BUILD / ASSEMBLE A BUDGET PC

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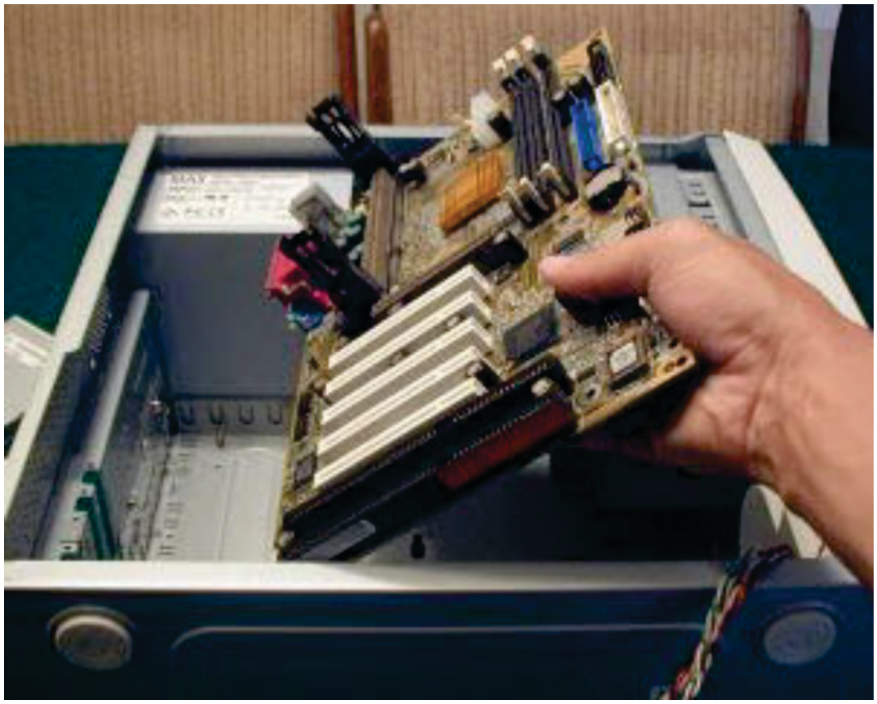


In this chapter, you will learn how to :

- Determine Functional Requirements
- Know Component Considerations
- Build the Budget System

Inexpensive doesn't have to mean cheap. This chapter exposes you on how to save money particularly using the Budget System that can really save money in building your own PC. Matching the price of a mass-market commercial system with a home-built system that uses higher quality components is easy, nevertheless, it is not recommended to match the quality level of a mass-market commercial system by buying the cheapest components available in the market. There are a good number of reasons to build inexpensive systems but no reasons at all to build cheap systems.

Build / Assemble a Personal Computer — Lesson 1

The idea of building a PC intimidates many people, but there's really nothing to worry about. Building or assembling a PC is no more technically challenging than changing the oil in your motorcycle or hooking up a DVD player into your television. Compared to assembling one of those big lego blocks or toys for the kids, it is absolutely a challenging task.

PC components connect like building blocks. Component sizes, screw threads, mounting hole positions, cable connectors, and so on are mostly standardized, so you need not to worry about whether something will fit. There are minor exceptions, of course. For example, some small cases accept only micro-ATX motherboards and half-height or half-length expansion cards. There are also some important details to pay attention to. You must verify, for example, that the motherboard you intend to use supports the processor you plan to use. But overall, there are few "gotchas" involved in building a PC. If you have read the previous chapters, everything will fit and everything will work together.

Component Considerations

With our design criteria in mind, we set out to choose the best components for the PC system. The following sections describe the components we chose, and why we chose them.

Case and Power Supply (Budget: 1,900)

Antec NSK-4482 Mid-Tower Case

It's easy to spend too little on the case and power supply for a budget system. Unfortunately, the price of a decent case and power supply has risen significantly over the last few years, probably because of the financial crisis here in our country. A couple of years ago, models suitable for a budget system sold in the 1,200 to 1,500 range. Equivalent cases now sell in the 1,900 to 2,500 range, which takes a larger bite out of the budget.

Casing (3/4 and side view)

In that price range, we think the Antec NSK-4482 is the best choice. It's very attractive, and the bundled Earth Watts 600 power supply is perfectly acceptable. Other suitable cases in that price range are the ThermalTake Element T and the Antec NSK-3480.

Processor and CPU Cooler (Budget: 3,600)

AMD A8 7600 series processor with Heatsink+fan

We would like a quad-core processor, but with only about 2,900.00 allocated budget to the processor, our choices are realistically limited to single- and dual-core "value" processors. Intel sells several models in this price range, but peso-for-peso in value processors, AMD models offer more bang for the buck than Intel models. At the time we purchased the processor for this system, the 2,900.00 retail-boxed AMD A8 series processor was clearly the best processor for the money.

AMD Processor and Fan+Heatsink

Motherboard (Budget: 4,500)

ASRock K10N78M-PRO

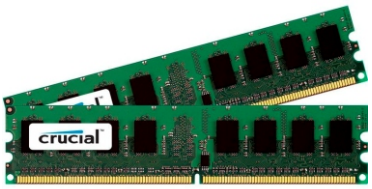
The AMD A8 7600 processor is a Socket AM3 processor, so the first selection criterion for a motherboard in the 4,300 range was Socket AM3 compatibility, which either a hybrid Socket AM2+/AM3 model or a pure Socket AM3 model provides. (A hybrid motherboard can use either a Socket AM2+ or a Socket AM3 processor; an AM3 motherboard can use only a Socket AM3 processor.) Note that socket compatibility is only a first-cut criterion. Just because a motherboard supports Socket AM3 processors doesn't necessarily mean it supports the specific Socket AM3 processor you want to use.

Motherboard(top view)

Memory (Budget: 1,900)

Crucial CT2KIT12864AA667 2 GB Kit (4 GB x 2)

The budget system in the preceding edition was equipped with a single-core processor and 512 MB of RAM. Although that was sufficient for snappy performance with Linux or Windows XP, it was marginal for Vista. Windows 7 resource requirements are at least as high as those of Vista, so if you plan to run Windows 7 on your budget system, you'll want at least 1 GB per core, for a total of 2 GB. That's assuming you're running 32-bit Windows 7. If you plan to run the 64-bit version, double the memory requirements.



Memory cards(Brand:Crucial)

Video Adapter (0)

Integrated NVIDIA GeForce 8200

The NVIDIA GeForce 8200 video integrated on the ASRock motherboard provides excellent 2D display quality and reasonably good 3D performance for casual gaming and similar tasks. The ASRock motherboard includes a PCI Express x16 video adapter slot, so if necessary we can upgrade the video down the road by installing an inexpensive PCIe video adapter. We don't expect that to be necessary, but if we decide we need more video horsepower than the GeForce 8200 provides, even a 1,800 standalone video adapter is likely to be more than sufficient.

On-board/Integrated video card

Hard Disk Drive (3,400)

Seagate Barracuda 2 Terabyte(TB)

If we were attempting to cut costs to the bone, we might have chosen a lowcapacity hard drive. But when we bought our components, 1Terabyte(TB) drives were selling for 2,900 versus 3,400 for the 2 Terabyte(TB) Seagate. We decided it made sense to spend the extra 500 to jump from1TB to 2TB. That additional cost is significant for a system with a base budget of 25,000 but the extra 500 buys double the disk space. Even on a budget system, we'd soon be cramped with only 1TB of disk space.

We've been using Seagate hard drives almost exclusively for many years and have always found them to be fast, quiet, cool-running, reliable, and competitively priced.

Hard disk drive

Optical Drive (1,500)

ASUS DRW-24B1ST DVD writer

DVD burners are so inexpensive nowadays that they make little sense to save 900 by installing a read-only DVD-ROM drive. If nothing else, you'll want the writer to back up your system. Among the many inexpensive DVD writers available, we chose the ASUS DRW-24B1ST for its combination of features, performance, reliability, and price. Similar models from LiteOn or Samsung are also good choices.

DVD writer(Brand:Asus)

Keyboard and Mouse (420)

Logitech Deluxe 250 Desktop

Personal preference outweighs all else when choosing a keyboard and mouse. So many personal factors determine usability that no one can choose the "best" keyboard and mouse for someone else.

That said, we had to pick a "budget" keyboard and mouse for our budget system. We wanted something in the sub 600 range that included a decent keyboard and a reliable optical mouse. Our favorite among inexpensive keyboard/mouse combos is the Logitech Deluxe 250 Desktop, for which we paid 420.

Mouse and keyboard

Speakers (1,200)

Logitech LS11

Display speakers are generally small and produce only 0.5W to 1W per channel. That's acceptable for most uses, including watching videos and so on. The 1,200 standalone units provide somewhat better sound but about the same wattage. We opted for speakers embedded in the display for our budget system.

Speaker

Display (3,800)

18.5" Acer VW193TR

In the preceding edition, we allocated 4,500 to the display and recommended three 17" LED models from AOC, Samsung, and ACER. Nowadays, 4,500 buys you a lot more display. The entry level for LED displays is now a 18.5" 1366×768 model. (There are smaller displays available, but they generally cost the same as a 18.5" model, if not more.) Basic models suitable for a budget system cost 3,800 to 4,500. In the 6,000 to 7,500 range, you can buy a 22" model with 1920x1080 resolution, a nice step up. You're likely to be happy with any of the models listed above, or their successors. Note that some models include speakers and others do not.

18.5" ACER LED Monitor

Component Summary

The table below summarizes our component choices for the budget system. Not counting shipping, sales tax, or software, the total for the budget system came to 25,000. With display, the budget system costs 4,300, give or take. Not bad for a fully equipped system. We could have made small economies here and there to reduce the price further. For example, we might have saved 1,300 by buying a really cheap case (although we'd still have installed a 1,900 Antec Earth-Watts 600 power supply, or something similar). We could have saved 950 on the motherboard by accepting less capable integrated video and another 1,000 by using a slow single-core processor. Substituting a smaller hard drive might have saved us another 850, and we could have cut maybe 250 from the total by using a DVD-ROM drive rather than a DVD writer. All told, we might have gotten the cost of our budget system down into the 21,000+ range, but we feel that would have been a false economy.

Component	Product
Case	Antec NSK-4482 Mid-Tower Case
Power supply	Antec EarthWatts 380W (bundled)
Motherboard	ASRock K10N78M-PRO
Processor	AMD A8 7600
CPU cooler	(Bundled)
Memory	Crucial CT2KIT12864AA667 2 GB Kit (1 GB x 2)
Video adapter	(Integrated NVIDIA GeForce 8200)
Hard disk drive	Seagate Barracuda (2TB)
Optical drive	ASUS DRW-24B1ST DVD writer
Keyboard and mouse	Logitech Deluxe 250 Desktop
Speakers	Logitech LS11 (or embedded display speakers)
Display	18.5" ACER LED Monitor

Bill of materials

Chapter 3
Laboratory Manual

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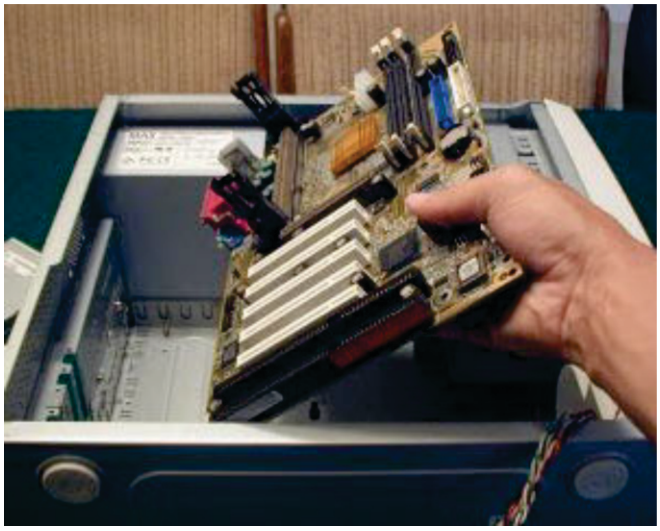

Laboratory Activities

3.01 Building a Thick Client
3.02 Replacing a Power Supply
3.03 Removing and Installing a CPU
3.04 Removing and Installing a RAM
3.05 Installing a Motherboard
3.06 Installing a Videocard
3.07 Installing a SATA Hard Drive
3.08 Installing a DVD Drive

Chapter Analysis and Written Test

Lab Activity 3.01 Building a Standard PC

A budget or standard PC uses good-quality components throughout, but those components fall on the low end of the performance range. They may even be a generation or two out of date. That's not necessarily a bad thing, though: last year's models are every bit as good this year as they were 12 months ago, and you can save a lot of money if you don't insist on the very latest components.

In pursuit of low prices, we don't hesitate to buy components that are discontinued and on sale. There are few disadvantages to doing so. Discontinued products nearly always carry the full manufacturer warranty and function as well as they did when they were the latest and greatest products available.

Learning Objectives

In this exercise, you'll research what it takes to create a standard PC.

At the end of this lab, you'll be able to

- find parts for a standard PC client by using the Internet or from your local PC stores

Lab Materials and Setup

The material you need for this lab is

- an Internet-capable PC for research

Let's Get the Lab Started

Learning about all the different aspects of computing. You've seen everything from microprocessors to power supplies, from Microsoft Windows to video cards. Now it's time to put all that experience to the test. You will research the parts for a fully functional thick client. Here is the list of criteria your PC must meet to qualify as a thick client:

a. Runs the latest Windows operating system
b. Runs standard desktop applications such as Microsoft Office and Internet Explorer
c. Network connectivity
d. Storage (SSD or HDD)
e. Monitor
f. Keyboard and mouse

Step 1 Open a Web browser and visit a Web site from which you can purchase computer parts. Suggestions include:

a. www.newegg.com
b. www.tigerdirect.com
c. www.cdw.com

Your instructor will set a price limit for you. You don't want to make a high-end gaming machine at least not yet! If this is a self-guided course, then set a limit of P25,000.00. That should keep you in the realm of the standard PC.

Step 2 Shop for the parts listed in the following table and complete the other columns for each component you choose.

Part	Model/Version	Web Site/Store	Price
Motherboard			
CPU			
RAM			
Hard Drive			
Optical Drive			
Power Supply			
Case			
Monitor			
Keyboard			
Mouse			
Windows OS			
Video card(optional)			

Step 3 Add up all the prices for your parts.