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THE ALL NEW F-111 AARDVARK for FSX win a copy

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Virtavia General Dynamics F - 111 for FSX

Technical Specification : General Dynamics F111 General characteristics :

Crew : 2 (pilot and weapons system operator) Length : 73 ft 6 in Wingspan : Spread: 63 ft; Swept: 32 ft Height : 17.13 ft Wing area : Spread: 657.4 ft²; Swept: 525 ft² Airfoil : NACA 64-210.68 root, NACA 64-209.80 tip Empty weight : 47,200 lb Loaded weight : 82,800 lb Max. takeoff weight : 100,000 lb Powerplant : $2 \times$ Pratt & Whitney TF30-P-100 turbofans Dry thrust : 17,900 lbf each Thrust with afterburner : 25,100 lbf each Zero-lift drag coefficient : 0.0186 Drag area : 9.36 ft² (0.87 m²) Aspect ratio : Spread : 7.56, swept: 1.95

Performance :

Maximum speed : Mach 2.5 (1,650 mph) at altitude Combat radius : 1,330 miles Ferry range : 4,200 miles Service ceiling : 66,000 ft Rate of climb : 25,890 ft/min Wing loading : Spread : 126.0 lb/ft² ; Swept : 158 lb/ft² Thrust/weight : 0.61 Lift-to-drag ratio : 15.8

Armament :

Guns : 1× 20 mm M61 Vulcan 6-barreled gatling cannon in weapons bay (seldom fitted)

Hardpoints : 9 in total (8 × under-wing, 1 × under-fuselage between engines) plus 2 attach points in weapons bay with a capacity of 31,500 lb (14,300 kg) and provisions to carry combinations of:

Bombs :

Free-fall general-purpose bombs Mk 82 (500 lb) Mk 83 (1,000 lb) Mk 84 (2,000 lb) Mk 117 (750 lb)

Cluster bombs :

BLU-109 (2,000 lb) hardened penetration bomb Paveway laser-guided bombs, including 2,000 lb GBU-10, 500 lb GBU-12 and GBU-28, specialized 4,800 lb penetration bomb BLU-107 Durandal runway-cratering bomb GBU-15 electro-optical bomb AGM-130 stand-off bomb

The General Dynamics F-111 was an all-weather attack aircraft, capable of low-level penetration of enemy defenses to deliver ordnance on the target. The F-111 featured variable geometry wings, an internal weapons bay and a cockpit with side by side seating. The cockpit was part of an escape crew capsule. The wing sweep varied between 16 degrees and 72.5 degrees (full forward to full sweep). The wing included leading edge slats and double slotted flaps over its full length. The airframe was made up mostly of aluminum alloys with steel, titanium and other materials used in places. The fuselage was made of a

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semi-monocoque structure with stiffened panels and honeycomb sandwich panels for skin.











The F-111 used a three-point landing gear arrangement with a two-wheel nose gear and two single-wheel main landing gear. The landing gear door for the main gear was positioned in the center of the fuselage and also served as a speed brake in flight. Most F-111 variants included a terrain-following radar system connected to the autopilot. The aircraft was powered by two Pratt & Whitney TF30 afterburning turbofan engines. The F-111's variable geometry wings, escape capsule, terrain following radar, and afterburning turbofans were new technologies for production aircraft.

USAF F-111 variants were retired in the 1990s with the F-111Fs retired in 1996 and EF-111s retired in 1998. In USAF service, the F-111 has been effectively replaced by the F-15E Strike Eagle for medium-range precision strike missions, while the supersonic bomber role has been assumed by the B-1B Lancer. The RAAF was the last operator of the F-111, with its aircraft serving until December 2010.

Weapons bay :

The F-111 featured an internal weapons bay that could carry bombs, a removable 20 mm M61 cannon, or auxiliary fuel tanks. For bombs the bay could hold two 750 lb (340 kg) M117 conventional bombs, one nuclear bomb or practice bombs. The F-111B was to carry two AIM-54 Phoenix long-range air-to-air missiles in the bay. The cannon had a large 2,084-round ammunition tank, and its muzzle was covered by a fairing. However, it was rarely fitted on F-111s.

The F-111C and F-111F were equipped to carry the AN/AVQ-26 Pave Tack targeting system on a rotating carriage that kept the pod protected within the weapons bay when not in use. Pave Tack featured a forward looking infrared (FLIR) sensor, optical camera and laser rangefinder/designator. The Pack Tack pod allowed the F-111 to designate targets and drop laser-guided bombs on them. Australian RF-111Cs carried a pallet of sensors and cameras for reconnaissance use.

The FB-111 could carry two AGM-69 SRAM air-to-surface nuclear missiles in its weapons bay. General Dynamics tested an arrangement with two AIM-9 Sidewinder air-to-air missiles carried on rails in a trapeze arrangement from the bay, but this was not adopted. Early F-111 models had radars equipped to guide the AIM-7 Sparrow medium-range air-to-air missile, but it was never fitted.

External ordnance :

Each wing was equipped for four underwing pylons. The inner two pylons on each wing would rotate to align with the fuselage, while the outer two were fixed. Each pylon had a capacity of 5,000 pounds (2,300 kg). Various bombs and missiles could be carried on the pylons. Auxiliary fuel drop tanks with 600 US gallons (2,300 L) capacity each were also able to be carried. The design of the F-111's fuselage prevents the carriage of external weapons under the fuselage. But two stations are available on the underside for electronic counter-measures (ECM) pods, and/or data link pods; one station is on the weapon bay, and the other on the rear fuselage between the engines.

Photo : USAF - Public Domain

The F-111's maximum practical weapons load was limited, since the fixed pylons could not be used with the wings fully swept. Tactical F-111s were fitted with shoulder rails on the four inner swiveling pylons to mount AIM-9 Sidewinder air-to-air missiles for self-defense. Australian F-111Cs were equipped to launch the AGM-84 Harpoon anti-ship missile, and the AGM-142 Popeye stand-off missile. FB-111As could carry the same conventional ordnance as the tactical variants, but their wing pylons were more commonly used for either fuel tanks or strategic nuclear gravity bombs. They could carry up to four AGM-69 SRAM nuclear missiles on the pylons.

Source : Wikipedia - http://en.wikipedia.org/wiki/General_Dynamics_F-111_Aardvark - under the CC-BY-SA license



F-111 external payload of BLU-107 Durandal concrete penetration bombs. Photo USAF - Public Domain

Walkaround :

We will be doing our test flight from RAF Lakenheath , Suffolk, England, where the F-111 was operated by the 43TFW up to 1992. Our aircraft is 702390 an F-111F.

Fuselage :

My first impression of this aircraft is how large it was, and it also takes me back to the times when I use to see these aircraft on a daily basis flying over my house in Oxfordshire, England. Where they operated from RAF Upper Heyford, which today is sadly only used as a car storage facility.

Starting at the pitot tube at the tip of the radome Virtavia have captured the distinctive shape of the F-111s nose cone which is a flat angled profile leading from the structure in front of the cockpit down to the curved lower profile. (*See screenshot*)

Moving aft along the belly of the aircraft we first come to a small antenna and almost directly behind that the strike camera housing. Three quarters of the way back from the strike camera housing to the nose undercarriage bay there is another antenna.





Superb Afterburner effects, with variable nozzles dependant on power setting.

There are various variants of the F-111 represented in this package, though most of the differences are in the armaments and additional sensor packs which replace the bomb bay. The Raven model however does have two rear facing exhaust vents on each side of the fuselage next to the bomb bay mounted electronics pod. Two large side mounted antennas below the wing and in line with the main gear. Four blister antennas, two on each side of the vertical fin, plus the large antenna cluster housed in or on the bulbous cowling at the top of the fin. Two tear drop shaped antennas mounted on masts on the front top surface of each wing in line with the in flight refuelling port. Most of these items are indicated with a yellow circle on the image of the Raven below.









Bomb bay doors have 'V' profiles to allow for the dropping of free fall nuclear weapons. The doors also hinge to allow ground clearance for ordinance loading.



Exhaust nozzle detail.



Fuel dump valve and vent.



All Moving Tail

Rear Warning Antennas

Wing Glove - On the real aircraft there is a very well defined slit line where the wing moves. On the model its not so well defined, but it doesn't really spoil the effect when the wing is moving.. Immediately behind the nose undercarriage bay is the bomb bay which has two doors each having a 'V' shaped front profile. These doors also hinge in the middle giving ground clearance for ordinance loading. (*See screenshot*) The 'V' profile allows for large free fall nuclear weapons to be carried. The bomb bay doors are animated via 'Shift + E3'. There animation is smooth and linear. The door actuating mechanism at the rear of the bay is also animated. Internal bay detail is good, created using textures and some structure for the ordinance mounting and door actuators.



A short distance behind the bomb bay is the belly anti-collision light which is nicely modelled (See left) and has a reflective texture. Next moving aft is the main undercarriage bay which will be discussed later. Further aft between the engine exhausts is a fairing for the arrestor hook.

Also in this fairing is the tail skid which extends/retracts along with the undercarriage. The hook fairing covers all but the hook end, and when the hook is selected 'Shift +Q' the fairing opens in the form of two doors, and then subsequently the hook is extended down with the doors staying in an opened position. The

arrestor hook is simply modelled and textured. On each side of the rear fuselage just on the curve from the belly to the side fuselage is a strake.(*See right*) Moving upwards between the two engine exhausts is a titanium section which is



very nicely modelled and textured. At the rear base of this section is the Fuel Dump Valve and outlet. (See left) On the outboard side of the engine exhausts on both sides is a fairing which contains ECM antennas. This fuselage fairing is also the point at which the All Flying Tail actuation and pivot system are housed. (See Main Screenshot Left)

Forward of this fairing on the top section of the side fuselage is the wing glove, the object of this device is to seal the opening into which the wing folds when the wings are extended or partially extended. The real aircraft has a well defined slit in this glove where the wing moves, but on the model its not so well defined.

Moving onto the top surface of the fuselage the shaping as with the rest of the fuselage is well defined and very smooth. Moving forward from between the exhausts is the joining area of the vertical fin. The joint is smooth and linear with no bleeding or mesh issues. The front of the fin has a spine running along the top of the fuselage of approx. 2 meters in length.

Forward of this in line with the front of the wing is the upper anti-collision light, it is the same as that modelled on the belly. On each side of the light there is a well defined grill which is part of the model and not just a texture. From the light and grills we move forward towards the jettisonable cockpit module, but before reaching that we encounter a VHF antenna and then the air to air refuelling port panel. This is a closed panel which is opened when refuelling is required. The panel is animated in the model via 'Shift +4'. The animation is smooth and the detailing of



Animated air to air refuelling panel is well detailed.

the panel is very nice with structure and textures. (See left).

There is an IFF antenna just before the jettisonable cockpit module. The modelling of the jettisonable cockpit is very well defined with nice smooth curves, good



canopy structure with good glass tint and reflection effects. Winas :

The wing structures of these F-111s are very well modelled, with smooth profiles and curves. Obviously the unique feature of this aircraft is its sweeping wing. In order to accommodate the full forward position at the inner leading edge of the wing root there is a spilt glove vane which opens when the wings are in the extended position and acts as an aerodynamic fairing when the wings are fully back. The wing of the aircraft has leading edge slats along with full width doubled slotted fowler flaps. The aircraft employs spoilerons and an all moving tail for controlling the roll axis of the aircraft. Detailing of the wing includes, on the upper and lower surfaces, slat / flap tracks, actuators, fairings etc. which are nicely done. Also on the wing tip are the navigation lights and formation strip lights which are nicely modelled. All animations of the wings and surfaces are smooth and linear, though the spoilerons seem quite rapid in their movement.

The wing structure extends from the front of the moving root leading edge glove vane to just behind the cockpit. (See right) There is a secondary navigation light located part way along its length and an intake pressure probe on the lower surface.

Engine Intakes and Engine Bay Cowlings :

The intake of the F-111 which was later fitted to all models is that which is known as the Triple Plow I intake and blade. This was the final version in the development of the F-111 intake which had many issues on earlier models of the aircraft. This intake is well modelled on the aircraft in this package, including the blade, cone and intake shape. Inside the intake are fitted guide vanes for streamlining the airflow into the compressor of the engine. These are also modelled, along with an animated bitmap depicting the engine compressor.

Depending on the variant there are also either three opening auxiliary intakes doors on the forward outer edge of the intake or the intake itself slides forward as an auxillary intake door. The animation of these is smooth and there is no bleed around the doors when closed. The position of these doors is dependant on power settings.

The cowlings that cover the engine intake and later the engine itself are well modelled and in reality are part of the lower fuselage structure. Non of these panels can be opened.

Engine Exhausts and Nozzles :

The Engine exhausts and nozzles are beautifully modelled and animated, with both the inner and external nozzle parts moving dependant on power settings. On full power the afterburner effect is to say the least very realistic with a well defined cone coming from the rear. The nozzle leaves are very well modelled and the textures are brilliant. The detail inside the nozzles is also very good with the burner ring being visible and well textured.

All moving tailplane :

By having sweeping wings the aircraft couldn't have ailerons in the conventional sense, therefore the aircraft employs an all moving tailplane for pitch and roll axis control. The all moving tailplane is a simple surface with the addition of static wicks and a small trailing edge cowling on each for the rear warning system antennas.

Vertical Fin & Rudder :

The large vertical fin is well modelled with a smooth profile, and the area where the fin joins the fuselage has a good line with no bleed. The rudder is simple and has small movement for yaw control. It also has two static wicks on the upper trailing edge. On the Raven the large bulbous antenna housing is very well modelled with smooth shaping, and has a rear position light. The other models have at the top trailing edge of the fin, a bullet



housing for an IR scanner and a rear position light.





Another unique feature of this aircraft is that it uses the main undercarriage door also as a speed brake. Interesting concept

Here is a dusk shot to show the nav light and formation lights, but also there can be seen better details of the top flap section, and the side mounted antennas which only appear on the Raven model.









Undercarriage :

The undercarriage of the F-111 is slightly unconventional as both the nose and main gears are on the aircraft centerline. The main gear is of a heavy construction which when extended has its wheels sitting just outside of the fuselage side profile. The main gear is very well detailed as is the main landing gear bay, which has very nice texturing as well as the actuation devices, piping and structure. Animation of the main gear is very nice with the main gear being pulled inwards before being retracted forward into the bay. All animation is smooth and sequential, being very similar to the real aircraft retraction / extension, very well done indeed.

The nose undercarriage has been given the same treatment, detailed mechanism, bay, texturing, and animation.

Cockpit :

The cockpits of these models are to say the least exceptional. With five dedicated panel layouts, beautiful instruments, control panels, consoles, HUD etc. this has to be among one of the best panel representations I've seen for a while. The gauges are very well reproduced with the effect of depth between the glass and the indicating plate. The resolution of the gauge textures is very high with almost no blurring even at maximum zoom. A great many of the systems have functionality, but due to the limits of FSX, there are too many options that the basic simulator cannot handle. The supplied user manual gives a good clear insight into the working aspects of the instruments, switch panels, HUD, and other equipment within the cockpit. It would be difficult to detail all in this review therefore during the flight test we shall be looking at the basic aircraft functionality and flying characteristics, leaving the detailed use of the systems for the user to discover. As for the structure of the cockpit, it is also very well modelled and detailed. The canopy frame is structured with a lot of detailing right down to the air vents, handles, piping, air ducts and canopy actuators, all are very well modelled and textured. The side wall structures of the cockpit, side consoles, center console, rear center console, control stick, instrument panel cover, standby compass, and even the crew seats are all modelled to a very high standard, including the texturina.

The only part which is a very, very small negative in the cockpit is the rear view mirrors which do not appear to change or show anything. They are always sky blue, even when flying through thick cloud and rain.

There are four or five cockpit views available depending on the aircraft selected.

Also available on the panel are some sim hot spots which allow you to get quick access to, view control stick, view kneepad, view map, view radio stack, view ATC window, and view GPS. The external stores can be jettisoned but this is not animated. There is a jettison switch on the left hand corner of the cockpit which simply removes the external stores.

All in all an excellent cockpit and panel combination.

Exterior Textures :

This package comes with eleven very high quality 2048 x 2048 liveries depicting aircraft from the USA and Australia. Attention to detail in the texture set very good. On the model itself it is almost impossible to find any texture distortions, stretching etc. All seem to have been very finely tuned to blend exactly with the part that they are to adorn. Another very small negative point with the package is that in all areas the textures are just too clean and could have benefitted from some weathering and staining especially the landing gear and bays, they are just a too clean when comparing the models with their in service big brothers. But in saying that you won't see many better texturing sets than this one, even if they appear to be factory fresh. Top marks for textures.

Exterior Lighting :

As we discussed before the navigation lights are very nicely reproduced on the wing tips as are the rear position lights. We forgot to mention that the second set of navigation lights on the wing root structure from the forward wing glove vane to the fuselage behind the canopy part way along its length are only used when the wings are folded back and is automatically controlled by wing position. The wingtip formation lights are not effected by wing position.

The aircraft has three landing / taxi lights located on the front undercarriage. The lights are well defined and textured with a reflective lens effect though at night they appear as only as small points of light, which is rather disappointing as the navigation lights shine brighter.

The aircraft possesses various formation lights on the wing tip, forward and rear fuselages, vertical fin and also on the upper fuselage surface. These are controlled by a separate cockpit switch on the lighting panel located on the rear center console.

External loads / weapons :

The F-111 models come with different variants and also different weapon loads. The F-111 can carry an amazing amount and variety of weapons and other stores such as jamming and datalink pods, ejector racks and fuel tanks, many of which are featured on the models in this package. The loadouts cannot however be randomly chosen as they belong to whichever model they are present on, although they can be toggled on/off using the weapons jettison button on the left side of the cockpit main panel. Toggling off will not affect the payload weight or CG position, it is merely a visual feature. All weapons and associated pylons etc. are very well modelled, with excellent detail and texturing. Information on weapons will appear on the final page of this review.

Sounds, Documentation and Extra Effects :

The sound set for this package has been produced by Turbine Sound Studios who are renowned for the quality and realism of their soundsets, and in this package they have done just that. The soundset is brilliant in all aspects, internally and externally. From engine sounds on startup, to taxi power, throttling up to full power and the afterburner, all are great.

Not just the engines but all sounds are convincing, and really realistic. Canopy opening, Wing movement, IFR panel opening, bomb doors, undercarriage, wind and even rain effects are all top notch.

There is smoke effect on engine start up. The afterburner effect as mentioned earlier. There is also a custom fuel dump effect from the rear fuel dump valve which is controlled from inside the cockpit. Though the best effect is the fuel dump and burn effect, *(See main Screenshot)* this is achieved by pressing keystroke 'i', so if you want to duplicate an Australian F-111 flying display you can do it. The fuel dump selected from the cockpit reduces fuel content, but dump and burn doesn't, so can do it as many times as you like, how cool is that. The dump and burn effect is excellent and very effective when viewed from a distance to be able to appreciate the length of the flames.

Documentation supplied with this add-on is a sixty-four page user manual. Within this manual is an introduction, installation guide and then information on the instruments, panels, systems and operation of various of the equipments and a quick start flying guide. The information supplied is sufficient for getting you familiarized with the aircraft and systems but sadly it is not very comprehensive and lacks performance charts etc.

Flying the Virtavia F-111 :

We will be making our flight from RAF Lakenheath in Suffolk, England. Where the F-111F was operated up until 1992. Fortunately within this package is a Lakenheath F-111F of the 48 TFW squadron serial 702390. For this flight test we used an original copy of an F-111F Pilots Operating Procedures which we purchased on the Internet. After carrying out an exterior pre-flight inspection we climbed aboard and settled into the internal security and pre-start checks.

After completing these checks we moved on to the before starting engines checklist and subsequently the engine starting checklists. With both engines started with ground idle at 60% of rpm, and the before taxi checklist completed we were ready to taxi to the holding point. Opening the throttles to 70% of rpm we started to move and with that rpm we taxied at a good speed without having to apply too much braking. Whilst taxiing we carried out the before take-off checklist and on arrival at the hold are given permission for take-off. Lined up on the runway we are ready to roll. Wing sweep for take-off is 16° with flaps at 25°. Nose wheel steering is recommended up to effective rudder control at approx. 50-70 KIAS. The rotation speed in the manual suggested for our weight a rotation at 150 KIAS. Opening the throttle to the T/O position we released the brakes, and with a rapid acceleration we soon reached the suggested 150 KIAS. A gentle pullback on the control stick we were soon in a positive rate of climb and accelerating to 200 KIAS. We retracted the gear and at the same time reduced our power to 90% rpm as recommended in the manual to maintain an airspeed of 260 KIAS in the climb with an ROC of over 4,000 ft/min at 10° pitch up.

We soon reached our initial desired cruise height of 30,000 ft and engaged the autopilot AS (370 KIAS), Alt (30,000 ft) &

Our Lakenheath based F-111F that we used during our test flying see burning. Just look at the detail of the fuel vapor and the flame e





HDG hold. The autopilot works as advertised controlling all selected items. We then disengaged HDG hold whilst keeping AS & ALT hold engaged and made some manual rolling to the left and right using the control stick and got good responses from the controls. The max roll input that we made was 30°. The autopilot maintained AS & ALT hold during these maneuvers. We subsequently disengaged AS & ALT hold and made a 20° climb at 90% rpm which reduced our airspeed back to 320 KIAS. Levelling out at 40,000 ft we re-engaged the autopilot in AS & ALT maintaining level flight. Next we climbed to our supersonic cruise height of 66,000 ft at which we should be able to fly at Mach 2.1. During the climb with afterburner our airspeed was 450 KIAS at over 5,000 ft/min at a pitch of 20°, on levelling out at 66,000 ft we engaged AS, ALT & HDG hold. Mach 2.1 at supersonic cruise height is that which is recommended in the flight manual at 80% rpm. We therefore tried disengaging AS hold and set the rpm to 80% to see the maximum airspeed that we could achieve in level flight. After a few minutes the speed stabilized at Mach 1.85 well below that stated in the manual.

After disengaging the autopilot we trimmed the aircraft with afterburner engaged until we reached Mach 2.1, subsequently pulling back on the throttle to disengage the afterburner, but were still indicating 100% rpm. After stabilization in level flight at 66,000 ft we could only get Mach 2.05 and were using a lot of fuel burn at 100% rpm, as stated above if you set 80% rpm you can only achieve Mach 1.85 to Mach 1.87.

OK, with regard to maneuverability at these airspeeds, it is



with no appreciable difference in roll or pitch rates. This puppy flies well at all airspeeds and altitudes.

Next we tried to overspeed the aircraft, nose down with full power until the simulated warning came on at Mach 2.2. Making a descent to 20,000 ft we slowed the aircraft down to see at what speed we would get a clean stall. It took some time but it actually happened in the simulation at 117 KIAS. We then did a full flap, wheels down dirty stall which in the simulation occurred at 112 KIAS, so there wasn't a big difference between the two stall speeds. The aircraft shows no adverse reaction to the stall e.g. wing dip etc. Recovery was simple with nose down and level wings, applying power to level out the stall and recover. After the stall tests we descended to 10,000 ft for some slow speed maneuvers prior to returning to the field. At an airspeed of 220 KIAS we carried out pitch and role maneuvers to compare with the higher airspeed maneuvers carried out earlier. Control of the aircraft was similar in its characteristics to the earlier test except that the rates were slower and there was less tendency to over control especially in a turn. The same as for the high speed inputs, they were easier to anticipate and control after flying within the regime for some time as you became accustomed to the aircraft's responses.

One final thing to do before returning to base and that was to carry out the fuel dump and burn to see if it effects the aircraft. I've always wanted to do that after seeing an RAAF F-111 doing it at an air display. So at level flight 10,000 ft at 300 KIAS we carried out the dump and burn and there was no significant difference experienced in terms of handling or airspeed. So with the fun over it was back to base for an approach and landing.

Entering into the circuit at 300 KIAS with wings swept for landing we descended towards the downwind leg controlling our airspeed with speed brakes and power as necessary. Turning downwind we extended the landing gear, slats and set our flaps to 15° whilst reducing our airspeed to 250 KIAS. On starting the turn to finals we selected full flaps and adjusted our approach speed to 180 KIAS before lining up with the center line with a 10° ARA at approx. 300 ft. Crossing the threshold and maintaining the rate of descent the aircraft eventually entered ground effect at about 30 ft above the runway, this causes a slight nose dip which must be controlled until touchdown of the main wheels with the runway is established. Upon contact allow the main wheels to settle before lowering the nose of the aircraft. Whilst applying the brakes we pulled back on the stick to achieve aerodynamic braking from the all moving tailplane. Ground roll spoilers will automatically extend. Maintaining directional stability with the rudder and differential brakes until approx. 50 KIAS at which time the direction is maintained using the nose wheel. Once the aircraft had decelerated below 20 KIAS we were able to taxi off the runway and return to the dispersal. On leaving the runway the post landing checks were carried out before parking at the dispersal, where the engine shut down procedures were effected and the aircraft fully shut down and we deplaned. Total flight time 2 hours 55 mins.

External loads and Weapons :

GBU-10, GBU-12 and AIM-9P :

The GBU-10 Paveway II is the 2,000 lb Mk.84 general purpose iron bomb with a laser seeker head and guidance fins added. This turns the 'dumb' bomb into a 'smart' bomb which is guided to its target by airborne or ground-based laser target designation. This is the larger of the bombs shown in the foreground in the first picture on the next page. The GBU-12 Paveway II is the smaller, 500 lb Mk.82 GP bomb, fitted with the Paveway II kit as described above. The AIM-9P is an advanced version of the Sidewinder infra-red air-to-air homing missile.

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The horizontal ejector racks added to the outer pylons give the F-111 self defense capability.



Mk.82 500 lb bombs :

The Mk.82 is an unguided, free-fall bomb, usually carried on the F-111's Multiple Ejector Rack in two groups of three per rack. Two racks per wing are often carried, providing a devastating fusillade of explosives onto the target.



Mk.82 Snakeyes :

The Snakeye is a normal Mk.82 500 pounder, but with a high-drag tailfin unit which automatically deploys when the bomb is released. This retards the speed of the bomb, allowing the aircraft more time to pass over the target before detonation, which allows delivery of the bombs at a much lower altitude than normal Mk.82's.



GBU-15 and AXQ-14 Datalink Pod :

The GBU-15 is a 2,000 lb Mk-84 free-fall iron bomb with forward and aft steering fins and TV or infra-red guidance system on the nose. Signals are sent to the bomb from the AXQ-14 Datalink Pod, which is usually mounted aft ventrally on the F-111. The system enables the bomb to glide to its target, either as fire-andforget with automatic guidance once the target has been set, or guided manually by the copilot.



AN-ALQ 131V ECM Unit :

This electronic countermeasures pod provides the F-111 with the ability to jam and disrupt enemy ground and airborne radars. First used in the 1970's, it remains one of the most successful ECM systems ever made.



AGM-84 Harpoon :

This versatile radar-guided anti-shipping cruise missile can be used by aircraft, ships, submarines and land batteries. The F-111 can carry four at a time and they are fully fire-and-forget, skimming the sea at 537 knots for at least 67 miles.



AGM-69 Nuclear Stand-Off Missile (SRAM) :

Entering service in 1972, this missile was available in 17 and 210 kiloton versions and could be launched directly at the target or in a semi-ballistic 'toss' maneuver. In both cases the missile's own inertial navigation system would guide the single warhead to its target, with a maximum range of 110 nautical miles.



B61 Free-Fall Nuclear bomb :

Developed during the early 1960's, the B61 is a multiple yield weapon (0.3 to 340 kiloton) which can be carried externally at supersonic speeds. The F-111 can carry the bombs both on wing pylons and in its bomb bay. The weapon is still in the inventory today as the B61 MOD 11, a nuclear 'bunker buster'.



In conclusion :

In concluding this review it has to be said that Virtavia have put together another great package. The standard of the overall modelling is exceptional, the textures are well defined in high resolution with no stretching or misalignment. The sound set is great, as are the available effects, especially the dump and burn. The aircraft model flies very well with no big surprises in all envelopes of flight. The array of avionics in the cockpits were not fully tested in this review and have been left for the end user to find out the functions should they buy the product. Again as with all add-ons of such high quality it has a manual which

contains a good insight into the aircraft and its systems, but fails badly on check lists and procedures for fully flying the aircraft. When will developers realize that a good flight manual is just as important as a high quality model for us to be able to enjoy all the features of the aircraft. Putting this aside its difficult to fault the Virtavia F-111, and I will surely be flying it regularly. An excellent add-on worthy of its awarded rating. Congratulations Virtavia!

Available now by direct download: http://www.virtavia.com

Price : EUR 29.45 download

Technical Requirements : Recommended Flight Simulator X (Acceleration, SP2) no technical specification given.



