

The Making Of *Star Fox*

Welcome to my first *Newshounds* article of 2019-2020!

It's that time once again of a new school year, which means a whole new batch of articles to publish! There's a bunch of great articles that I've planned for this year, so before we dive into this article, let's recap which articles I published last year!

We started off the previous year with a *Q&A* about myself, where students could give me questions to answer! Let's say there were some interesting ones in there!

Christmas was approaching at a rapid pace and before the big day arrived, we delved into the history of Apple's iPhone and we realised how far technology has come since the late 2000's.

After that, we entered the construction site to delve into the deepest blueprints of Blackpool Pleasure Beach's latest rollercoaster *ICON*!

Finally, we all came as one to choose which article to be published next. We ended up taking look at the history of *Sonic The Hedgehog* at Alton Towers, which covered over a quarter of a century to produce!

Anyways enough rambling on, let's get the ball rolling!

Nowadays, gaming has come an extremely long way since its inception, but back in the '90's we were restricted in technology compared to what we have today.

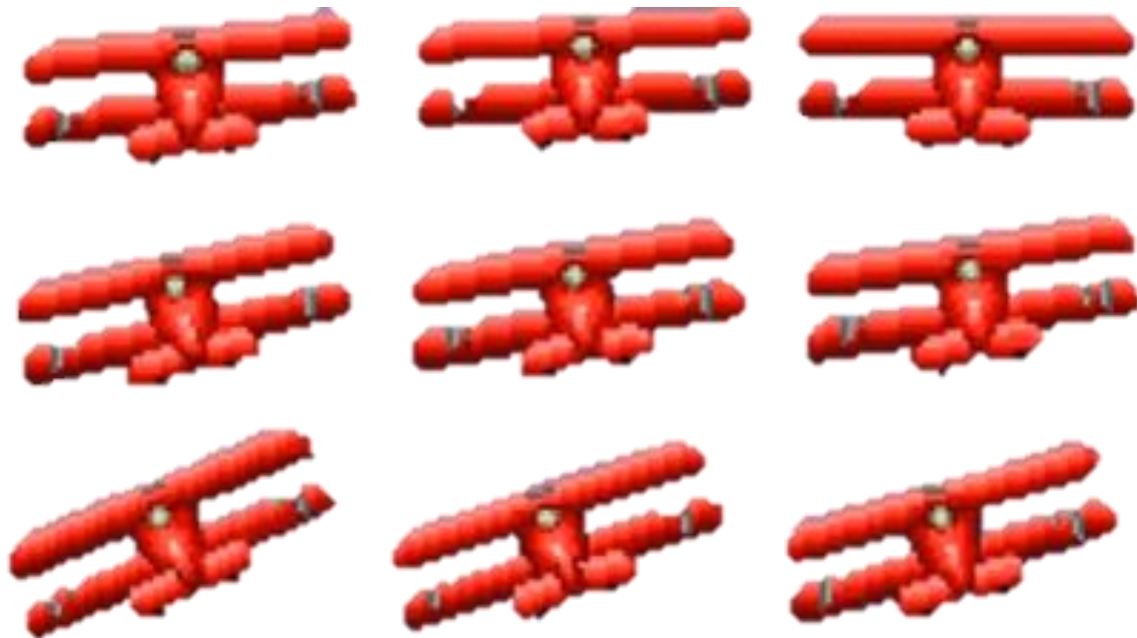
However, today we are going to look at singlehandedly **THE** game that brought the world of 3D to home consoles. Welcome to the making of...



WARNING: There may some terms that may be hard to understand. Please read on with this in mind...

The Beginnings...

It was the summer of 1990, and Nintendo's new 16-bit home console the SNES (Super Nintendo Entertainment System) was months away from releasing. With the new hardware that Nintendo developed for the SNES, they were able to create many more dynamic and new experiences, however even with the new hardware they still ran into many limitations. For example, *Pilotwings* had environments that simulated 3D (three-dimensional) but many sprites (these have to do with computer graphics) had to be drawn at different angles and this was very taxing on the hardware.



Meanwhile, the team had experimented with 3D polygons for the planes but they struggled to get them to run smoothly. However, it was around this time that a possible solution had presented its very self to Nintendo...

Enter Argonaut Games...

A developer by the name of Dylan Cuthbert had (at the time) dropped out of school to join the London-based company known as Argonaut Games to pursue a career in the gaming industry.



The company's founder, Jez San, had been obsessed with a technique in games known as 'Vector Graphics', which is a technique where lines are drawn on screen and move accordingly to simulate 3D graphics. Here's an example of the *Star Wars* arcade game using vector graphics:



Dylan Cuthbert soon worked on a 'tech demo' to use vector graphics on Nintendo's Game Boy handheld and showed it off at the Summer Consumer Electronics Show (CES) for the gaming trade in 1990.



Needless to say, Nintendo's representatives at the tradeshow were severely impressed at what Dylan had accomplished and around a month later, he was invited to Nintendo's headquarters to discuss 3D game development.

The Super FX Chip...

While discussing game development, an idea was brought to life about a possible chip that could be made to increase computing power and with some assistance from Nintendo, the production of the Super FX Chip began.



Alongside that, Nintendo bought the rights to Dylan's 'tech demo' in order to further develop it into yet another 'tech demo' for the SNES known as *SNESGlider*:



A short while after this, the Super FX Chip development kit was fully ready to be utilised...

Begin Development!

WARNING: Many complex terms will be used in this segment of the article!

Even though the Super FX Chip was very well suited for maths calculations, it still took **A LOT** of clever programming to output 3D models smoothly. The Super FX Chip would utilise code within the game to draw polygons on screen and compress them down to 2D data to run smoothly. The RAM (Random Access Memory) would be served as a frame buffer in an effort to store the results during the process of a frame being rendered. While doing so, the image is transferred to the SNES' Video RAM, Then the rendered image is combined with the 2D backgrounds and HUD (Heads Up Display) to end up with an image like this:



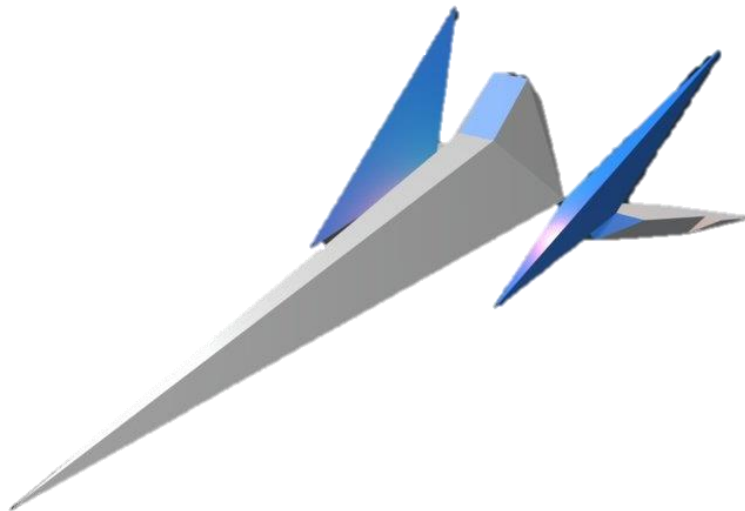
Here's a quick rundown of each layer:

Layer 1: Where the background is located and moves accordingly to the players' position.

Layer 2: Where all the polygons are drawn such as the Arwings, Buildings, Enemies etc.

Layer 3: Where the HUD is located such as Lives, Shield Gauge and Smart Bombs.

Fun Fact: The Arwings were named after they looked a lot like the letter A due to the limited processing power of the SNES and has retained the same design ever since with only some minor changes.



The original Arwing.

Cutting Corners...

However while doing this, the development team ultimately had to lower the resolution and had to mask a black border in an attempt to increase performance. Interestingly enough, levels were not rendered in chunks or as a whole; instead the development team went for a design choice where objects on screen were parts of scripted events. The team had managed to write a language that was easy to programme these scripted events for every level. For example, let's say you were at a certain point in a level and some buildings

would be loaded. The player's position would correspond to the movement of those objects and after they've left the screen they end up being unloaded. This was a great technique to save on performance.

Out of Hours...

Eventually, the development team would obviously need to take breaks from time to time, thus they frequently visited local arcades to help development on *Star Fox*. They ended up playing a lot of Namco Limited's arcade shooter *Star Blade* and ended up getting a lot of inspiration from it.

Fun Fact: *Star Fox*'s 'Space Armada' stage was a massive homage to *Star Blade*.

The Environments and Visuals...

Of course with any game, making good visuals was a major key to creating a unique world. However with the technology that was available at the time, the development team could only do so much to bring this world to life, as most of the technology was being used for the 3D models. For example, the game's first stage 'Corneria' has a colour pallet (which is the selection of colours that could be used) of dark green, bright reds and a slight blue tint on every object:



Meanwhile a stage like 'Meteor' would have a significantly darker colour pallet of black and dark grey:



Stages would also include a mild fog effect to help with 'pop-in' (a case where 3D models render unnaturally close to the player.) At this point, the game was building up its own unique world; however there was one core component that was still missing...

The main cast...

Shigeru Miyamoto, the creator of the *Star Fox* series, didn't necessarily want a complex storyline, but preferred to form a set of clear, distinct characters that would stand out from other Nintendo franchises at the time.

Miyamoto was also pretty much the creator of the *Super Mario* franchise. He stated: "Most of the Sci-fi in Japan back then was Robot anime, superheroes and monsters, but I wasn't interested in doing the same thing."

Miyamoto looked back at one of his favourite TV shows *Thunderbirds* and became the base for the main cast. Instead of humans, the team decided on anthropomorphic animals for the main cast. A sketch of a fox character was shown, which immediately clicked with the team and this was when *Star Fox* gained its own identity.

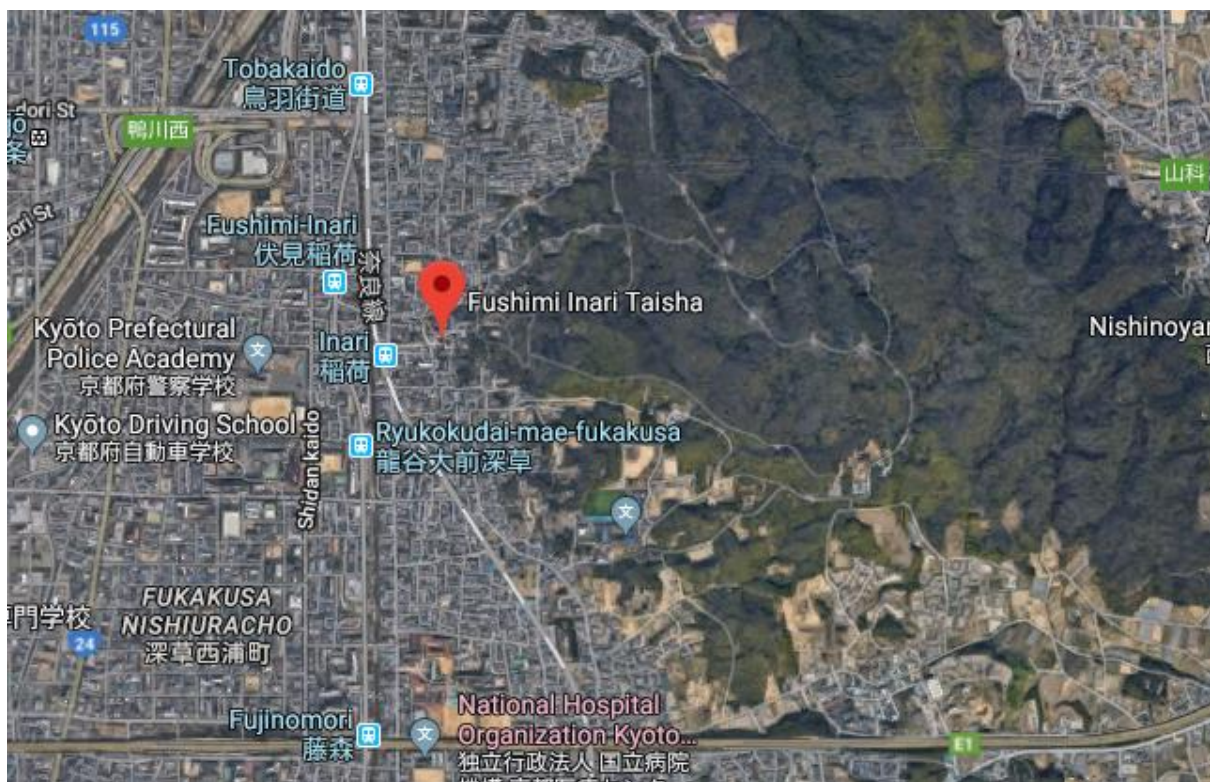


Fox Sketch

After this sketch was drawn, the character was refined to be the main protagonist of the series *Fox McCloud*.



The main inspiration for *Fox McCloud* was the Kyoto Fox shrine in Japan, which can still be visited!



Alongside that, *Fox McCloud* would be assisted by three team members while playing to help in missions and add a dose of comedy to play sessions.

These team members were also based from Nintendo's staff to fully flesh out these characters, which ended up creating *Falco Lombardi*, *Slippy Toad* and *Peppy Hare*.



Falco Lombardi



Slippy Toad



Peppy Hare

Coincidentally, this worked out very well, as many of the assets that were already in the game matched well with the animal theme, alongside a select number of assets that were from Argonaut's own *Star Glider* series. Everything was coming together really well but to add a cinematic flair to the game, but there was one more part to the game that needed attention...

The Soundtrack

The composer Hajime Hirasawa had created many audio samples that would fittingly go into the game with a cinematic score. He went in with the thoughts that he had owned the rights to the music and later on had worked on an arranged version of the soundtrack, but ultimately had to cancel the project once Nintendo caught wind of this. Legendary composer Koji Kondo would help with sound and audio samples, thankfully due to the limited pixel art on the cartridge there was extra free memory for more samples. There were also some cases of voice acting in some of the samples alongside dynamic changes in audio! Sounds impressive, doesn't it?

The Star Fox OST (original soundtrack) is often considered to be one of the best soundtracks in Nintendo history alongside being one of the most impressive, feel free to check out the OST via this link!

<https://www.youtube.com/watch?v=r1JYqmJU8oM&list=PLBB0872E167D5DB20>

(This also includes some of the scrapped arranged versions too.)

Production Wrap Up!

Within the final stages of production, the training stage was added and is a modified version of 'Corneria' with the same objects and colour pallet. Screen wipes and transitions were also added too. Cartridges, Boxes and Manuals were being mass-produced around this time, alongside an incredible lightshow at the CES Tradeshow of January 1993 to commemorate the game's release. The lightshow has been recorded and can be watched via this link!

<https://www.youtube.com/watch?v=FGfIDT1I2so>

Marketing for *Star Fox* heavily advertised the Super FX Chip too!

The Final Release...

Star Fox released in February 1993 and received incredible acclaim by critics and fans alike, due to its mind-blowing graphics on a console, great characters and gameplay. Europeans had to wait until June for *Star Fox* to release and due to copyright issues, the game's title had to be changed to *Star Wing* in European regions.

The Overall Result...

Star Fox truly marks an incredible moment in gaming history and has become one of Nintendo's most beloved franchises among fans and critics and even a sequel was in the works almost immediately after release! But that's a story for another time as our journey in the *Lylat System* (the name of the solar system where the *Star Fox* series takes place) comes to an end...