

A person in a suit

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ICL-1302 Computer Systems

TOBY BEEVERS

*Cambria ID: 21075206 Bangor ID: 500704883*

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# What is Battlefield One

In October 2016 Electronic Arts (EA) publish Battlefield One, a single shooter game developed by DICE a subsidiary of EA.

The gameplay is based on a World War One period and is inspired by historical events. Although Battlefield is a single person shooter game, emphasis is given to teamwork which is supported by Multiplayer modes such as Rush, Operations and War Pigeon.

Reviews by critics where positive and the game was seen as an improvement on its predecessors Battlefield Four and Battlefield Hardline, selling over 15 million copies worldwide, and winning Best Action Game at the 2016 Game Critics’ Awards.

# Requirements of Battlefield One

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# Battlefield One with Xbox One

The Xbox One and Xbox One S where release in 2013 and 2016, being one of the mainstream gaming consoles at the time of Battlefield One being released makes them a perfect candidate for a technical comparison.

|  |  |  |
| --- | --- | --- |
|  | **Minimum** | **Xbox One S** |
| OS: | 64-bit Windows 10 | OneCore OS, part W10 but using Hyper V to create x64bit Virtual Machines |
| Processor: | AMD FX-6350 or Intel Core i5 6600K | 1.75 GHz Custom 8-core x86 AMD Jaguar |
| Memory: | 8 GB RAM | 8 GB of DDR3 RAM + 32 MB eSRAM |
| Graphics: | AMD Radeon HD 7850 2GB  NVIDIA GeForce GTX 660 2GB | AMD Radeon Graphics Core Next engine (914 MHz) |
| DirectX | Version 11 | Microsoft APIs, native to Xbox |
| Network: | Broadband Internet connection | Ethernet: 1 x 10/100/1000 Mbps Gigabit Ethernet RJ-45 LAN  Wi-Fi: Wi-Fi 5 (802.11ac) Dual-Band (2.4 GHz, 5 GHz) |
| Storage: | 50 GB available space | 1TB plus 8GB Flash Storage |

### Xbox One S Operation System

The Xbox One S is producer by Microsoft and leverages parts of the Windows 10 OS which is in line with Microsoft’s *Windows Everywhere* approach.

The Xbox system uses a Hypervisor (Hyper-V) architecture as the host OS, with two partitions the first is a custom Virtual Machine used primarily for gaming, the second being used for shared VM for running the OS and applications.

(Microsoft, 2023)

### Xbox One S Processor

AMDs Jaguar Chip is a low powered microarchitecture, referred to as an APU, the Jaguar chip combines a general-purpose CPU with a Graphics Processing unit in the same microcircuits.

The Xbox One S uses a custom version of the Jaguar chip which offers an increased power over the readily available AMD GPU, each custom Jaguar chip has two modules, each with eight cores (*standard is 4 cores*), however Threads are not shared across cores.

**CPU Comparison**

|  |  |  |
| --- | --- | --- |
| **Intel Core i5 6600K** | **AMD FX-6350** | **AMD Jaguar** |
| 4 Cores, 4 Threads | 6 Cores, 6 Threads | 8 Cores, 8 Threads |

(Intel, 2023) (AMD, 2023)

### Xbox One S Memory

The Xbox offers two slightly different Memory solutions 8GB DDRAM and 32GB SRAM, this design helps to try and reduce the latency of SRAM and increase capability benefits of DRAM.

As Xbox’s, by design are intended for gaming, the Memory availability is imperative for a successful user experience, each DRAM cell has transistors and capacitors in an integrated circuit, the data bit is stored in the capacitor. Transistors are known to leak a small amount, the capacitors will slowly discharge, causing information stored in it to drain, therefore DRAM must be refreshed every few milliseconds to retain their data.

SRAM is made up of four to six transistors, it keeps data in the memory if power is supplied to the system unlike DRAM, which must be refreshed periodically. This makes SRAM faster but also more expensive, meaning DRAM is often used more in computer systems.

### Xbox One S Graphics

The GPU for the Xbox One S was a design by AMD based on the widely available Durango 2 chip, this is an integrated card that requires no extra power connector.

**GPU Comparison**

|  |  |  |
| --- | --- | --- |
| **AMD Radeon HD 7850 2GB** | **NVIDIA GeForce GTX 660 2GB** | **AMD Radeon Graphics Core Next engine (914 MHz)** |
| Launch Price $249  Power Consumption 130W  Memory DDR5 2GB  API Supported DirectX 12 | Launch Price $229  Power Consumption 140W  Memory DDR5 2GB  API Supported DirectX 12 | Launch Price $399  Power Consumption 95W  Memory DDR3 8GB  API Supported DirectX 12 |

# Battlefield One Desktop PC Comparison

The most important consideration for a gamer is User Experience, focusing on the Battlefield One UX and considering that most game play will be undertaken online one can assume that network connection speed and frame rates are high on the agenda for any moderate gaming enthusiast.

Whilst this assignment calls for comparisons between hardware components, consideration for network speeds should not be underestimated, the user could spend £1,000’s on hardware and still not get the expected experience. Furthermore, the refresh rate of the users’ screen can also impact the FPS, investment into an expensive GPU could be restricted if the same level of consideration isn’t given to the monitor.

### Selecting CPU, Motherboard & Cooler

Selecting a CPU needs to be considered carefully, higher clock speeds and core counts can make a massive difference in performance, which provide smoother gameplay and faster completion of intensive tasks.

The CPU you choose will also dictate your motherboard options, as each processor only works with a specific CPU socket and chipset. Next you need to consider the case size of the machine, if you’re starting from scratch then you will be able to purchase the box that meets you needs, however, consideration needs to be given to head space and motherboard fixings.

Finally, the power supply, arguable the most importance component and often overlooked. Poor power supply selection can lead to voltage fluctuations and power surges that can damage parts of the PC. Similarly, your Power Supply might have enough power to keep your PC running when you’re not doing much, but once the GPU and the CPU begin to draw more power, it can struggle.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Minimum** | **Low Cost** | **High Cost** |
| Processor: | AMD FX-6350 or Intel Core i5 6600K | Intel Core i5-6600K 3.5 GHz Quad-Core Processor  **£155**  Cooler Master X Dream I117 36.5 CFM CPU Cooler  **£11** | Intel Core i7-4770K 3.5 GHz Quad-Core Processor  **£448**  Asus ROG RYUJIN III 360 ARGB EVA-02 EDITION 70.07 CFM Liquid CPU Cooler  **£396** |
| Motherboard: |  | MSI Z270-A PRO ATX LGA1151 Motherboard  **£267** | Asus B85M-G Micro ATX LGA1150 Motherboard  **£10,899** |
| Power Supply: |  | Aerocool Integrator 500 W 80+ Bronze Certified ATX Power Supply  **£40** | Asus ROG THOR 1600T Gaming 1600 W 80+ Titanium Certified Fully Modular ATX Power Supply  **£591** |

### Memory & Storage

The original specification was using SRAM and DRAM due to the cost prohibition, however, advances in technology have allowed for a greater use of DRAM. Specs for Battlefield One ask for at least 8GB RAM but in today’s world I would be looking to increase this to a minimum of 16GB.

With the cost of storage greatly reducing since the launch of Battlefield the use of Solid State Drives has become the norm, the important consideration is the Read/Write capacity of the SSD and whether the data is sequential or random.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Minimum** | **Low Cost** | **High Cost** |
| Memory: | 8 GB RAM | Corsair Vengeance LPX 8 GB (1 x 8 GB) DDR4-2400 CL16 Memory  **£20** | G.Skill TridentZ RGB 64 GB (2 x 32 GB) DDR4-4600 CL20 Memory **£650** |
| Storage: | 50 GB available space | Toshiba MQ01ABD050 500 GB 2.5" 5400 RPM Internal Hard Drive  **£12** | Western Digital Gold 22 TB 3.5" 7200 RPM Internal Hard Drive **£534** |

### Graphics & Sound

GPU or Graphics Card/Interface is perhaps seen as the most important part of any system for gaming purposes, however, just selecting a top end GPU does not guarantee the perfect user experience. Balance should be given to other hardware like monitors and a low refresh rate could mean you do not maximise your expense GPU at all.

The minimum GPU requirements for Battlefield 1 is 2GB, whilst it is possible to overclock you GPU, it is highly recommended so increase the headroom and your GPU to 4GB for a better user experience.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Minimum** | **Low Cost** | **High Cost** |
| Graphics: | AMD Radeon™ HD 7850 2GB  NVIDIA GeForce® GTX 660 2GB | Zotac ZT-71113-20L GeForce GT 730 2 GB Video Card  **£68** | PNY VCNRTX6000ADA-PB RTX 6000 Ada Generation 48 GB Video Card  **£9257** |

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