AVSIM Commercial FSX Aircraft Review

Northrop T-38A (Talon) Jet Trainer

Product Information

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Introduction

Milviz are well known in the simming world for their military versions of airplanes that you can fly in FSX and the Northrop T-38A - JET TRAINER (Talon) is another gem from this small productive company.

According to their well laid out web site, Milviz has been around since 1990, as a supplier of games, TV, film plus products for FSX. Their motto (and it shows in the T38-A) is stated as "... has always been quality or why bother. We pride ourselves on the accuracy and detail of what we do, not just in modeling and painting but also in code and in flight dynamics." I like the idea that they have a 'team of real world pilots' who do both the 'flight testing and write the FDE's and the manuals.' I'm sure in this review I'll be able to see these qualities and accuracies demonstrated by the T38-A.
The T38-A is possibly one of the most evocative jet trainers used by the USAF, and it has been faithfully reproduced by Milviz. Make no mistake, this is no 'jump in and drive' model as you need to read the very comprehensive manual to get the best out of this superlative jet trainer. Although to be fair, there is a 'Quick Start" manual for those who just want to jump into the cockpit and fly!

Many pilots who trained on the T38-A mourn the passing of the T-38A's "round-dial" instrument panel (reproduced in the highest detail ['down to the last switch'] by Milviz which has been replaced with a modern, all-glass cockpit in the T-38C. So we have an historic aircraft well loved by all who trained in her and brought to the FSX table in vivid detail coupled with accurate flight characteristics, plus having the added bonus that real world Talon pilots had quite a lot of input.

I got ahead of myself when I started to review the aircraft as I had downloaded the original version not realizing that a service pack was imminent (in order to correct some minor technical issues). I created a small panic amongst the Milviz staff (for which I apologize) in that they thought I was going to review the Talon before they could get the service pack to me! Sorry guys (and gals)!

Well, to cut a long story short, I have now installed the service pack and this includes the following upgraded features (not all appended here):

- Restoring original (animated) pilots
- Exterior improvements to engine intakes
- Several Cockpit changes
- Changes to the After Burner (AB) configuration and application plus appropriate "clack" sounds.
- Updated sound files for various components/engines, etc.
- Speed brakes and landing gear changes
- Multi-player improvements and fixes

Plus many more enhancements too numerous to include here but available on the support forum.
Plus these features before SP V1

- Real life model replicas
- A high quality 3D VC
- 7 different liveries and more in free packs
- Paint kit
- Pilots Operating Handbook:
  - Realistic sound set.
  - Vivid night lighting, landing lights and custom effects.
  - Flight dynamics tested and tuned by real T-38A pilots.
- Exterior model manager

Background: (Courtesy of Wikipedia & Milviz)

So what can we say about the Talon? Well we know that it is an American twin-engine supersonic jet trainer. It was the world's first supersonic trainer and remains in service in several air forces throughout the world. We know that the Talon trains USAF, USN, NASA and NATO pilots and has done so since c1961 when it was introduced, with production ceasing in c1972, so it is remarkable that this plane still trains pilots today. A total of around 1200 T38's (mainly T38-A's) were built during its production run.

The build: Wikipedia reports that, "The T-38 is of conventional configuration, with a small, low, long-chord wing, a single vertical stabilizer, and tricycle undercarriage. The aircraft seats a student pilot and instructor in tandem, and has intakes for its two turbojet engines at the wing roots."

Design basics

"The T38-A is described as a low wing monoplane with a fuselage of semi-monocoque design constructed primarily of aluminum plus steel and titanium. The cantilever all-metal tail has a hydraulically powered rudder and single piece all moving tail-plane. The aluminum alloy multispar wings are fitted with heavy metal plate machined skins."

The Talon is powered usually by 2 × General Electric J85-5A (or J85-5R) afterburning turbojets providing this so called 'white rocket' with enormous climbing and maneuvering power. So, each engine develops of \(\approx 3,900 \text{ lbf (17.1 kN)}\)
thrust using the afterburner and around 2,000 lb (9 kN) of dry thrust. This phenomenal power gives the T38 a top
(gun) speed of Mach 1.3 (860 mph, 1,381 km/h) and 'pressed into the seat' climb rate of 33,600 ft/min (170.7 m/s).

Compare that to a Boeing 737 which is <2,000'/min, the Learjet 40 <3,000'/min and the Cessna Citation around
4,000'/min. Wow!!! This climb rate has to taken into context with the maximum allowable G-forces for the T38, which
are limited to "+6.0/-2.5G (3000 lb of fuel) when symmetrical, but + 4.3/-0G in unsymmetrical flight (where
"unsymmetrical flight" is defined as "full aileron deflection"). Reference.

That's why you need a G suit to fly the plane and unfortunately I don't possess one so I didn't get a chance to
experience these g-forces during the review.

There is even a T38-A Talon for sale in Texas at a meager $US 370,000 - a steal if you want to get to work quickly.
But wait there's more, its only 85% complete so you'll need to finish it yourself, at least it was re-painted in 2011.

The plane, not unsurprisingly, has been involved in many adverse incidents where there was either loss of life and/or
the crew ejected safely. This website details the vast majority of incidents involving the T38 (not all "A") with regards
to "Losses and Ejections". However, on the whole it is quite a safe plane to fly.

To me this is the best accolade for this plane, written by Buck Wyndham, Major, USAFR, in December 1999: "The
Talon is truly one of the great airplanes of our time. It is a timeless beauty, and has performed superbly for over four
decades as an advanced trainer in several air forces around the world, as well as a test support vehicle, chase ship,
companion/proficiency trainer, light attack/fighter trainer, air show performer, and privately-owned personal rocket
ship. While not a complex or difficult airplane to fly, it nevertheless has some unique flight characteristics which
demand absolute precision and discipline from its pilot. More than 50,000 student pilots have received their Air Force
wings in the Talon and, with the old airframes now being refurbished and reborn as the T-38C Talon II, many
thousands more will get to experience the thrill of riding the "White Rocket" in the decades ahead."

Now for some terminology

Supersonic Flight - Courtesy of Wikipedia

Supersonic flight by a plane is achieved when it exceeds the speed of sound (Mach 1), which is (in dry air at a
temperature of 20 °C (68 °F)) = 343 m/s, 1,125 ft/s, 768 mph or 1,236 km/h (668 KIAS). This is an excellent article.
**G Force - Courtesy of Wikipedia**

The full name is gravitational force and is described as the force applied to an object and is expressed as its acceleration relative to free-fall (due to the gravity at the earth’s surface) and is expressed in multiples of the acceleration of gravity. The normal unit is 1g or 1G defined as 9.80665 m/s², or $9.80665 \text{ N of force} / \text{kg of mass}$.

Pilots are usually subject to vertical-axis g-force and a typical pilot can handle about 5 g (49 m/s²) before losing consciousness but using special g-suits and intensive muscle training increases this to a sustained 9 g (88 m/s²). There are varying levels of loss of consciousness from Grey-out, Tunnel vision, Blackout, G-LOC (a loss of consciousness) and finally Death.

**TACAN - Courtesy of Wikipedia**

TACAN, a military air navigation system, has a few meanings including: Tactical Air Navigation; Tactical Airborne Navigation; Tactical Control and Navigation, with the first description being the usual one applied to the acronym, TACAN. In other words, TACAN is the military version of the civilian VOR/DME system.

It operates between frequencies of 960-1215 MHz, and is considered to be more accurate (about 3× more accurate) than the civilian VOR because it uses two frequency principles, with 15 Hz and 135 Hz components. TACAN stations are frequently co-located with VOR facilities, and are known as VORTACs. TACAN stations operate at distances up to 390NM, and have the advantages they are mobile i.e. they can be operated form the back of a truck.

However like VOR/DME's TACAN will eventually/probably be replaced by the ubiquitous GPS.

**Armaments and Ordnance:**

Some T-38A variants were also used for weapons training, they were designated as AT-38B's and were fitted with a gun-sight and could carry a gun-pod, rockets, or bombs on a centerline pylon. These are not modeled in the Milviz T38A.

**Thunderbirds: - Courtesy of Wikipedia**

The 'Thunderbirds' are the aerobatic team of the USAF based at Nellis AFB in Las Vegas, Nevada, and the team adopted the T-38 Talon because it was more fuel efficient than the F-4 Phantom, (which it replaced). Due to an unfortunate crash involving the Talons in 1982 (aka the "Diamond Crash") the Talon was replaced by the F-16A Fighting Falcon.

**Afterburner**

This is a jet engine component that provides extra thrust to a military jet aircraft during take-off and during supersonic flight. To create the extra thrust extra fuel is injected into the jet engine after the turbine. The disadvantage is that using the afterburner results in very high fuel consumption and it is relatively inefficient. It should only be used in short burst where possible. In the Talon this nearly doubles 'normal' thrust and this feature is well modeled in the Milviz T38.

**Installation and Documentation**

**Installation:**

Installation is simple, unzip the downloaded 180MB zip file and then just double click the resulting self-extracting "exe". Using the same procedure I also installed the SP V1 over top without issues. The program automatically creates a folder in the Directory\FSX\Simobjects\Airplanes\T-38A Milviz which contains the usual files including the manuals models and textures being around 500 MB in size.
**Documentation:**

The documentation is comprehensive and you receive a 241pp Pilot's Operating Handbook (POH), a 10pp Quick Start Guide (very useful), a 36pp GNS 430 manual, and a 47 pp GNS 530 manual. The two GNS manuals seemed to be originally produced for the Milviz Cessna 310R and not specifically for the Talon.

I found the quick start guide to be very useful and it does allow you to fly the plane with minimal preparation. Reviews by their very nature can only skim a particular add-on's functions and details and so if you need to fly this plane seriously you really need to read the POH which contains comprehensive details on all aspects of this plane. It will take time but it will be worthwhile to get a much deeper understanding of this trainer.

As I said earlier, my main bible was the quick start guide (although I did have the POH on my iPad so that I could refer to it if needed) and this is a down to earth practical guide on how to fly this plane. It covers the basics including take-off, slow flight, aerobatics, approach (TACAN navigation) and landing. The documentation on the two GNS units is also excellent and these two units use the GPS500 functions from FSX and Milviz transform them into crystal clear instruments that are easy to program and use.

**System Requirements**

This product requires FSX SP2 or Acceleration. It is also designed for newer systems. Minimum requirements are 2.6 Core 2 Duo, 512mb Video Card and 510 MB of free disk space.

**Free AI Package**

Milviz also offers a [free T-38A AI package](#) with several airbases, traffic plus other 'goodies'. (available: . Note: This add-on is not supported and is installed at the Simmer's own risk.

**The Aircraft**

**FSX settings: Realism Settings**

I modified my settings from my usual (now known to be unrealistic) full realism to a reasonable middle of the road one but I did turn off (as recommended in the quick start guide) g-forces as I would be wearing a virtual g-suit when flying this plane.

**FSX Selection**

Under publisher there is a section for 'Milviz' and opening this we see 12 small thumb screenies of all the included liveries with 7 distinct "Thunderbird" liveries. Clicking on one of the thumbs gives basic details of each aircraft.
Controls

This is my standard statement: In general, these are the default FSX controls and I assigned them to my Saitek X-52, TQ and rudder pedals, (assigning and calibrating in FSUIPC4) and they worked without issue. The various buttons and switches are also very easy to apply on your controller, and using FSUIPC4's plane specific options I was able to apply all assignments just to the T38-A Talon’s. Once calibrated the plane responded to the controls as one would expect within the limitations of the flight model!

Starting FSX with the Northrop T38-A(s) and Flights as the default plane/flight

I had no issues selecting the plane variants or flights or opening any one of them in FSX from the starting screen, and the thunderous roar of the jet engine during FSX loading makes you aware that you are about to experience a very unique plane!

Frame Rates

No significant adverse effects that I could discern.

Fuel System

The real world Talons appear to be fitted with 4 x “bladder” fuel tanks, being three fuselage bladder tanks and a dorsal bladder tank having a total capacity of 583 gallons (2,206L) of usable fuel and these are depicted in the Milviz T38-A POH as the fuselage forward and dorsal cells, fuselage center cell, and the fuselage aft cell, i.e. as in the real world. Therefore, each engine is fed by a separate and independent dual fuel system, i.e. feeding the port engine from the centre and aft fuselage tanks, and feeding the starboard engine from the forward fuselage tank and dorsal tank.

These are depicted by Milviz in the FSX fuel and payload screen for the T38 showing the 2 independent fuel "AUX" systems (representing the 4 physical tanks), being the left auxiliary and the right auxiliary containing together 583 gallons of fuel. In the plane there are two fuel quantity indicators, one for each fuel system. The POH explains in detail on how to maintain the centre of gravity (COG) when using the right and left fuel systems. Obviously with a plane capable of high speeds you have to take care to prevent flame-outs when diving steeply and/or flying inverted.

Maintenance and Payload:

There are no engine/airframe maintenance, repair or failure options in this Milviz model. Payload is via the default FSX payload and fuel, and the only options to change are the pilot and trainee which weigh in at a healthy 190 lb (US)
each. The co-pilot weight appears even if there is only the pilot chosen in the sim, but this is a minor aberration.

Specifications of the T38-A (Courtesy Wikipedia)

General characteristics

- Crew: 2: student and instructor
- Length: 46 ft 4.5 in (14.14 m)
- Wingspan: 25 ft 3 in (7.7 m)
- Height: 12 ft 10.5 in (3.92 m)
- Wing area: 170 ft² (16 m²)
- Empty weight: 7,200 lb (3,270 kg)
- Loaded weight: 11,820 lb (5,360 kg)
- Max takeoff weight: 12,093 lb (5,485 kg)
- Powerplant: 2 × General Electric J85-5A (J85-5R after PMP modification) afterburning turbojets
- Dry thrust: 2,050 lb (9.1 kN) each
- Thrust with afterburner: 3,850 lbf (17.1 kN) each

Performance

- Maximum speed: Mach 1.3 (858 mph, 1,381 km/h)
- Range: 1,140 mi (1,835 km)
- Service ceiling: 50,000 ft (15,240 m)
- Rate of climb: 33,600 ft/min (170.7 m/s)
- Wing loading: 70 lb/ft² (340 kg/m²)
- Thrust/weight: 0.65

The Exterior Inspection:

The POH contains a lovely diagram on how to carry out an exterior inspection, so I used this as my template to report on the external physical attributes on this fine model. Starting on the port side aft of the wing, (left forward section) we see the clean smooth lines of the inlet ducts, the beautifully sculpted, wheel hydraulics, the tire profile and the various inlet ports all impressively modeled.

Walking round the pointy bit to the right (starboard) forward section, we see the incredible detail continuing with the lights and various inlet ports. On to the right center section, we notice the detail wing structure, the wheel suspension and tire condition amongst others.

Moving to the right aft section the quality continues with the speed brake detail (lowered for this part of the review), the huge jet engine exhaust outlets (the noise at this point is deafening) and the small tail wing and looking at the massive vertical tail/rudder system.

Moving on once again to the Left aft and finally the left center section with no loss of detail or quality. An excellent exterior in all aspects.
There are lots of animations modeled in the Milviz T38, in the interior all the switches, knobs, and gears are faithfully reproduced and work with a mouse click or being assigned to your favorite controller. As Milviz state, "Even the
translucent gear handle operates and looks like the real thing", and that goes for the rest of the cockpit equipment.

On the outside I particularly liked the way that the nose gear retracted, i.e. to the front of the plane as in real life. The start-up "huffer" (see below), the wheel chocks, canopies and crew ladders are all reproduced. One caveat don't try to open the canopies when near the fuel reload station otherwise they open and then close in quick succession.

The night lighting (see below) also works well and is extremely realistic. So there are animations galore and I will discuss the individual ones in the appropriate section.

Repaints

A full high resolution repaint kit is provided by Milviz, and there are quite a few repaints available via the forum.

Pilot/Crew Access

Cockpit

The two tandem (front to back not side by side) cockpits are air conditioned and pressurized, and each has a separate manually opening/closing canopies, being hinged at the rear and having separate jettison mechanisms, so you could jettison one without the other. The cockpits are separated by a windshield, and are equipped with separate rocket-powered ejection seats.

The rear cockpit seat (usually occupied by the instructor) is raised by 25cm (1") to give a clearer forward view and keep an eye on that rookie who thinks he's Tom Cruise. The cockpits open and close and the crew ladders appear when you use the exterior model manager using the Shift + 2 key in the sim and choose ladders.

Note: with engines running pressing the ladders the canopies only open, the ladders only appear with chocks when the engines are 'cold and dark'.

Internal

The VC, like the rest of the plane, is excellent befitting the description; " high quality 3D VC". All of the instruments are clear and suitably aged. This plane looks like its flown a few sorties before I got my hands on it. Now this plane has two cockpits and hence because it's a 'trainer' it has two sets of instruments and most of the instruments (not all) are duplicated in both areas.
The main instrument panel is the same in both cockpits, as you would expect, and this contains the main flight/navigation instruments and switches plus the landing levers and gear position indicator lights. This is an analogue cockpit layout and the included GPS units are accessed via the Shift + 3 key. Whilst the GPS units are not strictly accurate (in reality terms), they are a welcome addition when planning long fast flights.

In the front cockpit we also have 2 sub-panels (Port/starboard) and the left sub-panel contains the flap indicators, intercom, landing/taxi light switch, fuel shut-off switches and the all important engine start buttons. The right front cockpit subpanel contains the cockpit environment knobs/switches, air inlets, fuel controls, pitot heat switch and the canopy ejection system.

In the rear cockpit the sub panels are simpler and do not contain all the instruments seen in the front, and these omissions are displayed in the POH. Back to the front cockpit and we see several console panels with two main panels left and right, containing such items as the throttles, speed brakes various circuit breakers, Anti-G suit testing button, warning lights and cabin lights' controls. These are again well described and illustrated in the POH.

Again in the rear cockpit the left and right consoles contain similar instruments again with a few missing. Operating the instruments can be either using the mouse button or assigning to a joystick and the sounds accompanying the clicks, etc are extremely satisfying. Rotary switches are easily operated using the middle mouse key or a rotary switch on your joystick. I had no issues in changing values or operating any of the switches/instruments, so they all worked like they should. To reiterate, both cockpits are very well modeled and show that patina of age and they do look like they have used and re-used many times.

The night lighting of the instruments is excellent and these can be dimmed or have the intensity increased using rotary switches in the VC. Turn the intensity up too much and the instruments become over exposed, but with good settings the instruments are realistically illuminated.
The Pop-Ups and Switch selections

The Shift + Numeral Keys show the various pop-ups for the planes and these do not appear to differ according to the livery.

The basic key strokes are:

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<td>SHIFT + 1</td>
<td>Display/hide main panel - ADI HUD-like</td>
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<tr>
<td>SHIFT + 2</td>
<td>Pre-Flight Utility (Exterior)</td>
</tr>
<tr>
<td>SHIFT + 3</td>
<td>Display/hide GPS</td>
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The preflight utility is very good, here you can select solo/dual pilot(s), the travel pod, canopies open plus crew ladders, and the two 'huffers' (fixed base and ground cart) including chocks. The pre-flight utility animations are only displayed in the exterior views.

The GPS units use the FSX database, but are high quality units taken from the Milviz Cessna C310R if the manuals are anything to go by. If you understand how the default GPS gauges work then you shouldn't see any issues with these. Nice gauges, slightly out of place in a military jet, a handheld option might have been a useful alternative.
**Starting the Engine**

The engine can be started with Ctrl + E, but in this plane it is much more satisfying to start the engines using the procedure described in the POH, and using one of the ‘Huffers’. The T38 does not have built in APU so it needs an external source to start the engine.

Enter the 'huffer', which is a huge external compressor that blows large volumes of pressurized air (at low pressure) to turn the blades of large gas turbine jet engines so they rotate fast enough (and pressurize) to start the engine, i.e. create enough pneumatic pressure for ignition. This is a simplistic view of what the 'huffer' does but it is very well modeled in the Milviz T38 down to the sounds of the compressed air rushing in, and it works!

In the case of a 'flame-out' when flying the plane would have to get the turbine blades spinning fast enough (windmill start), say by diving, so that they could be re-started as it's difficult to fly a jet fighter with a 'huffer' attached. The POH describes the correct technique for starting the engine, starting one engine before the other, i.e. right engine first followed by the left.

Note: the throttles must be in the idle position in order to start the particular engine. As with all jet engines ground crew have to careful where they stand or move from one side to the other due to the jet exhausts - very hot and very powerful. It is not a good idea to barbecue your mechanic.

**On the Ground – Taxiing**

The forward view is not brilliant but you do get enough view to taxi without hitting anything. The nose-wheel turns with the rudder, and I used the rudder pedals to steer the plane during taxiing and that was fine. I saw in many videos the pilots taxi with the canopy open and Milviz issue this caution: "Do not exceed 50 KIAS while taxiing with a canopy open". I didn't!

Once you are in position to take off the nose-wheel steering must be disengaged, achieved with a switch on the cockpit panel (vice versa for landing), otherwise like me you do not go down the runway but off into the 'rough' at the side of the runway.

**Take-Off**

The POH details a pre take-off and line-up check list that needs to be complied with in order to achieve a smooth lift off. This is what I did: I closed and locked the canopy, I followed the POH checklist, I set the trim to the take-off trim (button indicator light), I turned off nose-wheel steering, I applied the brakes advanced the throttle to Military setting, I released the brakes and advanced the throttle to afterburner as we were moving, at around 120 KIAS I eased the stick back, rotated at 135 KIAS and lift-off occurred at around 150 - 160 KIAS.

I then raised the gear and any flaps as soon as we were airborne and then there was the adrenalin rush as this bird can climb up to 30,000'/min, but I kept my cool and climbed at a more modest 5 degrees on the ADI at around 300KIAS (approx 2000'/min), reducing to military power.

I performed fast climbs at around 20 - 25 degrees on the ADI (using the recommended climb Mach) with the afterburner going full bore. These procedures are described in detail in the manual.
In Flight

What you notice in the YouTube® videos of the T38 is that how bumpy the ride is*, the cockpit seems to constantly shudder and shake as you fly and it's something that you miss in FSX, there is some movement obviously and probably something like EZDOK would enhance the feeling. This is a fast plane and because of those short stubby wings you have very little lift so you need to ensure when flying that you don't go too slow as recovery may not always be 100%.

The controls are light and precise and at my middle of the road realism settings everything felt just right with the plane going where I pointed it. Level Flight is easy to achieve and you can maintain speed and altitude with judicious use of the throttle and trim. The flight characteristics seem accurate down to the fact that to turn this plane, you have to roll and then pull her around watching carefully that you do not lose too much altitude.

Several times I inadvertently flipped the plane over or it shuddered into an almighty stall. Slow flight is achieved by dropping the gear and flaps (I used the speed brakes to slow me down) and then a comfortable slow speed of between 190 to 210 KIAS was possible, with the controls feeling heavier.

* However, for a real thrill, take out the Talon on full AB at low level dialing up a thunderstorm, using my old FF joystick the shuddering and movement through the sky (with me wildly overcompensating) just about blows you away. Up and down, side to side and upside down just isn't in it. Very exciting.

Once I'd burned off some fuel, I tried some basic aerobatics and these included loops, barrel rolls, inverted flight and steep turns. This plane at the correct speed is extremely forgiving and these aerobatic manoeuvres were easy to perform. These are aerobatics that can be achieved with this plane:

- Lines (horizontal & vertical),
- Loops,
- Rolls,
- Spins, and
- Hammerheads.
Descending & Landing

I used the procedure outlined in the quick start guide, descending at around 280 KIAS (80% power), 5 degrees nose down or apply the speed brakes and use 10 degrees nose down at 280 KIAS; once at altitude, I increased power to 85% and maintained a speed of around 240 - 250 KIAS. I flew the pattern as designated for the airfields and I found that to be fairly difficult due to the speed that you are travelling i.e. well over 200 KIAS, whereas I'm used to the sedate speed of a little Cessna at around a 100KIAS.
For the approach, I reduced speed to 220 - 230 KIAS, dropped the landing gear, applied 60% flaps which reduced speed to around 170 KIAS power increased to 95% and dropped in over the threshold at about 150 - 155 KIAS, on touchdown I reduced the throttles to zero, raised the nose so that the main gear landed first and as the speed reduced to around 100 KIAS I allowed the nose to touch down, and used the brakes to slow down to taxi speed.

Using this technique made landing quite an art and several times I came in far too slow and never made it to the runway or came in at over 200 KIAS and ploughed the field at the end of the runway.

Both the manual and quick start guide give excellent instructions. Using the Shift + 1 key option brings up the ADI (HUD like - the T38-a does not have a "real" HUD) and AOA indexer and using these two together (with lots of practice) gives a great method to land this plane without pan caking on the tarmac or never reaching the runway.

**Navigation in Flight**

For navigation between two airfields including appropriate SIDS and STARS, I used the onboard analogue navigation instruments and cheated a little if I thought that I was lost by using the pop-up GPS unit which cleverly have the flight plan installed. There is no autopilot so you have to fly manually using your instruments which are well laid out and accurate.

You can actually set the NAV switch to TACAN, LOCALIZER or ILS, with a detailed section in the flight director system being found in the manual. Essential reading! The TACAN settings are obviously different to the VHF frequencies and take some getting used to, and there is an excellent listing in the POH and on the kneepad in the plane.

It took me some getting used to the TACAN system with lots of back up views to the GPS to make sure that I was flying the flight plan that would get me where I intended to be going. Strangely enough I found it easier to navigate with the analogue gauges than I did in a previous jet fighter which had a glass cockpit. A very good navigation system that is also accurate in use with great descriptions in the POH/Quick start guides.

**Power-off Landing:**

I found these quite difficult as speed and rate of descent are critical, get too slow and you fall out of the sky like a stone, do it too fast and descend too deep and you will never make the intended runway. I used the parameters outlined in the POH which gives the distance you can travel with no engines from a certain height and using a standard glide speed.

So if the engines failed at 50,000', you could 'glide' to an airfield at 230 KIAS (zero fuel plus 1KIAS/100lb of fuel remaining) which was up to 78 miles away, and likewise at 10,000' you could only get to an airfield about 16 miles away. So you can see the calculation is difficult and any wind could play havoc with your plans. I managed around 10% 'safe' landings.

**Stalls and Spins**

As I said earlier, it was quite easy to induce stalls/spins by heavy handed use of the controls. The stall buffet is excellently reproduced in this Milviz creation down to the appearance of the slow AOA!

Recovery is classic textbook, i.e. release the back pressure, lower the nose and adjust the throttles to fly out of the stall. With the spin I found that it was easy to over correct and go into a reverse spin until I learned to use the controls properly. This seemed very realistic to me. Again with a FF joystick there is a huge amount of feedback on the point of stall.

**Sounds**

The sounds are excellent, with great depth and clarity and have been developed for this Talon. I had a couple of sound issues on my system in that sometimes when loading the plane the jet engine would be roaring away quite loudly and if I paused the game the sound continued on some occasions. These issues were intermittent and seemed to be idiosyncratic to my machine.

I did not notice any churning/recycling of sound and the sounds seemed similar to ones that I heard and saw on YouTube® videos for a real world plane. There was some discussion on the forum that the sounds resembled those of
the Learjet but they seemed excellent to me. The start-up sequence of the engines is particularly good as is the fly-by sound as the aircraft passes overhead.

Uninstall:

I could not see any instructions for uninstalling this bird, but I cannot foresee any issues in its removal.

Support:

This is by email and/or by registering on the [support forum](http://www.avsim.com/pages/0911/Milviz/T38.html) (i.e. proof of purchase). I used both methods and it is excellent and quick.

My request for a very small minor upgrade to the pay-load option was taken very seriously with a lot of effort put in an attempt to find a solution. So top marks for excellent support.

Summary / Closing Remarks

An excellent, accurate, lovely reproduction of a two set jet trainer. It is very fast, it's fun and it isn't too pricey and it gives you a thrill a minute. In the review I could only skim the surface on what this plane can do and if you are into small, supersonic military jets this one could keep you occupied for the next couple of decades.

The detail is just outstanding and unlike many planes, the interior looks like they have been used and then used some more. The exteriors are crisp and clean and they look good from all angles.

It was not called the 'White Rocket' for nothing, because it can climb and race through the skies like a veritable rocket. A nice jet to install in your virtual military hangar.

Compare these two to the real life variants above: Randolph AFB and Cuddeback Dry Lake

<table>
<thead>
<tr>
<th>What I Like About The T-38 Talon</th>
</tr>
</thead>
<tbody>
<tr>
<td>● The performance</td>
</tr>
<tr>
<td>● The fantastic VC cockpits</td>
</tr>
<tr>
<td>● The handling - superb</td>
</tr>
<tr>
<td>● The thrill - sweaty palm stuff</td>
</tr>
<tr>
<td>● The nice clean lines of the skin</td>
</tr>
<tr>
<td>● The incredible detail of the instruments and skin</td>
</tr>
<tr>
<td>● The starting procedure and sounds</td>
</tr>
</tbody>
</table>

What I Don't Like About The T-38 Talon

- I'm a bit iffy about pop-up GPS units but they were useful

Printing

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Northrop T-38 Talon - Jet Trainer

(adobe acrobat required)

Comments?

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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.

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