

AVSIM Commercial Aircraft Review

FSD International

Piper Navajo and Panther



Product Information		
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Description: AI Add-on.		
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Reviewed by: <u>David Swindle</u> AVSIM Staff Reviewer - Jun 8, 2007		

Introduction

The Piper Navajo is one of the best examples of an aircraft being developed at exactly the right time to become a success story in an industry that is notoriously difficult to achieve success in.

Development of the PA-31 Navajo began in the 1960's when William T Piper (for whom the Piper is named) noticed that there was a need for a medium sized, twin engined aircraft for the corporate world, small cargo carrier and feeder airline market, and decided that Piper could produce an aircraft to fill that gap.

After it was launched, the Navajo was almost an instant success. Over 2000 Navajos of various versions were produced before the production line shut down in 1984 amidst a lawsuit-driven downturn in the general aviation market. Throughout the production run of the Navajo, several versions were introduced that added more powerful engines, pressurization of a bigger cabin, and other refinements. In addition to the Navajo, Piper also produced the Chieftain, which was basically a bigger, more powerful Navajo intended for commuter airline use.

Even though the Navajo line stopped production over twenty years ago, the aircraft are still very popular with charter companies as well as small cargo companies that fly feeder routes for bigger cargo carriers.

Because the Navajo fleet is aging and beginning to suffer from fatigue and general wear and tear, a company by the name of Colemill Enterprises in Nashville, Tennessee has found considerable success in modifying Navajos and Chieftains into what are known as Panthers.

The Panther conversion runs about \$164,000 (in addition to the cost of the aircraft to be modified) and adds new 350HP engines with dual drive magnetos, four bladed "Q-tip" propellers, as well as a Shadin fuel management computer and new oil and fuel hoses for the engines. Colemill also offers "Zip-Tip" winglets (as a \$7500 option) which increases stability and also shortens the takeoff and landing distance required by the Panther. They also add landing lights that can be used in-flight to make the aircraft more visible.

Compared to a stock Navajo, the Panther gets off the ground in less distance, climbs and cruises faster, is quieter and more stable in flight, and has a shorter landing roll. Aside from the performance benefits bestowed by the Panther conversion, the modifications also dramatically increase the single-engine climb rate, which makes the Panther far safer in the event of an engine failure.

Installation & Documentation

The FSD Navajo\Panther package is available as either a 32MB download for \$29.95 (USD) or on a CD for \$34.95.

Test System
Asus M2N-SLI Deluxe Motherboard AMD Athlon 64 X2 5000+ Nvidia Geforce 7900GT 2GB RAM 300GB HDD Saitek X52 Pro CH ProPedals Windows XP Flying Time: 40 hours

After purchasing the product, FSD will send an e-mail with license information which needs to be put into the installer before it will work. The installer itself is pretty straightforward, but because it does have to connect to the internet to verify the purchase, some problems can arise with firewalls and anti-virus software, both of which should be disabled before running the installer.

Once the installer has run, it is necessary to run the load managers (the Navajo and Panther both have their own) to get the aircraft configured and working correctly in FSX. The load manager allows the user to adjust realism and "maintenance" settings for the aircraft, as well as add new paint schemes and to change weight and balance. Although the load manager sounds complicated, it is quite simple to understand and very easy to use.

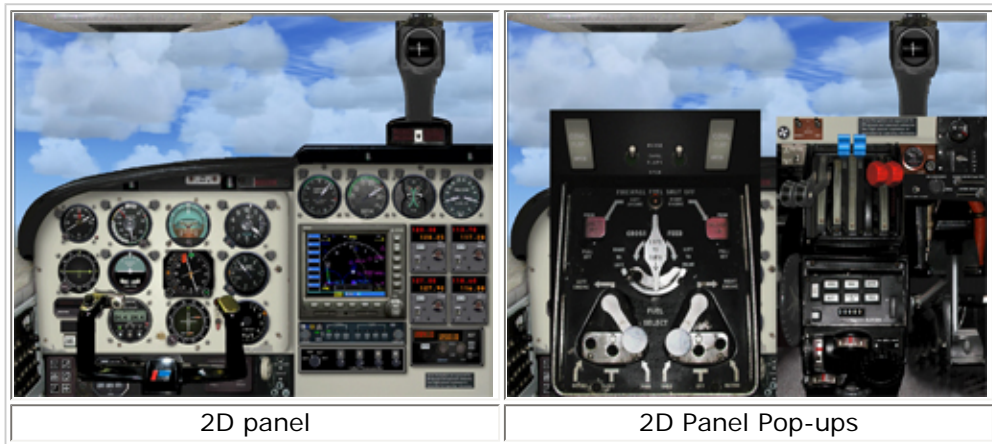
After running the load manager, it is a good idea to read the manuals that FSD have included. They provide information on how to use the load manager as well as a very detailed overview of the systems in the aircraft, checklists and performance data.

Unlike some other payware aircraft, the checklists and reference pages on the FSX kneeboard actually do contain checklists and reference data (although cruise performance data is only available in the manual), which makes the Navajo and Panther very easy to fly in FSX without having to do a bunch of printing from the PDF manual just to start the engines.

2D Panel

Although FSX has advanced virtual cockpits to the point where 2D panels are almost unneeded, FSD has included a very impressive panel with the Navajo\Panther package that is actually very useful within FSX.

The panel itself (the Navajo and Panther share the same basic panel in FSX) is very detailed, and shows a realistic amount of weathering, which is very appropriate for aircraft that are over two decades old. Like most other FSD panels, clicking on the primary flight instruments brings up larger versions of them. The gauges are large and sharp enough in the normal panel view that the pop-up gauges probably won't be used much, except on very small monitors. In addition to the pop-up gauges, there are also several other pop-up panels for things like the throttle quadrant, fuel selectors, overhead switches, GPS (although this is visible on the 2D panel normally), as well as some engine instruments that (in the real aircraft) are located on the far right side of the panel, past what the FSX panel shows.



2D panel

2D Panel Pop-ups

As might be expected, all of the instruments and controls function properly, and FSD have also added nice touches like a removable yoke and working sun visor. The panel also includes impressive night-lighting that looks extremely realistic and gives a very convincing impression of depth.

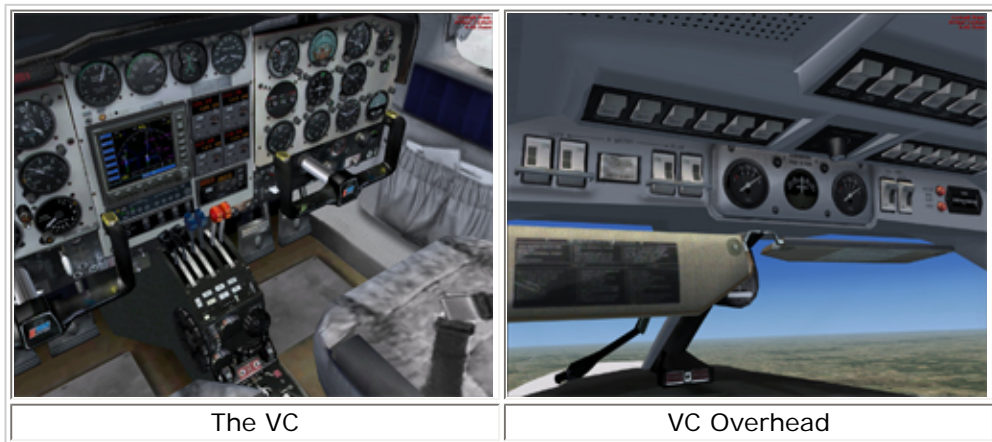
During my testing, I noticed no drop in performance in the 2D panel, and given that FSX still suffers from the poor VC lighting that plagued FS9, it is nice to have a 2D panel that can be used for instrument approaches.

Virtual Cockpit

One of the biggest advantages that FSX holds over FS9, is the improvement in virtual cockpit instruments. Despite being a slightly older design, the Navajo/Panther have VC's that hold up very well even when compared to aircraft designed specifically for FSX.

As in the 2D panel, the Navajo and Panther models both use essentially the same VC layout, which is correct since the Panther conversion doesn't require any noticeable changes to the cockpit.

The modeling in the VC itself is top notch, with the entire interior of the aircraft being rendered in 3D. FSD has included several "easter egg" animations for things like armrests, the sun visors, and even the refrigerator in the back of the cabin. FSD have also added working windshield wipers (which also move in the external view) and removable yokes, but the fact that FSX doesn't have rain effects in the VC means that the wipers don't actually do anything.



The VC

VC Overhead

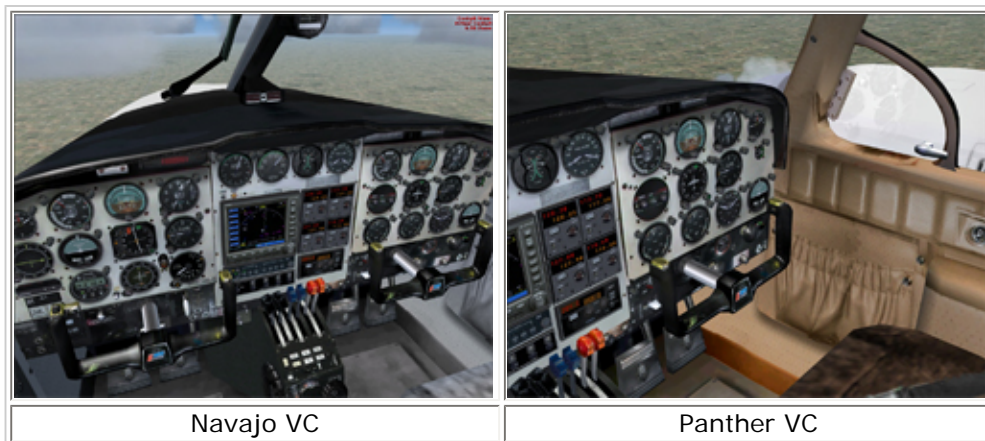
Much like the 2D panel, the instruments are all very sharp and easy to read. Clicking on the primary flight instruments in the VC brings up the same enlarged version of the instruments that appear in the 2D panel, which is a nice touch. In addition to looking nice, the instruments all move very fluidly with no noticeable hesitation or lagging. The VC also features some impressive night-lighting effects, which do a very good job of simulating the post lights found in the real aircraft.

FSD has done an impressive job on the VC textures, which make the passenger seats look quite comfortable while showing wear and tear on the controls in the cockpit. Although most of the textures look very nice, there are a few areas in the cockpit that use lower resolution textures which results in some areas (like the landing gear lever and surrounding area) standing out from the rest of the texturing.

For the most part, all of the switches and controls in the VC can be clicked and used, but in some situations the VC can be a

bit of a problem. The overhead panel, which contains the electrical, lighting and climate control switches as well as the starters and magneto switches, work almost flawlessly as do the controls and instruments on the main panel. But the fuel selector and autopilot (which are located on the floor) sometimes fail to respond to mouse clicks for reasons I couldn't figure out.

The fuel selectors are also a bit puzzling, since they seem to function slightly differently from their 2D counterparts which can lead to situations where the VC and 2D fuel selectors show the engines running on completely different tanks.



Navajo VC

Panther VC

Despite the level of detail and complexity of the VC, it doesn't have much of an impact on performance. I actually saw slightly higher frame rates than in some of the default aircraft.

External Model and Textures

Although the Navajo\Panther package originally dates back to FS9 and the models weren't purpose built for FSX, the external models and textures still look very impressive. The models themselves are almost flawless, with almost every possible detail, from the windshield wiper to the curtains on the passenger windows being modeled. FSD have done a very good job of capturing the differences between the Navajo and Panther; with the Panther sporting its distinctive cowlings, propellers and winglets, complete with landing lights.

The Navajo\Panther both have all of the standard animated controls surfaces, landing gear, and propeller blades that are expected of a modern payware aircraft are there, as well as a couple of extra touches like the animated windshield wiper, a window shade, pitot covers and chocks that appear when the aircraft is on the ground with the parking brake set.



Blue & Gold Navajo

AmeriFlight Navajo

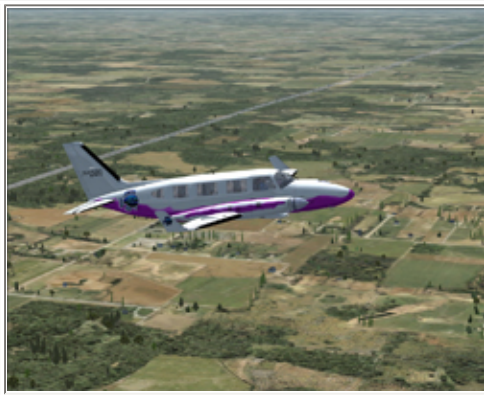
Navajo

After flying both the Navajo and Panther for some time, the only flaw I could find in the model is the fact that the Q-tip propellers on the Panther lack the distinctive bend back tips present on the real aircraft, which I assume was probably due to some limitation with how FSX handles animations for propellers.

"Out of the box", the Panther and Navajo only come with one texture each, but there are quite a few available for free from the FSD website that use auto-installers and the load manager to make installation very simple.



Denim Panther



Fishy Panther



Tazmanian Panther

The textures cover a wide variety of paint schemes, from well worn cargo carriers to elaborate private schemes, and all are of a uniformly high quality. Most of the textures show a reasonable amount of weathering for private or corporate aircraft, with some other paint schemes being liberally covered in dirt and exhaust staining. All of the textures make use of shine effects, which is used just enough to be convincing without making the textures excessively dull or shiny.

Although the textures are of very high quality, I did notice one problem with them. For some reason, the texture mapping seems to be slightly misaligned for the left and right sides of the fuselage on both the Panther and Navajo. This misalignment is most visible on textures that have a band of color running around the aircraft, since the bands don't quite line up where the textures meet at the nose.

Another thing I noticed with the textures (which isn't a flaw in the product) is the fact that even though the repaint installers have the option of installing the texture for both the Navajo and Panther, many of the repaints have a Panther emblem on the tail which looks decidedly odd on the Navajo. After some fiddling around, I discovered that it is possible to use freeware image editors to remove the Panther badging, although it takes some time to do so.

Despite there being quite a high level of detail on both the external models and textures, they don't seem to have much of an effect on performance. I noticed no performance difference from the FSD aircraft to the default FSX models which is good news for people without cutting edge systems.

Flight Model

If there is one area that FSD is best known for, it's their ability to create amazingly realistic flight dynamics, especially in the area of twin engine aircraft which are very poorly modeled in FS by default. The Navajo and Panther really show off FSD's expertise in flight modeling.

On both the Navajo and Panther, take off is pretty straightforward due to counter-rotating propellers, and even though both aircraft rotate at about the same speed, the Panther is noticeably quicker to get to rotation speed thanks to the four bladed propellers.

After takeoff, climb power is set at 38 inches of manifold pressure and 2500RPM, and the differences between the Panther and stock Navajo begin to make themselves more apparent. At the recommended climb power setting and speed, the Navajo will climb at between 1000 and 1500FPM, whereas the Panther will head upstairs at over 2000FPM.

Once at cruise altitude (which can be anywhere up to 24,000 ft, although the real-world aircraft rarely exceed), the Navajo will cruise at about 200kts with the Panther being about 15kts faster at the same power setting and fuel flow. Although both aircraft matched the published figures for power settings versus airspeed almost exactly, the fuel flows for both aircraft seem to be about 20% too low. From my research, I found that at 75% power at a best power mixture, the Navajo and Panther (since the FS versions are both modeled with the same engines) should burn about 20GPH per engine. The FSX versions only burn about 15-16GPH at the same power settings regardless whether auto mixture is used. After some experimentation, I discovered that changing the fuel flow scalar in the aircraft.cfg for both the Navajo and Panther to 1.166 resulted in fuel flows that were within 1GPH per engine for most power settings. This resulted in ranges that were considerably closer to the published specifications.

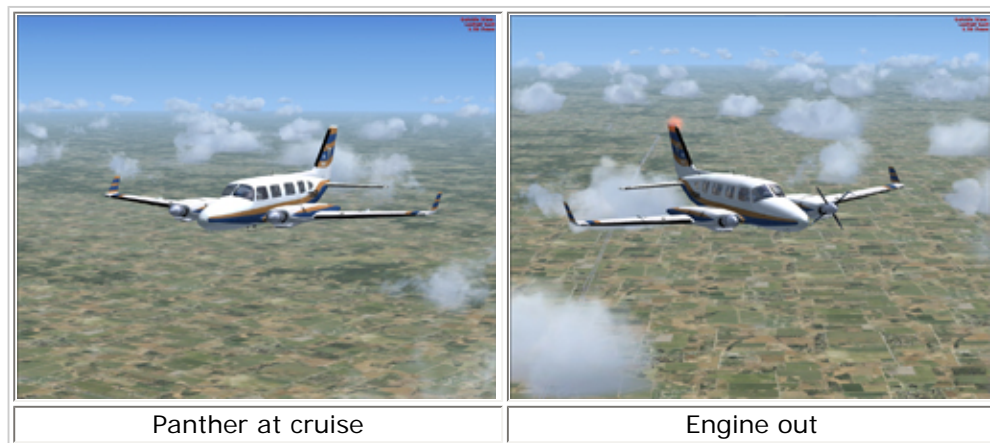


Although the Navajo is designed to go from point A to point B quickly, the flight dynamics really shine in maneuvering flight and in engine out situations. The Navajo and Panther are both very stable, and if put into a bank, require only small rudder and aileron inputs to stay at the desired bank angle without requiring huge aileron inputs to keep from rolling back out of the turn. Once trimmed correctly, both aircraft are very stable which makes hand-flying them very pleasant. This combination of stability and ease of maneuverability makes it very easy to hand-fly the Navajo and Panther in almost any weather condition, and it makes instrument approaches (especially ILS approaches) much easier.

In addition to having excellent hand-flying characteristics, FSD have also done a very impressive job with the engine out handling of the Navajo and Panther.

One area where twin engine aircraft for MSFS have traditionally run into problems, is in simulating Vmca. On twin engine aircraft, Vmca is the lowest speed the aircraft can safely be operated on one engine. Below that speed, insufficient airflow exists over the control surfaces to prevent the aircraft from rolling or yawing uncontrollably towards the dead engine. On most MSFS aircraft (including the default aircraft in FSX), slowing below Vmca with the remaining engine at full power results in no particular handling difficulties, which is incredibly inaccurate.

On the Navajo and Panther, FSD have done a very good job of simulating this loss of control. If the airspeed is allowed to bleed off too far, both the Navajo and Panther will become impossible to control until the airspeed increases enough for the flight controls to become effective again. I was also pleased to see that FSD have correctly modeled the effects of propeller feathering, and the Navajo and Panther both show a very noticeable degradation in both single engine climb and cruise unless the inoperative engine is feathered.



Another area where FSD have done an excellent job, is in representing the fact that the Panther has significantly better single-engine performance than the stock Navajo. With one engine out, the Navajo will climb at about 400FPM, but the Panther can climb at about 750FPM under the same conditions.

Aside from the engine-out handling characteristics, the FSD Pipers are also very pleasant to fly on approaches. The fact that both aircraft are very stable means that descents only require a power reduction, which results in a very nice, stable descent that can be controlled very precisely by simply adjusting the throttles. On final approach, once the gear and flaps are down and the power set, both Pipers settle easily into either a VFR approach in perfect weather or an ILS in poorer conditions. Landing is a simple matter of keeping the power set for 100kts over the fence and then just reducing power while maintaining a constant pitch attitude to a smooth landing.



Inside the cabin

Sounds

The real Navajo is known for being a loud aircraft for those who fly it, and this comes across well in the FSD package. The interior sounds do an excellent job of conveying what it would sound like to actually fly a Navajo, with a lot of propeller noise (thanks to the fact that the props are almost in line with the front seats of the aircraft) and a nice engine note mixed in. As throttle and propeller settings are changed, the sounds change accordingly and there are also the usual gear and flap sounds. The exterior sounds are also very well done, and do an excellent job of representing what a pair of turbocharged six cylinder engines sound like.

The only thing I didn't like about the sounds was the fact that both the Navajo and Panther share a sound set. While both aircraft use the same engines, the Q-tip propellers fitted to the Panther are significantly quieter than those fitted to the Navajo, which doesn't come through in the FSD versions.

Service & Support

Although the Panther and Navajo are fairly basic as FS add-on aircraft go, FSD offers excellent support if something does go wrong.

FSD offers support through both e-mail and a support forum. Both options seem to work equally well, with responses being delivered in under 24 hours and often within an hour or two.

In addition to a helpful support system, FSD have also done an admirable job of patching their product; with several service releases having been produced to fix a variety of small issues that showed up in the first release of the product.

Conclusion

Now comes the critical question; Is the FSD Panther/Navajo package worth the money?

My opinion is that the package is indeed worth the money, with two aircraft being represented, each with their own set of superb flight dynamics. Although the Navajo and Porter don't contain all of the bells and whistles that are starting to appear in newer, purpose designed FSX aircraft, they still look extremely good, and the excellent flight dynamics, sounds, and VC more than compensate for any lack of eye candy present in the models.

Overall, even with a few small hiccups (which are all pretty minor), the FSD Navajo and Panther are superb aircraft that are an excellent alternative to the default Baron and provide an extremely realistic flying experience.

What I Like About The Navajo & Panther

- Comprehensive documentation.
- Load manager makes installing extra textures and setting up the aircraft simple.
- Excellent flight dynamics, especially with single-engine handling.
- Well done VC, 2D panel, and external model, with almost no FPS impact.
- Many repaints available with auto installers.
- Excellent support.

What I Don't Like About The Navajo & Panther

- Some controls in VC can work sporadically.
- Texture mismatch on fuselage.
- Cruise fuel flow set too low.

Printing

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[**FSD Piper Navajo**](#)

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