

The background is a dark teal color with several large, semi-transparent circles of varying shades of teal. In the top right corner, there is a solid red rectangle.

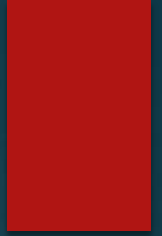
**Dying genre? How did we make  
a mobile flying game**

**AND BUILT THIS AWESOME ARCADE CABINET**



# WAR WINGS

# A Quicker Look



# Topics

1. Background of this projects
2. How it's funded
3. How we identified and solved the most important issues
4. How we nailed the fluid and satisfying combat experience through iterations

# Background

## ▶ Team:

- ▶ 1 designer, 1 engineer at the beginning
- ▶ 1 artist joined during vision demo
- ▶ 3+3 engineers, 2+1 designers, 2+2+1 artists at launch

## ▶ Personal Bio:

- ▶ Started to play with UnrealED since college
- ▶ Worked on AAA projects on console for about 5 years
- ▶ MMO sector for 2 years
- ▶ Have been playing flying games for decade
- ▶ Co-Founded Mobilefish Studio in 2012

# You got to be kidding me?

- ▶ A dying niche genre game, against the backdrop of blooming market full of relatively much easier to make casual games, or to be more specific, building games and combat card games?
- ▶ We'll never get green light to do such a project!



# Still we get approval to start

- ▶ We just launched a “cold” project that took us 10 month to finish, when no one had been willing to make it
- ▶ We took it, and finished it
- ▶ And it was taken very positively
- ▶ So the Company kind of owe us a favor, which gives us some power over what we do next

# China Atlas 3D





# Still, have to prove its worthiness

- ▶ Who do you want to sell this to?
- ▶ How much do you extract from each one of them, in average, per month.
- ▶ How long can you keep milking them?
- ▶ Those are all hard questions!
- ▶ Our last product had no more than 20k downloads, God help those who believed the forecasts I send out.
- ▶ Are they stupid?
- ▶ No they are not, they are business man, they are survivors.

# Proved!

- ▶ We made one hundred of logos and when people see the money, they immediately approves.

WAR WINGS



WAR WINGS



WAR WINGS



WARWINGS

血战长空

**WAR WINGS**

**WAR WINGS**



WAR WINGS

WAR WINGS

WAR WINGS

WAR WINGS

WINNER!!

WEAR WINGS\$

WE ALL WIN\$

# Except it's not true

- ▶ No matter what I say, how I say it, people need to see something solid before handing over the check.

# We made this





Quit

Switch  
PostProcess

- Create AI Plane
- Random position
- 6 o'clock
- 12 o'clock
- 3 o'clock
- 9 o'clock
- On top of player
- Under player
- Target Drone



PAD  
LOCK

DFM

BOOST

BRAKE

FIRE

FIRE  
SECONDARY



Quit

Switch  
PostProcess

Create AI Plane

Random position

6 o'clock

12 o'clock

3 o'clock

9 o'clock

On top of player

Under player

Target Drone

PRD  
LOCK

DFM

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CALIBRATE  
Development Build

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LOCK

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BOOST


BRAKE

FIRE

FIRE  
SECONDARY

CALIBRATE  
Development Build



- 
- ▶ It's a gameplay prototype supposed to solve the most difficult issues like control, combat pace, AI
  - ▶ Because gameplay is KING!
  - ▶ Except it's not true
  - ▶ At least for us

# Instead, we showed this



# And this





# Answers the most important questions

- ▶ Selling points:
  - ▶ Good looking
  - ▶ A lot of monetization potential

# Lessons learnt

- ▶ Gameplay IS king
- ▶ But it has to be a good looking king
- ▶ This is **not** supposed to be a tutorial on **cheating**
- ▶ It's a sign of commitment and a demonstration of result-driven mindset

# Preparations that had been done during early stage

- ▶ We've studied every single major flying action game out there since 1988
- ▶ We've accumulated a ton of data sheets, tutorials, samples and references on every aspects

INTO THE TEETH OF THE  
CAT TALES — GADBOIS  
**ANGELS ZERO**

lot

238

LEAD PILOT AT PEARL HARBOR

**BATTLERS OVER THE AEGEAN**

BRIAN C

WITH WINGS LIKE EAGLES  
THE UNTOLD STORY OF THE BATTLE OF BRITAIN



**MICHA**

THE RISK  
ON THE JO  
NATURAL AN

**SAMURAI!**

*Spitfire Pilot*

FLIGHT LIEUT  
DAVID GRC  
THE GERMAN ACES'S SPEA  
WWII Through the Eyes of Four Men and the Luftwaffe's Most Important Co

HEATON  
LEWIS

**THE STAR OF AFRIC**

**GNATSNW**

RICHARD OVERBY THE BOMBING W

RICHARD OVERBY THE BOMBING W

Any book or article is subject to change without notice.



MobileFish Co. Ltd

ERSHAW WEEVY

WIND LIGHT

FIRE  
IN THE  
SKY



## Warbirds Gunnery Model

In this write-up I plan to talk about the Warbirds Gunnery Model, as far as I understand it, and how it relates to "real" gunnery. In order to become an effective shooter in Warbirds, one must understand the dynamics of the gunnery system in place in order to be most

The purpose of a fighter's primary weapon used for A from 7.7mm slug throwers plane, only a gun (or in a viable method of downing

## Sustained Turn Rate per plane type per altitude (sustained turn rate speed)

	no flap 1,000ft	5,000ft	10,000ft	15,000ft
F6F	17.3s	18.5s	21.5s	24.0s
F4F	17.8s	18.0s	20.2s	21.0s
FM2	16.4s	17.6s	21.2s	23.0s
F4U	20.0s	22.8s	24.2s	28.0s
A6M2	13.2s	14.2s	16.7s	18.0s
A6M3	13.8s	14.9s	16.7s	19.0s
A6M5	15.1s	15.4s	18.4s	21.0s
Ki43	12.6s	13.6s	15.9s	18.0s
Ki84	17.4s	18.9s	21.7s	25.0s
Bf 109E4	18.0s	19.3s	21.2s	24.0s
Bf 109F4	18.8s	19.8s	22.0s	24.0s
Bf 109G6	20.9s	22.9s	24.1s	27.0s
Bf 109G6R6	22.8s	24.1s	27.4s	31.0s
Bf 109K4	20.6s	22.6s	25.9s	28.0s

## Hoof's Warbirds

## WB G Limits Study

When flying Warbirds and pulling G's sometimes the screen will darken, and it is unknown is a) whether the G levels that this occurs at varies for different aircraft or b) are they? This study attempts to determine the G level when the screen goes fully black.

Robey Price (another WBer) and I exchanged email for a bit with some preliminary data to determine G from the stall speed and the blackout speed). Turns out that the wings have maximum Angle-of-Attack at 1g of lift), and divide the angle-of-attack, you can determine the G force on the plane. I used this point at which the screen starts to darken, and the point at which the screen

My method was to load up 10% fuel, and start at 5,000ft. I would dive under max-g left turn. I would then record the speed at which the screen became clear (that the screen wouldn't clear if I let go of the stick). As speed slowed, the screen was completely normal (not darkened). I repeated this test two more times and averaged the results. For stall speed, I flew at 1,000ft and maintained a longer stay flying level was called the stall speed and recorded. All test results are in the 1024x768 art.

The results:

Plane	Stall Speed	Blackout Ceases	Effective G	Screen clear	Effective
F6F	95mph	280mph	8.7g	220mph	5.3g
F4F	85mph	225mph	7.0g	190mph	5.0g
FM2	85mph	230mph	7.3g	195mph	5.2g
F4U	100mph	270mph	7.3g	220mph	4.8g
A6M2	65mph	200mph	9.5g	170mph	6.8g
A6M3	70mph	205mph	8.6g	175mph	6.3g
A6M5	70mph	205mph	8.6g	175mph	6.3g
Ki43	70mph	205mph	8.6g	175mph	6.3g
Ki84	90mph	270mph	9.0g	220mph	6.0g
Bf109F4	90mph	265mph	8.7g	215mph	5.7g
Bf109G6	95mph	270mph	8.1g	220mph	5.4g





进入DFM状态  
DFMを仕掛けた

Easing



切换了武器  
武器を切り替えた

Easing



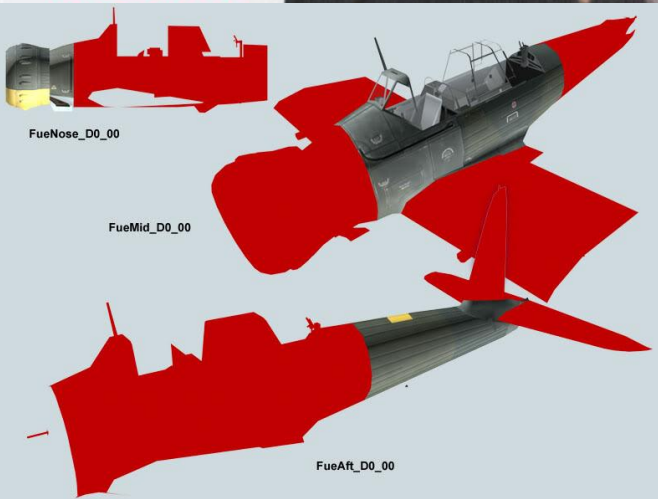
Immediate

视角镜头完成



LookAt

敵を倒した  
击落敌人



# You see, the 1<sup>st</sup> fun part starts right now

- ▶ It's a funded project now---best case scenario.
- ▶ We don't have to quit our job and rent a basement to do this, so hurray!
- ▶ We've been given a month to bring a "vision demo" to people
- ▶ Fair enough but not easy



# A series of decisions

- ▶ **Make a game we always wanted to make while ensuring ROI for the company**
- ▶ What we want: Authenticity, Shiny Graphics, Kick Ass gameplay, story untold by western developers or our Japanese neighbor
- ▶ What the company want: Attractive to large population, deep deep monetization, make 1 game then sell to a dozen of countries
- ▶ Biggest Issues:
  - ▶ People: we'll make sure that we CAN make it to start with
  - ▶ The China Atlas team is splitting because not all people can resist popular trend



# Finding the right problems

- ▶ So we worked on what 2 of us can solve first----luckily, with the skill set that we had, all the core elements are solvable
- ▶ And they are:
  - ▶ How “real” is enough
  - ▶ The exact feature set to make the gameplay kick ass
  - ▶ How to convey story in the most cost efficient way
  - ▶ How to monetize
- ▶ All design related
- ▶ They are going to shape the game it is supposed to be
- ▶ With them, the early game will shine, it will sell itself, we can attract talent using it

You have all the  
weapons you need.



You have all the weapons you need.



The background is a solid teal color. In the top right corner, there is a small red rectangle. Several large, semi-transparent teal circles of varying sizes are scattered across the background, creating a layered effect.

NOW FIGHT!

# Solve the problems

- ▶ **How “real” is enough**
- ▶ The exact feature set to make the gameplay kick ass
- ▶ How to convey story in the most cost efficient way
- ▶ How to monetize

# Realism?

- ▶ For a lot of times, it's novelty
- ▶ People is impressed by super slow motion films not because it's realistic, but because it's a novel experience
- ▶ So 1 rule to make our feature set
  - ▶ It should have the top gun vibe, how cool it should be----inverse fly over a MiG kind of cool

# And it's been proved





# Graphics: The thing we strive for

- ▶ Glare---sense of space
- ▶ Reflections---sense of space
- ▶ Control surfaces
- ▶ Flaps---we want to push this
- ▶ Trails
- ▶ vapor trails over wings---exaggerated
- ▶ Propellers that have thickness
- ▶ Part damage---not only a visual eye candy but also a gameplay decision



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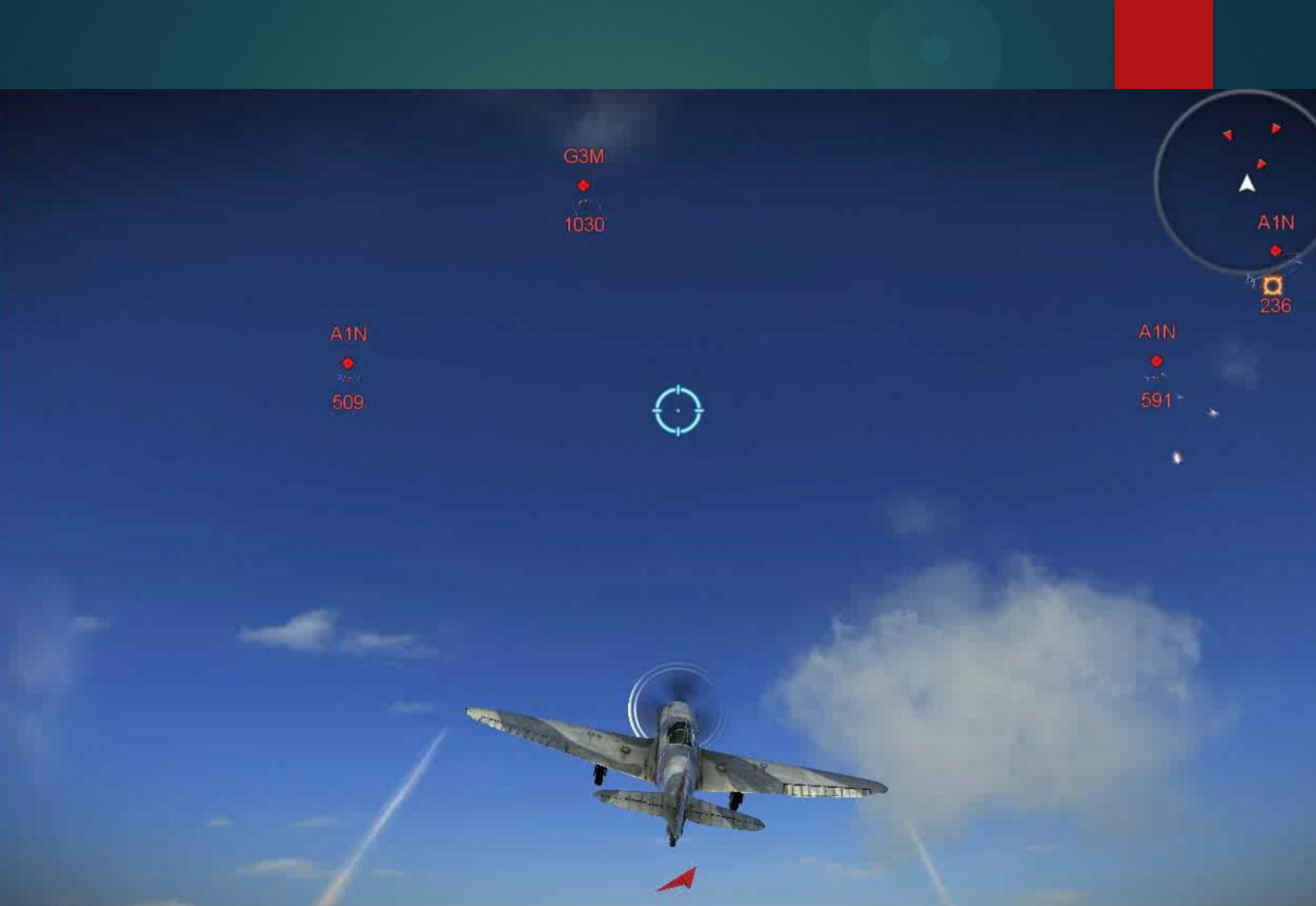






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G3M

1030

A1N

509



A1N

591



A1N

236

# Graphics: The thing we strive for

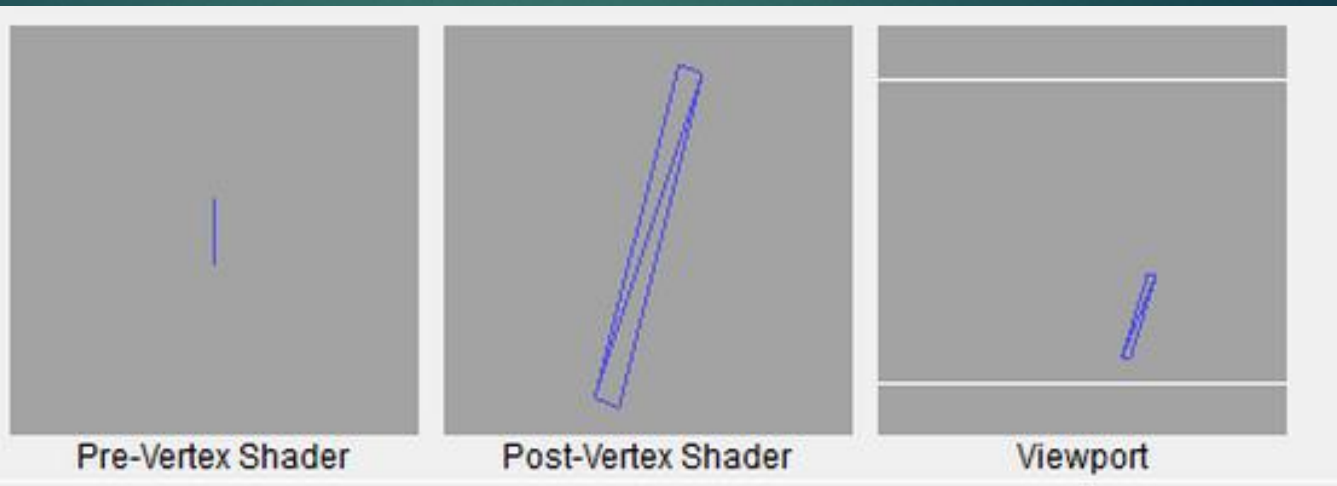
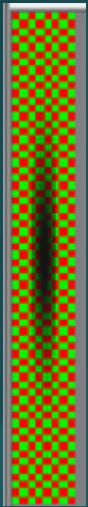
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# Rendering Trick



# Graphics: The thing we strive for

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# Solve the problems

- ▶ How “real” is enough
- ▶ **The exact feature set to make the gameplay kick ass**
- ▶ How to convey story in the most cost efficient way
- ▶ How to monetize

# Gameplay choice-Right the wrong

- ▶ Flying game is a brain intense spatial puzzle, it's about accessing speed, distance and angle, with a lot of vertical element involved, make the brain solve all those things is physically demanding
  - ▶ On top of that, plus a 200 page manual to read and a 100 plus command to remember
- ▶ It should right the wrongs, or at least not introduce more wrongs into this poorly received genre



# Go Big or go small

- ▶ Big---the be all , end all solution, the silver bullet, the revolutionary idea!



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Loading...

# Go small

- ▶ Big solution pros and cons
- ▶ Pro:
  - ▶ Easy to handle---one hand
  - ▶ Feels intuitive
- ▶ Cons
  - ▶ Defeat the common fantasy of flying an aircraft
  - ▶ Identity crisis---this is a “tactical” game, or a shoot-em-up?
- ▶ So we go small, and fix the problems that plagued this genre for years

# Gameplay fix list

- ▶ So many gauge, buttons, dials and axis
- ▶ Hard to navigate, or sometimes even to orientate
- ▶ Overshoot all the time, sometimes speed, sometimes angle
- ▶ Lining up shots are daunting, leads and drops are nightmares



# Complexity goes away, keep depth

- ▶ We decided not to keep any feature if its depth can not be supported by levels, or is really marginal fun compared to its learning cost, like what----like fuel mixture and engine RPM, spins and single wing stalls
- ▶ Even flying could be simplified, as long as the most basic elements are kept to support the single most important moment—shooting your target to pieces
- ▶ Shooting---drops out of question, convergence out of question, lead, part damage and damage diminish is chosen
- ▶ Ammo count is removed, only a overheat rule is introduced to encourage carefully planned shots instead of spray and pray

# Control features in action--- gimbal lock



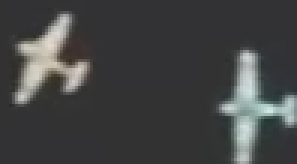
# Gimbal Lock fixed



# Removal of navigation, auto pilot a bad idea?

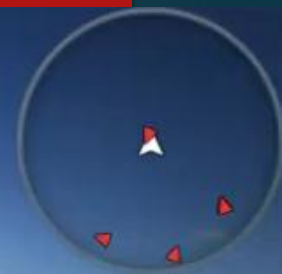
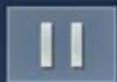
- ▶ It removes all the sense of flying!
- ▶ No, it won't
- ▶ It merely executes low level actions
  - ▶ It only does "pure pursuit"
- ▶ Real "strategic thinking" is kept intact:
  - ▶ Angle of position
  - ▶ Approaching trajectory
- ▶ You don't expect to pure pursuit a real person to get a kill, no no no.





# Spotting a target, the situational awareness challenge

- ▶ Padlock of course, make it comfortable
- ▶ Then a real simple, elegant way to let player observe his surroundings, without losing his orientation
- ▶ God view of course----a horizontally stable bird eye view, the most natural way for the most of us to observe the whole picture



# Shooting! Shooting is everything

- ▶ Iteration 1
- ▶ “realistic” shooting, but very high damage
- ▶ Like in ace combat 3,4,6
- ▶ Not working of course
- ▶ It's miserable fail or an instant kill
- ▶ People needs a valuable 1~2 second to realize they are lining up a good shot, without that, brain just doesn't have enough time to register a “good kill”
- ▶ The emotional little person, remember?





A5M  
719

A5M  
809



# Iteration 2, auto gun

- ▶ We don't really need to actually make it to prove its imperfectness
- ▶ Not because it's "unrealistic", but because it's not rewarding, the cause and effect is just so weak







# Iteration 3, auto turn

- ▶ And yes, leave room for shots leading
- ▶ Spot a target, then turn at it, adjust path on the way, line up a shot, and feel very satisfied by this fluid process
- ▶ Empower the player, even if by giving him some assists



# Adding a final touch

- ▶ Shooting camera
- ▶ It really makes everything shine





# Now it's responding, fluid, and rewarding!

- ▶ Most importantly, it plays really well on even casual users
- ▶ Natural and powerful
- ▶ We borrowed a lot of things from:
  - ▶ After burner
  - ▶ Pilot wings
  - ▶ Wings
  - ▶ War Thunder---it gives us a shining example, how the most complex game would be tweaked so easy
  - ▶ Thunder wolves---there are a lot of games that have a “sticky cursor” but this one is by far the closest to our vision

# Solve the problems

- ▶ How “real” is enough
- ▶ The exact feature set to make the gameplay kick ass
- ▶ **How to convey story in the most cost efficient way**
- ▶ How to monetize

# Story driven? No~~~

- ▶ It's a mobile game, so tight budge of course
- ▶ Plus it's extremely hard to get a good layout animator who's willing to deal with non-human shots
- ▶ Methods to make people feel more engaged in story:
  - ▶ Cinematic
  - ▶ Talking heads
  - ▶ Really beautiful briefing UI and briefing arts



Target into the bombing range, ready to drop bombs.



# Briefing



Briefing as a story telling method  
Yes of course, no body reads the mission description  
But they'll be looking at the pictures



# WAR WINGS



# WAR WINGS



MOBILEFISHSTUDIO  
BEIJING





**WAR WINGS**



**WAR WINGS**





This is captain Hawkingson, The Bomber are coming after us, we need some one to sweep the mines on the water before the enemies Stukas drop those bombs over our head!



# Solve the problems

- ▶ How “real” is enough
- ▶ The exact feature set to make the gameplay kick ass
- ▶ How to convey story in the most cost efficient way
- ▶ **How to monetize**

# Got to milk them dry...

- ▶ Cosmetics, of course
- ▶ Plane parts and camo of course
- ▶ Upgrades, very natural
- ▶ Nose arts, as “dog tags”
- ▶ Later we added an energy system
- ▶ **No card tricks**
- ▶ We make a game we always wanted to make, in the way we liked to make it

# Vision demo passed

- ▶ Team expanded gradually
- ▶ Features are being poured in as well
  - ▶ Hangar, Mission, Upgrade, Research, Level up
  - ▶ Chat, PvP, Friends, IAP
- ▶ Another daunting tasks at hand----to push every aspect of the game to “product” level
- ▶ OMG, can I not do those, can I just launch an “indie game” that doesn’t guarantee ROI?



# The point of no return

- ▶ The company funded this project, we can not turned down those features at this time
- ▶ Indie = Free to Fail ?
- ▶ Funded = Responsibility
- ▶ The great debate of “Design by market vs. Design by innovation” will go on
- ▶ But, we kept one thing in mind: we design for success

# Happily ever after?

- ▶ Of course not
- ▶ Issues that emerged as the team grows:
- ▶ Developers that had no experience in the genre
  - ▶ Used to be an advantage and now it's weakened
- ▶ Developers that had not so much experience in shipping a product
  - ▶ Beijing, Blooming market, Being under the radar as a studio----together they gave a huge recruiting challenge
- ▶ Tools are giving us a rather hard time

# Not end of the world, either

- ▶ We set a rule ,that ANY new developer MUST complete some certain game, so we can have a mutual understanding of certain things
- ▶ Training, training, and training
- ▶ And we share experience in the team
- ▶ A rule---you don't have lunch alone, you watch something when you eat
- ▶ And, as much as I'd like to throw the crxxpy engine out of the window, we make do
  - ▶ Because we know it's all about people
  - ▶ It's the headcount that gives us the hell, not the software

# Valuable lessons we learnt

- ▶ Talent is so important that we need to find out the proper ones in the earliest stage, and train them very well, the time on training is generally well spent
- ▶ Tools are important as well, know them well, make time to know them well, recruit someone who knows it well, or just someone is rather keen to know them
- ▶ We don't necessarily need sophisticated project management, but we do need the WILL to collaborate and communicate
- ▶ You can do a project fast, cheap and with high quality, but ONLY when very well prepared
- ▶ Prototype as much as possible, and don't believe anything like "we'll figure out this when we start coding"



# So how well is turns out to be?

- ▶ We don't know
- ▶ Not launched yet
- ▶ Licensed to 2 publishers, ROI mark is hit

But we enjoyed every bit of it



# Takeaway

- ▶ Don't be afraid of working on a niche genre----as long as you're well prepared
- ▶ Good game will always be supported, but first it has to be visually appealing
- ▶ Design for satisfaction, not realism
- ▶ Know your genre, it would save you a lot of time making right choice
- ▶ Be responsible, to investor, and to ourselves.

# Thank You

钟文

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**WARWINGS**



**MOBILEFISH**  
— BEIJING —