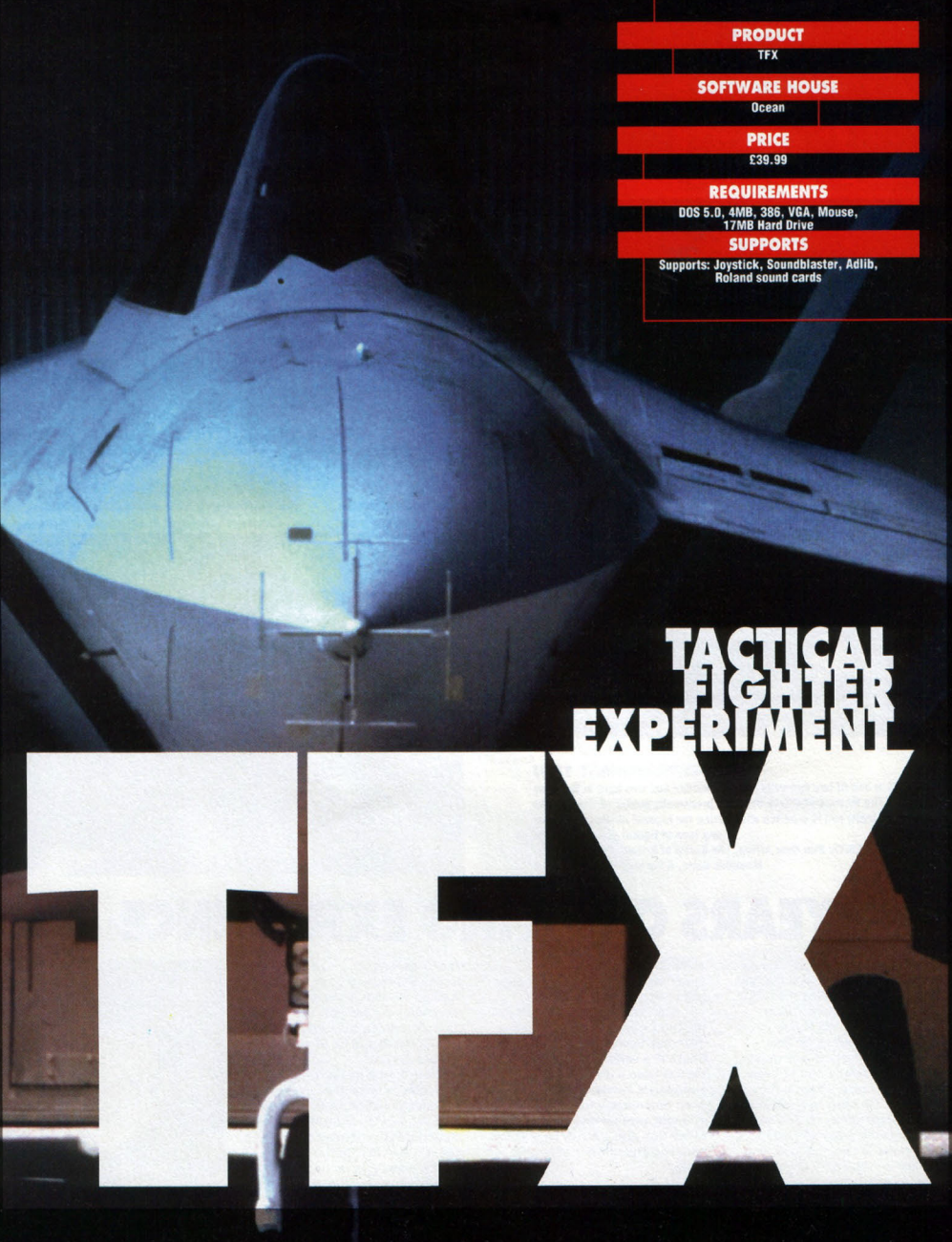




PAGE 26

THE NEW  
by  
AGE OF  
John  
FLIGHT  
Davison  
SIMULATIONS  
HAS WELL  
AND TRULY  
ARRIVED.  
COULD TFX  
BE THE MOST  
EXCITING  
COMBAT SIM  
YET?



**PRODUCT**

TFX

**SOFTWARE HOUSE**

Ocean

**PRICE**

£39.99

**REQUIREMENTS**

DOS 5.0, 4MB, 386, VGA, Mouse,  
17MB Hard Drive

**SUPPORTS**

Supports: Joystick, Soundblaster, Adlib,  
Roland sound cards

**TACTICAL  
FIGHTER  
EXPERIMENT**

**TFX**



# DESPITE

the fact that many of today's modern flight simulators concentrate on fictional scenarios set in the near future, it's rare to find something which seems to be an accurate simulation of the future of actual aerial warfare. As the world begins to be gradually unite, it seems inevitable that the United Nations and its forces will become the arbiters of global security. With this new age, contemporary weapons and vehicles will come to the forefront, and it's these which TFX centres its attention on.

TFX (Tactical Fighter Experiment) is a product which has been unleashed amongst much hype and numerous boasts, but can a fictional simulation really deliver both the thrills, spills and technical accuracy provided by Falcon 3.0 or Tornado?

This game is based on three fighter aircraft which are at present at the very leading edge of modern technology. Of the three aircraft simulated, only the F117a Stealth Fighter has seen active service, but all three are considered to be highly classified by US and European governments alike. So how does a development team go about accurately portraying something which has had so very little published about it?

Virtually all simulations are based on current or past aircraft, and the developers are able to research various aspects by consulting works published by the vehicles' manufacturers. TFX's developer, Digital Image Design (DID), was forced to take a completely different route. With the assistance of its aeronautical engineering consultant Roderick Victor Kennedy, the team created mathematical models of the aircraft using the sparse amounts of available data. Wing shape, weight and other characteristics (provided by EFA and F-22 test data which cost the team an absolute fortune) were used to calculate lift, drag and other aerodynamic performance parameters. The results may not be authentic, but are as realistic as possible.



## EUROPEAN FIGHTER AIRCRAFT (EFA)

Companies from the UK, Germany and Italy formed Panavia in the 1970s to develop the Tornado. The lack of a dedicated fighter has led to the adaptation of the Tornado into the Air Defence Variant (ADV), however the Panavia partners saw in 1982 that there was still a requirement for a high speed, dogfighting vehicle and thus proposed the Agile Combat Aircraft (ACA), a canard-configured aircraft.

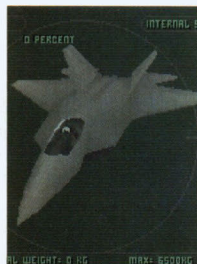
This project was dropped in favour of the European Fighter Aircraft, a vehicle intended to be introduced into active service in the late 1990s. Dubbed the F-16 Plus, the Eurofighter is in the same weight class as the highly successful F-16 Falcon



## LOCKHEED F117A STEALTH FIGHTER

Developed by Lockheed and funded by the Defence Advanced Research Project Agency, the Stealth project (code-named Have Blue) was initiated in the early 1970s. The first Have Blue prototype flew in 1978 whilst the second, equipped with RAMs (Radar Absorbent Materials) was tested against captured Soviet weapons in 1978. The first full-scale F117a flew on June 8th 1982.

The F117a was designed to be almost totally invisible to radar, but its unusual shape makes it extremely unstable in the air. To address this problem the vehicle is equipped with the same GEC flight control system (fly-by-wire) as used in the F-16 Falcon



## LOCKHEED F-22 SUPERSTAR

In the early 80s the Reagan administration required work to begin on what was called an Advanced Tactical Fighter. The ATF was to be a counter air fighter with supersonic cruise and Short Take-Off Landing (STOL) capability. Originally intended purely for the USAF, in 1986 the US Navy agreed on specifications for a naval ATF as a replacement for the F-14.

The F-22 is the USAF's largest fighter yet, with a 78m2 wing area. All of the vehicle's weapons are carried internally for stealth reasons. Worthy of note in the plane's overall configuration is the fact that there are no vertical surfaces – this is to ensure that the aircraft is as invisible to radar as possible

All the vehicles in TFX are high-performance jets which have had enormous amounts of both time and money invested in them. The EFA and the F-22 are yet to fly in active service and much of the information regarding the F117a Stealth vehicle is classified

# THE UNITED NATIONS

With the UN in the news so frequently these days, it's fitting that the organisation's role as world police force be portrayed in a game about aerial

court martial, dismissal and ridicule in the world press.

In terms of play area, TFX is one of the more impressive combat sims to hit the market in recent months. Almost five million square miles of scenery has been carved up between the game's five different scenarios and all of this

**THE UN CHARTER:**  
**"TO MAINTAIN INTERNATIONAL PEACE AND SECURITY AND TO THAT END TO TAKE EFFECTIVE COLLECTIVE MEASURES FOR THE PREVENTION AND REMOVAL OF THREATS TO THE PEACE, AND FOR THE SUPPRESSION OF ACTS OF AGGRESSION OR OTHER BREACHES OF THE PEACE, AND TO BRING ABOUT BY PEACEFUL MEANS ADJUSTMENT OR SETTLEMENT OF INTERNATIONAL DISPUTES"**

warfare in the near future. This game places the player in the position of a peace envoy in the UN Air Force and poses all of the limitations that a real operative would be placed under.

The force's primary role is to patrol the areas and uphold peace – pilots may not engage the enemy unless fired upon, and then targets are only designated in order to remove a threat to the peace. Failure to comply to these basic rules of engagement results in

land has been accurately reproduced from Ordnance Survey data on the areas. Each scenario is both geographically and topographically correct and all cities, rivers and major landmarks are in their correct positions within the virtual world that has been created. A novel touch is that this model is updated as you continue with the game – whatever you destroy during your tours will remain destroyed until your particular pilot has been killed. ➤

Transition between the different views is far more movie-like than in other games. Views never simply switch from one to another, there is always a zoom effect in or out of the cockpit. Anyone who has played Virtua Racing in the arcades will have an idea of the style of effect



**REV  
IEW**

## TESTING TIMES IN THE LIBYAN FLASHPOINT

The flashpoint scenarios offer a sort of soap opera campaign mode which is very similar in style to the cut scenes in Strike Commander. In all there are five flashpoint tours, each covering one hot spot.

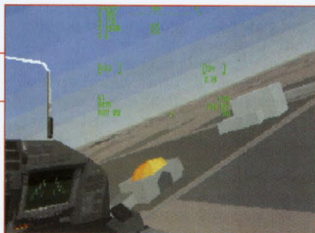
The Libyan flashpoint places the world on the brink of nuclear war as Ghaddafi refuses to allow UN inspectors to examine an arms depot which is suspected to contain nuclear weapons. Upon arrival in the Mediterranean, the UN fleet is threatened by aerial activity and requires assistance from a local UN EFA patrol...



The EFA is scrambled with a brief to intercept a suspected spy plane heading towards the UN task force fleet. Taking off from a neighbouring base, it should only take a few minutes before interception



Before encountering the suspected spy plane the EFA is confronted with resistance from Libyan owned F-15 fighters. Once the threat has been established, AWACS gives permission to engage



Could this really be the spy plane threatening the UN task force? AWACS insists that you engage, but surely a civilian airliner can't be a threat?



➤ It's worth mentioning the enormous variety of weapons available here as well. Although many recent products such as F-15 III and AV8B have included a decent spread of destructive devices, it wasn't until Tornado hit the shops that the more advanced modern equipment was really simulated. Like DI's awesome sim, TFX allows the use of a variety of both interdiction and air-to-air weaponry, much of which wasn't made public before the conflict in the Gulf. Laser-guided GBU's which can be aimed from nearly 200 miles away, CMB 18 runway fragmentation bombs (the flashy ones that have their own little parachutes), Mavericks, AMRAAMs and anti-radiation weapons are all present, along with all the usual stuff you'd expect to find such as sidewinders and the trusty old cannon.

As far as mission areas go, this game is far more original than most. All five of the world trouble spots portrayed are not only of direct concern to the UN, they are also very topical. Firstly we have the obligatory 'Arab General with far more weaponry than he ought to have' scenario (In this case it's Ghaddafi – the naughty boy is stockpiling nuclear weapons in Libya.), then the civil war in Yugoslavia as the UNAF steps in where David Owen has previously failed. Next we have the conflict in Somalia, the problems posed by the all-powerful drug barons in Colombia and finally an original scenario based in the south Atlantic as the world battles for rights to oil found off South Georgia. Each of the scenarios includes objectives which range from basic interception to air superiority, defence suppression and close air-support tasks.

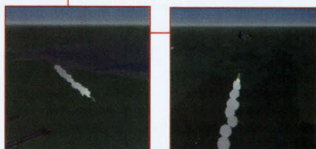
The five groups of missions can be played in up to six different ways, offering many engrossing hours of play. Missions can be played either singly from within the basic simulator, within a 10 part training scheme, as part of a tour of duty which takes you through all of the objectives in each area or even as an arcade game where you are simply flying around trying to shoot things down for points. In this arcade mode the laws of physics are screwed around with somewhat and the game is purely for entertainment. The flight model is reduced to virtually nil and you are provided with an infinite stash of weapons and fuel.

The two most interesting and original options on offer are the UN Command

**"ALTHOUGH MANY RECENT PRODUCTS SUCH AS F-15 III AND AV8B HAVE INCLUDED A DECENT SPREAD OF DESTRUCTIVE DEVICES, IT WASN'T UNTIL TORNADO HIT THE SHOPS THAT THE MORE ADVANCED MODERN EQUIPMENT WAS REALLY SIMULATED"**

system and a tour of duty option referred to as flashpoints. In UN Command a basic mission editor is provided which allows you to choose all of your objectives and any of the game's landscapes. For more details on this, take a look at the Mission Building sequence of shots. It may not be as comprehensive as the incredible system in DI's Tornado, but it provides a way of lengthening the game's appeal.

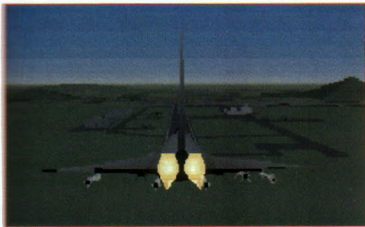
The views of the missiles can be manipulated as much as the planes. You can switch to a missile camera, pan around the outside of the missile and track it all the way to the target



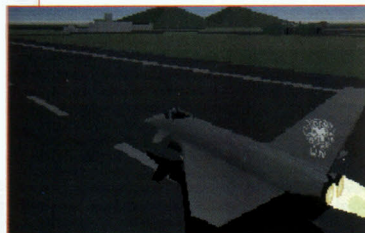
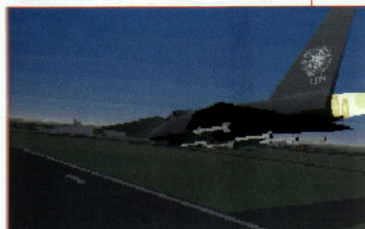
Flashpoints are a group of missions described by DID as a form of soap opera, in which you fly your tour of duty with an overall theme. There are a total of five flashpoints on offer, one for each of the hot spots. Each adopts an overall story which your missions will play an

active part in – if you've played Strike Commander or Wing Commander you'll have a good grasp of the general idea involved.

In the disk version you simply get bits of text with faces mouthing the words to you, however we're assured that in the CD-ROM version (available next month) there will be an awful lot of sampled speech, all lip-synched to the graphics.



The autopilot in TFX is capable of numerous tasks from basic navigation to actually landing the plane back at base



## MID-AIR REFUELLING

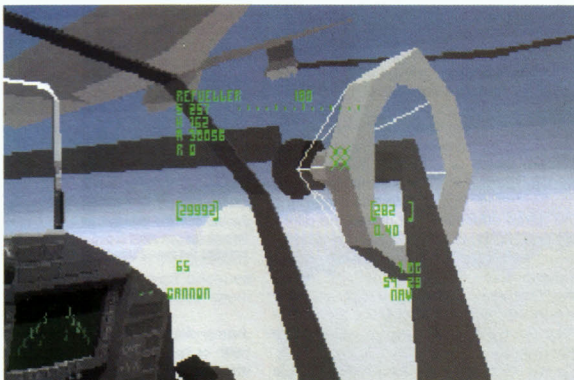
A new feature which is becoming fairly trendy in modern sims is the implementation of in-air refuelling. The three planes in TFX behave quite differently and you have to employ different methods for each in order to get that damn fuel hose into the right place.



Both the F-22 and the F-117a incorporate a revolutionary fuel probe method. The pilot simply has to fly close enough to the refuelling vehicle for a probe to be lowered and attached to a point midway along the plane's back



Keeping the EFA in position takes considerable practice, but once the method has been mastered it can be performed quite quickly. Simply fly within range and then alter your heading very gently until contact is made



The EFA uses the more traditional method of mid-air refuelling. An interface unit is extended from the side of the fuselage and this must be guided into a funnel at the end of the fuel pipe



TFX is one of the only combat simulators around in which you actually see both the chaff and flares as you launch them. As far as we can remember, only Microprose's original F-19 sim produced a similar effect

## AS REAL AS IT GETS? THE MOST ADVANCED FLIGHT MODEL EVER?

The game offers a total of four different flight models. Firstly there is the previously mentioned arcade model which basically allows for flight and that's about it. Next we have the simple model which does employ certain rules of physics but is still tremendously forgiving. There's a model that's described as being 'realistic', which matches something along the likes of Falcon or AV8B, and finally the military flight system.

This final model is only really available to 486 users due to it taking all kinds of factors into account as it presents your view of the outside world. Whilst other simulations may pay a passing nod to the effects of the weather, weight distribution and fuel load, the military model in TFX

calculates the performance of the aircraft based on everything from temperature to the location of weapons on the pylons. The calculations required for such a monstrous task seriously eat processor time and if you want to use this fully-

**"IF THERE WERE EVER ANY REASON TO JUSTIFY GOING OUT AND BUYING THAT EXTRA 2MB OF MEMORY YOU'VE BEEN PROMISING YOURSELF, THEN THIS IS IT"**

fledged flight model you really need a 486 DX33 or preferably higher.

Whilst on the subject of processors, it's worth pointing out at this point that although Ocean and DID claim the game will run on a 386 with 2Mb of memory, but we found that this is not the case. Our test revealed that although even a 386SX 25 managed quite ably with the realistic flight model, if you had anything

less than 4Mb the game was rendered unplayable. Why were such claims made then? DID has employed a clever virtual memory system which decompresses files into a 4Mb area of your hard drive ready for fast access. Unfortunately, the time taken to do this seriously cocks things up and on occasion we were waiting for up to two to three minutes for something to load!

Having said this though, if there were ever any reason to justify going out and buying that extra 2Mb of memory you've been promising yourself, then this is it. TFX is really quite an incredible game which not only looks absolutely superb, it also has a fluidity never experienced before in a PC combat game.

The 3D graphics engine used to drive this game is really quite astounding >

**REV  
IEW**

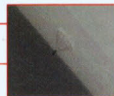


The clouds are far more realistic than those found in most other sims, actually taking on some kind of form. Constructed from numerous shaded circles, the impression of actually flying through the clouds is extremely effective



PAGE 30

and it seems to shift enormous amount of detail around the screen at a phenomenal pace. Take the transition between views for example – choose to go to the spotter plane and the view pans out from the cockpit to the rear of the plane so you can pan all around the vehicle. The view will then orientate itself correctly before zooming back into the cockpit. Ever played Virtua Racing in the arcades? The effect is very similar to that.



The eject sequence covers everything from the canopy blowing off to the parachute opening and the pilot spinning down towards the Earth

This fluidity is something which helps to create a level of excitement in a flight sim which I've never come across before. Everything seems to have an added degree of realism which helps draw you into the gameplay. Missiles leave a convincing vapour trail, clouds have proper form, countermeasures such as chaff and flare are actually visible, aircraft screech past you with their afterburners fully visible and all objects actually look like they're supposed to. This detail coupled with the phenomenal speed helps to produce a believable feeling of actually being there.

Worthy of particular note with regard to the presentation is the 'virtual cockpit' system which is a further development to the padlock view found in many modern sims. Switch into this mode and the game effectively simulates the pilot's viewpoint. To do this, both the cockpit view and the outside scenery move independently of one another to create the impression that you are actually inside the cockpit rather than sitting with your nose pressed right up against the window.

It's hard to find problems with a product which is so impressive, but there are a few things. The sound...it really is bloody awful in places. The samples of your cannon firing off into the distance or your AWACS buddies feeding you information are great, but the music is dreadful. I'm not that fussed about having a tune humming away in the background as I'm blasting bad guys, but the repetitive drone created by the Soundblaster was really quite

## MISSION BUILDING: TARGETS, SATELLITES AND EVEN THE WEATHER

To supplement the tours of duty and the five flashpoint scenarios, TFX also incorporates a mission builder very similar in style to both Falcon and AV8B. You can choose to fight in any of the five available scenarios and specify what will be both your primary and secondary targets.



There are numerous targets available – inform the flight computer which targets you are aiming for and all the info will then be downloaded to your autopilot



You can view every object in the game at this incredible level of detail



Using the mission editor is very simple. The game provides you with a check-list which you simply work through, one item at a time



To ensure that you have as much information on the area as possible, you can switch to an overall satellite view



Once all selections are made, the mission is created and sent to your flight computer



For the selection of individual targets you can zoom in and examine the map in greater detail



Once you have the required area on screen, you can switch the satellite to 3D mode so that you can view the area as it will look when you attack



Choose the weather conditions, the intelligence of the enemy and the abilities of the enemy pilots before scrambling your fighters

horrendous. Things didn't really improve with a better sound card – the crux of the matter is that the music is just plain badly written.

Another minor gripe is the fact that the best method of control appears to be the keyboard. Call me fussy, but I like to be able to throw a plane around the sky using a good old-fashioned joystick, and TFX is just too damn sensitive to allow for reasonable control in this way.

Aside from this I can find no reason not to heartily recommend TFX. It really is a gorgeous game which not only

looks good, but also manages to work on two levels – you can either take it seriously or you can simply treat it as a game. It manages to be just as impressive as Strike Commander whilst still working on comparatively slow machines. Try running Strike on a 386 and then sit it next to TFX on the same spec system and there's no competition. TFX only uses half of the hard drive space as well.

I know I've already practically admitted to wanting to make TFX my girlfriend, but it really must be said that this is well worth investing in. It may not be a fanatically accurate sim like Tornado, but the feeling of actually being a part of the combat is really quite breathtaking. Watching missiles slice through the air a few yards in front of your fighter is very exhilarating.

Although not ready in time to be in our Combat Sim Supertest, I have no doubts that this game would have scored exceptionally high in virtually all of the categories. It has the depth of Tornado with the style and speed of Falcon and the presentation of Strike Commander. **SCORE ★★★★★**



Of the three planes used in the game, only the F-22 is designed to be carrier based. As with all other aspects of the sim, the UN fleet is beautifully detailed as it slowly rumbles towards its final destination, and you can look around the carrier as you sit on the launch strip



REV  
IEW

Unique to TFX is the 'virtual cockpit' mode. Similar to the padlock view in Strike Commander, this option allows you to look all around the cockpit. However, unlike other similar modes in other products, virtual cockpit actually simulates the movement of the pilot's head. Move the aircraft and the cockpit moves independently of the outside view. The result is an effect which realistically gives the impression of being inside the cockpit



# EXPERT OPINION

**THIS** game strikes me as being pretty impressive. As far as looks go, the planes actually look like real planes and the graphics overall really are fantastic.

The views, while being nice to look at, do not accomplish very much. The missile view for example, is nothing more than a way for the programmers to show off new graphics techniques. Who really cares about being able to sit on the missile as it moves into the target - you can't do that in a real aircraft, so if anything this detracts from the realism.

As far as the flight model goes, there were a few things which I found a bit disturbing. For example, when you go into a turn the nose tends to drop just a little bit. If you roll on into a turn at about 30 or 40 degrees this really shouldn't happen. Admittedly, when you're in a real aircraft you do instinctively use a bit of back stick, however TFX tends to overdo this a bit.

Another place where I thought that the game slipped up was in its portrayal of wingmen. Quite simply, there aren't any! In reality, there would very rarely be an occasion where a fighter pilot would fly a combat sortie on his own. There would always be at least one other plane flying in formation to watch the lead man's back. Of course, in the stealth bomber the lack of wingmen is correct, but the other two planes would always fly in formations.

There is not a great deal of data floating around at present about any of the planes, but from what I've heard from pilots who have actually flown the EFA simulator, it does perform very well at



Mark Hanna is PC Player's resident flight combat expert. MD of the Old Flying Machine Company (see page 24), he has more than 17 years flying experience on aircraft ranging from Spitfires to Phantoms

high altitudes, and this is portrayed correctly in the game. The cockpits, although designed more from what the programmers think they might look like, also seem to be very good. In new jets, dials and gauges tend to be replaced with digital read-outs and again these have been included in TFX. Of course, no one knows for sure what they actually look like in any of the aircraft because they are all top secret, but it does seem like a fair approximation.

With all the views that the game offers I'd expect to be able to find something where you can look straight out of the top of the canopy - this is very important whilst dogfighting and without this you don't have a lot of freedom. You can adjust the vertical view a little in this game, and you have got that Virtual Cockpit thing - but it's not enough. I would have liked to see a top view incorporated, as this would make dogfighting a lot easier and more realistic.



Part of the thrill in playing TFX comes from the fact that everything in the game is visible. Here we can see a missile tracking in from the distance



Switch to an external view and you'll realise it's too late. What can you do now short of ejecting? An AMRAAM up the tailpipe isn't at all healthy



The game will track the burning husk of your fighter all the way to the ground. Try to eject at about 10,000ft or you don't stand a chance

## MARTIN KENWRIGHT TFX PRODUCER, MD OF DID



"We're not trying to create anything that's hyper-realistic, the only thing we're trying to emulate is the most incredible war environment and the most realistic flight model. As far as technical accuracy goes we've not been too fussed - we haven't really bothered about whether or not

you'd burn out a light-bulb if you left it on too long.

Flight models are usually produced from textbooks, this has been done from basic physics. We've simulated the planes from their shape in the world - their weight, mass and density. All of our findings came from recently published test results. When you consider that they haven't even built the cockpit for the EFA yet,

we're pleased how much information we've compiled.

The game itself was started on a beach in Lanzarote a year and a half ago, whilst the team began work about a year ago with coding taking about six months. The spec surprisingly hardly changed along the way. The model was developed from the engine used in Epic, in fact we can trace the code back to F-22 Retaliator.

The best machine to run TFX on really is a Local Bus system, 66MHz, 486 DX2 and I think that a lot of developers are starting to aim for this sort of level. There's an enormous difference just between the 486 systems that are available these days. We do take the most common format, in this case a 486 DX 33 and then we make allowances for 386 machines."

**REV  
IEW**