. As I don't have a multi engine throttle quadrant yet, I had to rely solely on the toe brakes of my pedals, which took a bit of getting used to after over 10 years of using the standard FS system of taxiing. After I got used to it however, I found the RealAir method to be much more realistic, though FS is still clearly lacking in the ground handling department.



Duke in dirty configuration turning final for runway 27R

The cabin door being blown shut automatically due to the wind above 30 KIAS

After the "Miracle on the Hudson", I'm sure just about every virtual pilot has tried a water landing with the default A321 (or whatever you may have that is the closest to the US Airways jet). I'm sure you found that one of two things happened, either an immediate termination with the green bar reading "SPLASH", or a glitch climb to a "safe" altitude and airspeed. RealAir has taken emergency landing in FSX to a whole new level with the Duke, as when crash detection is off, it is possible to make a safe and realistic belly landing either on land, or in a body of water. Unfortunately, undercarriage failure is not an option in FS, but by leaving the gear up you can simulate a belly landing. When landing on a runway, you will see and hear sparks, dust, smoke, a groove in the runway behind the plane and grinding noises as the aircraft comes to an abrupt and shuddering halt. Due to a simulator limitation, for this effect to be 100% realistic, you must feather the props prior to the landing otherwise you will have spinning propellers with an aircraft resting on its belly on the runway. When it comes to water landings, a Captain Sully type landing is the best way to successfully ditch, by skimming the surface and touching down tail first. The Duke will glide to a rest and float on the surface.

Summary / Closing Remarks

Thanks to a combination of a great 3D model, high quality textures, a beautiful virtual cockpit, incredible sounds, and an extremely realistic airfile, I found that the RealAir Simulations Duke is one of the finest add-ons that I have ever had the pleasure of flying. With all the attention paid to the accuracy of the flight model, the Duke is a great aircraft for just about any virtual pilot due to its appeal as a personal airliner, complete with a pressurized cabin and high speed cruise.

In the real world, the Duke is a great traveling aircraft, and this holds true in the simulator. After basic flight testing and landing practice, I took the B60 on numerous cross country flights ranging from 200 mile hops within Michigan, to a massive one stop flight down to Ft. Lauderdale. I enjoyed every second of flying the Duke, and I'm sure it will be a favorite of virtual pilots for years to come!

What I Like About The Beechcraft 60 Duke

- Very high levels of detail
- Bump Mapping!
- 3D Gauges
- Overall realism
- Included extras in the airfile (Belly landings/ditching, Single Engine Realism, Differential Braking)

What I Don't Like About The Beechcraft 60 Duke

- Not quite as frame rate friendly as prior RealAir releases (But still capable of running fine on medium to high end computers)

Printing

If you wish to print this review or read it offline at your leisure, right click on the link below, and select "save as"

[Beechcraft 60 Duke](#)

[\(adobe acrobat required\)](#)

Comments?

Standard Disclaimer

The review above is a subjective assessment of the product by the author. There is no connection between the product producer and the reviewer, and we feel this review is unbiased and truly reflects the performance of the product in the simming environment as experienced by the reviewer. This disclaimer is posted here in order to provide you with background information on the reviewer and any presumed connections that may exist between him/her and the contributing party.

[Tell A Friend About this Review!](#)

© 2009 - AVSIM Online
All Rights Reserved

Powered by AVSIM SimWords

Flight Simulator Links

Discover the world wide Flight Simulator Community. Enter your FS related website in the largest links database online.

www.avsim.com

AVSIM Reviews

Want to stay on top of the most recent ad ons? See our Reviews!

www.avsim.com

The Flight Simulator Network

The Social Network for Flight Sim Users and Developers.

Competitions, screenshots, videos, forums, live chat and more.

<http://flightsimulator.ning.com/>

Make Money with SimWords!

Join the ranks of websites earning an income from SimWords. Become a Publisher today!

www.avsim.com

Become a SimWord Publisher!

VRS F/A-18E NOW SHIPPING!

The first military true fly-by-wire add-on with the sophistication and realism of a high-end transport! NOW SHIPPING FOR FS9!

Vertical Reality Simulations