

Computer Build Report

by James Beard

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Abstract

This report aims to discuss the characteristics and concepts required to build a computer system and the compounds needed to do so. This report first discusses the process and compounds chosen to build a computer system for an elderly relative who wants a low-cost desktop pc that can run simple software, watch YouTube and video call with family abroad, this can be found in Section One. Section One itself will be split into several sub-section where the author will discuss why he chose specific compounds for this build such as the amount of RAM he choice. Section Two of this report discuss the process and compounds chosen by the author to build a computer set up for a recent graduate trying to start up his own company, producing and editing 4k videos on a budget of £2500 (inc vat). Once again, the compound choices will be discussed further in the subsections. Section Three discusses the NAS unit chosen for the graduate. Finally, the reader can find the authors full shopping list for each build in the appendixes with the elderly relative shopping list in the first appendix, the graduate in the second and the NAS unit in the third.

Section One – Elderly Relative Computer Build

1.1. CPU

The CPU that the author felt would suit this build for an elderly relative was an Intel Pentium G5400 at £50.98 [1]. This CPU offers a clock speed of 3.7GHz [1] that should be more than enough for the suitable performance of the computer for the relative. The CPU also comes with 4MB of L3 cache and 512Kb of L2 cache [1] that should allow for a good start-up speed for the computer for what it cost. Though it is an L3 so it will be slower than an L1 or L2. The CPU comes with two cores and 4 threads allowing for multiple processes to be completed simultaneously. The thermal design power at a maximum theoretical load of 54 watts [1] should be more than adequate for this build.

1.2. Motherboard

The motherboard that the author felt was most suitable for this build for an elderly relative was Gigabyte H310M H Micro ATX motherboard at £52.97 [2]. The processor socket for this motherboard is an LGA 1151 and is Intel CPU compatibility [2] making this motherboard capable with the chosen CPU above. The motherboard comes with a built-in cooling system referred to as smart fan 5 [2] to help keep everything cool when the PC is running.

1.3. RAM

The Ram chosen for this build was the Corsair Vengeance LPX 4GB at £23.09 [3]. The author believes that 4GB of ram should be more than enough for the functions that the relative intends to use as long as the relative is taught to close the programs once they are finished then 4GB of random memory should allow for a good performance. The author felt that although it may sometimes be better safe than

sorry, 8GB of RAM would be too much for this build as the relative is not likely to be using programs that consume a large amount of memory.

1.4. Non-volatile storage

The storage device selected by the author for this build was an Integral 240GB P Series 5 SATA 3 SSD Drive at £27.95 [4]. The author chose this for storage as he believes that 240GB of storage should be more than enough for all the documents, programs, and family photos that the relative will likely need it to hold. The storage device was also roughly the same price of any 128GB hard drives he came across and comes with twice the memory. The SSD drive allows for transfer speeds up to 560MB/s [4] that the author feels will be more than adequate speed for the relative.

1.5. Keyboard/Mouse

The Keyboard and mouse selected for this build is CiT USB Keyboard and Mouse Combo and comes as a pack at £10.52 [5]. The reason for this choice is that the relative doesn't require the keyboard or the mouse for any special purpose such as gaming so the author chose this pack as it was relatively good value for money and has positive reviews from others, and the connection type is a USB cable [5] so no worries about being unable to connect to the PC because of an outdated legacy connection.

1.6. Speakers

The speakers chosen for this build were Hama E80 speakers at £9 for the pair. The two speakers have an output power of 120mW each [6]. The speakers were chosen mainly on ensuring that the best value per output was met, many of the speakers the author found cost more for the same output and those with higher output cost considerably more money. Thus, making these speakers the best value for money that the author could find for this build.

1.7. Graphics card

The graphics card selected by the author for this build was a Palit Geforce GT710 1GB costing £30.99 [7]. With a GPU clock speed of 954 MHz [7], a speed that should be more than enough for YouTube videos and video calling to be streamed in good quality for the price paid and an effective clock speed of 5000Mhz [7]. A memory bus width of 64 bit [7], though on the lower end of the graphic card spectrum the author believes it should be more than able to enough data per second for what is required by the relative.

1.8. Suitable case

The case chosen by the author is a Kolink KLA-002 Mid Tower Case costing approximately £19.90 [8]. The case specification compliance is ATX and supports mini-ATX motherboards making it compatible with the motherboard specified above.

The case comes with two USB 2.0 slots and one USB 3.0 slot for faster transfer speeds as well as HD audio in/output [8]. A pre-installed 8cm fan to help with keeping the system cool while running, with room for two 12cm fans to be installed at the front of the case [8]. Plenty of room for the chosen graphic card to fit into. Several expansion slots for hard drives in various sizes to store all the relative's data.

1.9. Power supply

The power supply unit chosen for this build is a Novatech 750W ATX Power Supply costing £29.99 [9]. As specified in the product name the unit runs at up to 750w of power [9], a wattage that the author believes is more than enough for the system. As the product supports ATX the PSU should fit into the PC case perfectly. Finally, the PSU comes with a 12 cm fan [9] fitted to aid with keeping the unit cool while running.

1.10. Suitable monitor

The monitor chosen by the author for this build was an ACER KA221Q Full HD 21.5" LED Monitor costing £69.99 [10]. The 21.5" monitor [10] should be more than big enough for the relative to watch YouTube videos, perform video chats with family and perform the other basic function required by the relative. The monitor's response time is 5ms and has a refresh rate of 60 Hz [10] that the author also feels will be just fine for the relative for the task they wish to complete for the price they specified will the ability to run at 1920 x 1080p HD [10] with an HDMI connection.

Section Two – Graduate Computer Build

2.1. CPU

The CPU selected for the recent graduate is a Ryzen 9 3950X Sixteen Core 4.7GHz costing £698.99 [11]. The CPU contains 16 cores splitting into 32 threads [11] allowing the graduate to complete numerous tasks on the system simultaneously. An all core base clock speed of 3.50GHz and a single-core boost clock speed of 4.70GHz [11]. 8MB of L2 cache, 64MB of L3 cache [11], though as referred to before the L3 is slower compared to L2 or L1. The author, however, feels that the size of the L3 cache with the L2 cache should give the graduate a more than good enough performance for video editing for a much more reasonable price to performance when compared to other more expensive CPUs.

2.2. Motherboard

The Motherboard chosen for this build was a Gigabyte X570 AORUS PRO AM4 DDR4 ATX Motherboard costing £238.98 [12]. The socket for the motherboard to connect to the CPU is AM4 as is the CPU above and was designed to provide full support for third-generation AMD Ryzen processors which the CPU is [12]. The motherboard also uses thermal reactive armour to help ensure that the systems main compounds run smoothly without overheating. The motherboard's wireless communication module compatible with WIFI 802.11a/b/g/ac/ax and supports 2.4/5

GHz dual-band [12], WIFI 802.11ac will be more useful at the present probably as it will allow for good internet speeds if the router runs at the standard however WIFI802.11ax is considered to be the next step up from 802.11ac [13] and if and when they graduate upgrades his router in the coming years to this standard their desktop will be able to run it. The Motherboard does also come with an ethernet port that runs Intel 1GbE Lan chip if at up to 1000Mb [12] if the graduate prefers to use an ethernet cable.

2.3. Amount of RAM

The RAM selected for this system is a 16GB G.Skill Trident made up of two 8GB DIMM Dual-channel kits costing the graduate £102.75 [14]. The memory type of the RAM is DDR4 and the memory speed of 3200MHz [14] should not only make this compatible with the motherboard and CPU but run at an optimal speed for the system. the author believes that 16GB should be a good amount of random memory for the graduate to edit their videos and run the editing programs efficiently.

2.4 Non-volatile storage

The main hard drive chosen for this system is a Samsung 860 QVO SATA III 2.5-inch 2TB SSD costing £ 212.63 [15]. The hard drive has a transfer speed of up to 550 MBps reading and 520 MBps writing [15], transfer speeds that will allow the graduate to store data in good time. The author also believes the 2TB is a good start for the graduate to store his videos, editing programs and other files though they may quickly run out of memory as work picks up. This is why the author also added a secondary hard drive to give the graduate more room for their work. The device is a Seagate BarraCuda 6TB Desktop 3.5" Hard Drive costing £120.97 [16]. This secondary hard drive will give the graduate 6 more Terabytes of storage space, an amount that the author believes should an excellent starting point for the author to be able to store numerous videos to be stored and saved.

2.5 Keyboard

The keyboard that the author chose for this build was a wired Adobe premiere pro keyboard costing £79.99 [17]. The keyboard uses both letters and the function symbols on them while also being colour code [17] to group the function types together so that the graduate can quickly learn and find the desired button they need for a specific function. The keyboard is specially designed to work effectively with all of the versions of Adobe premiere pro CC [17] , one of the most widely used videoing editing programs on the market.

2.6. Mouse

The mouse chosen for the graduate and their computer system was a Logitech MX Vertical Mouse costing the graduate £ 75 [18]. The reason for this pick was that the author feels that dues to its wireless design it will give the graduate more freedom of movement without being confined with a wire. The mouse is designed in a way that allows for the graduate's wrist, hand, and forearm to hold a natural position lowering

the stress on the body parts [18], allowing for the graduate to complete more work with cramp or injury.

2.7. Graphics card

The graphics card selected by the author for this system is an MSI GeForce RTX 2060 Ventus XS OC 6GB Graphics Card costing £ 349.98 [19]. The card has a boost clock speed of 1710 Mhz, a base clock speed of 1365 Mhz and a memory speed of 14 GBps [19] ensuring high quality for the graduate and his system. The graphic card has a preinstalled double fan with one curved blade fan to allow for an increased airflow speed and another normal blade fan to allow for steady airflow to the heat sink below [19]. The combination should help ensure that the graduate can create high-quality videos without the system overheating and performance issues.

2.8. Suitable case

The case chosen for this build by the author was a Pure Base 600 BGW20 Silent Case costing £94.99 [20]. Firstly, the case is compatible with the motherboard chosen in this build. The case comes with several expansion slots for the graduate to add connections to, numerous drive bays to add more storage and memory if the graduate begins to run out of space to store their videos [20]. The case includes two pure wings two fans to help keep the system cool and help prevent overheating with slots to add more fans and cooling components [20].

2.9. Power supply unit

The power supply unit selected for this build is an EVGA 850 BQ 850W Semi-Modular 80+ Bronze unit costing £ 99.98 [21]. This unit will allow for power supply of 850w [21], a wattage that should be more than enough power to cover the power needs of the various computer compounds used in this build. The unit also comes with an automatic fan that allows for quiet operation and only operates when the unit temperature rises [21].

2.10. Suitable monitor

The screen monitor chosen for this build was a BenQ EL2870UE 28" 4K HDR Monitor costing £ 229.94 [22]. The first and most important thing about the monitor is its resolution of 3840 X 2160 [22] meaning that the graduate will be able to view all their videos in ultra HD with the correct connection. The 28" screen size [22] will allow the author to see small details that could be missed on a smaller screen, this way the author can assure that they haven't missed anything that will show up later.

Section Three - NAS Unit

The NAS unit selected by the author was a Qnap 8 Bay 10GbE Desktop NAS with 10GbE SFP+ costing £766.04 [23]. The unit uses 10GbE adapters that will allow for the graduate to back up his files and videos quickly and efficiently leaving them with more time to get on with their work as well as USB 3.1 gen 2 to also allow for data to be transferred to and from flash drives quickly. The unit comes with 2GB of RAM to help maintain high performance [24]. The unit contains 8 bays to allocate to the 8GB hard drives, and although this is over the 56GB specified the author could only find an outdated 7 bay unit that is no longer available to buy. The NAS unit comes with multiple Raid levels that the graduate can set it up to [23]. The author would recommend raid 6 as it will give the graduate as good as if not better data redundancy than raid 5, meaning that there is little chance of losing all of your data as data is divided amongst multiple hard drives, it also allows for two hard drives to fail whereas raid 5 only allows for one hard drive failure, however, has higher overhead parity and more expensive method than raid 5 [25]. However, as the graduate is using this to store their data for their career it import data is not lost. the downside to the unit is that the initial hard drive had to be bought separately, the chosen storage drive was a Seagate IronWolf Pro 2TB NAS 3.5" Hard Drive costing £92.98, with a rotation speed of 7200rpm and 128MB of cache to ensure good performance [24].

Appendix One – Shopping List for an elderly relative

CPU	Intel Pentium G5400 - £50.98 [1]	 [1]
Motherboard	Gigabyte H310M H Micro ATX motherboard - £52.97 [2]	 [2]
RAM	Corsair Vengeance LPX 4GB - £23.09 [3]	 [3]
Non-volatile storage	Integral 240GB P Series 5 SATA 3 SSD Drive - £27.95 [4]	 [4]
Keyboard/mouse	CiT USB Keyboard and Mouse Combo - £13.31 [5]	 [5]

Speakers	Pair of Hama E80 speakers at £9 [6]	 [6]
Graphics Card	Palit Geforce GT710 1GB - £30.99 [7]	 [7]
Case	Kolink KLA-002 Mid Tower Case - £19.90 [8]	 [8]
Power Supply Unit	Novatech 750W ATX Power Supply - £29.99 [9]	 [9]
Monitor	ACER KA221Q Full HD 21.5" LED Monitor - £69.99 [10]	 [10]
Total	£328.17	

Appendix Two – Shopping List for graduate

CPU	Ryzen 9 3950X Sixteen Core 4.7GHz - £698.99 [11]	 [11]
CPU Cooling Fan	Noctua NH-D15 SE-AM4 Dual Radiator Quiet CPU Cooler with two NH-A15 Fans - £79.80 [26]	 [26]

Motherboard	Gigabyte X570 AORUS PRO AM4 DDR4 ATX Motherboard - £238.98 [12]	 [12]
RAM	16GB G.Skill Trident (2 X 8GB DIMM Dual channel kits) - £102.75 [14]	 [14]
Non-volatile storage 1	Samsung 860 QVO SATA III 2.5-inch 2TB SSD - £212.63 [15]	 [15]
Non-volatile storage 2	Seagate BarraCuda 6TB Desktop 3.5" Hard Drive - £120.97 [16]	 [16]
Cooling System	CORSAIR LL Series 120 mm Case Fan - Triple Pack, RGB LED - £75.99 [27]	 [27]
Keyboard	Adobe premiere pro keyboard - £79.99 [17]	 [17]
Mouse	Logitech MX Vertical Mouse - £ 75 [18]	 [18]
Additional USB Ports	DYNAMODE 4-Port USB 3.0 PCIe Card - £ 9.79 [28]	 [28]
Graphics Card	MSI GeForce RTX 2060 Ventus XS OC 6GB Graphics Card - £ 349.98 [19]	 [19]

HDMI Cable	Xenta HDMI 5M 4K High-Speed Black Cable - £1.65 [29]	 [29]
Case	Pure Base 600 BGW20 Silent Case costing £94.99 [20]	 [20]
Power Supply Unit	EVGA 850 BQ 850W Semi-Modular 80+ Bronze unit - £99.98 [21]	 [21]
Monitor	BenQ EL2870UE 28" 4K HDR Monitor - £ 229.94 [22]	 [22]
Total	£ 2471.43	

Appendix Three – NAS Unit

NAS Unit	Qnap 8 Bay 10GbE Desktop NAS with 10GbE SFP+ - £766.04 [23]	
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Storage	Seagate IronWolf Pro 2TB NAS 3.5" Hard Drive - £92.98 [24]	
Total	£859.02	

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Computer Build Report

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

Instructor

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GRADING FORM: GJ_2019

ENGAGEMENT WITH LITERATURE



While the information within the assignment isn't particularly wrong, 'engagement with literature' means you have to show you've read up on the various sections, and can back up your assertions/choices with evidence. Not just quoting sales/product websites This is the weakest section here. E.g. there are numerous sources out there who test and recommend hardware configurations for video editing. These should have been read and cited.

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KNOWLEDGE AND UNDERSTANDING



Again, nothing particularly 'wrong', however you are stating choices without really showing you know WHY.

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COGNITIVE AND INTELLECTUAL



Despite the outcomes being sensible, Could have done more in looking at the alternative solutions, and providing solid justification as to why your chosen components are the most suitable compared to

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others. Citing more researched material would have helped here. Its mostly stating what things are, as opposed to WHY they were chosen. Lots of sources exist giving advice on minimum and recommended specifications – read them and cite them!

PRACTICAL APPLICATION



PSU a little over specced for Scenario1. Could have used more RAM for Scenario2. Also - needed 8GB disk space for the NAS unit. Otherwise, generally sensible options.

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TRANSFERABLE SKILLS



Reasonably well presented

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