

Using FreeDOS

24th anniversary e-book

by
Jim Hall

Shareen Mann (ed.)

August 2018

Using FreeDOS is licensed under the
[Creative Commons Attribution 4.0 International Public License](#)

For more information, visit our website:
[The FreeDOS Project](#)

Introduction.....	3
1. Installing FreeDOS.....	5
How to Install FreeDOS.....	6
How to Install FreeDOS on a Virtual Machine.....	14
Using FDIMPLES.....	21
A Gentle Introduction to FreeDOS.....	26
2. Running Applications.....	34
As-Easy-As.....	35
Quattro Pro.....	43
VisiCalc.....	47
WordPerfect.....	52
WordStar.....	55
Why Screenshots Look Weird.....	58
3. History.....	64
The Origin and Evolution of FreeDOS.....	65
History of the FreeDOS Kernel.....	69
History of the FreeDOS Distributions.....	72
History of the FreeDOS Logo.....	77
History of the FreeDOS Website.....	81
FreeDOS Quick Reference.....	94
FreeDOS Commands.....	95
Batch Programming.....	98
Thank You.....	100

Introduction

In the early 1990s, I was a DOS power user. I used DOS for everything and even wrote my own tools to extend the DOS command line. Sure, we had Microsoft Windows, but if you remember what computing looked like at the time, Windows 3.1 was not that great. I preferred working in DOS.

You might understand that I was a little confused and upset in 1994 when Microsoft announced (via interviews in tech magazines) that the next version of Windows would do away with MS-DOS. I looked around for options and decided that if DOS was going to continue, someone would have to create a DOS everyone could use when MS-DOS went away.

So it was on June 29, 1994, that I wrote a message to a Usenet discussion group, announcing a new “free DOS” project.

It’s 24 years later, and FreeDOS is still going strong!

We continue to make new releases with new functionality and features. Our FreeDOS 1.2 distribution, released on December 25, 2016, is a testament to how many people enjoy using and working on FreeDOS. As I look back over our history, there’s a short list of cool facts about FreeDOS you should know.

FreeDOS provides software development right out of the box

With the original DOS, it was difficult to do any coding. DOS provided a simple BASIC interpreter, and some people could do neat things with DEBUG, but you couldn’t really do much programming in DOS. With FreeDOS, there are a bunch of different tools to do software

development: compilers, assemblers, debuggers, interpreters, and scripting. After you install FreeDOS, you can immediately start writing code in C, Assembly, Pascal, Perl, and several other languages.

You can browse the web

DOS is an old system and the original didn't support networking out of the box. Typically, you had to install device drivers for your hardware to connect to a network, which was usually a simple network like IPX. Few systems supported TCP/IP.

With FreeDOS, not only do we include a TCP/IP networking stack, we include tools and programs that let you browse the web. Use Dillo for a graphical web browser experience, or Lynx to view the web as formatted plain text. If you just want to grab the HTML code and manipulate it yourself, use Wget or Curl.

You can play great DOS games

We know that many people install FreeDOS today to play the classic DOS games, run legacy business applications, or do embedded development. A lot of those people use FreeDOS just to play games, and that's cool with us. Just because a game is old doesn't mean it's boring. DOS had a lot of great games! Install your favorite classic game and have fun.

Because so many people use FreeDOS to play games, we now include a variety of DOS games. The FreeDOS 1.2 distribution includes first-person shooters like FreeDOOM, arcade shooters like Kiloblaster, flight simulators like Vertigo, and others. We aimed to include something for everyone.

FreeDOS has been around longer than MS-DOS

Microsoft released MS-DOS 1.0 in August 1981. And thirteen years later, Microsoft effectively deprecated MS-DOS with the release of Windows 95 in August 1995, although MS-DOS was still around in some form until September 2000. In total, MS-DOS was a thing for nineteen years.

We announced FreeDOS in June 1994 and made our first alpha release in September that same year. So FreeDOS has been around for 24 years, edging out Microsoft's MS-DOS by a few years. Truly, we've been working on FreeDOS for longer than MS-DOS was a thing. FreeDOS has staying power.

Another important way that FreeDOS is different from other versions of DOS, is that it is still being developed. We have an active developer community and are always looking for new people to help out. Join the community and help build the next version of FreeDOS.

1. Installing FreeDOS

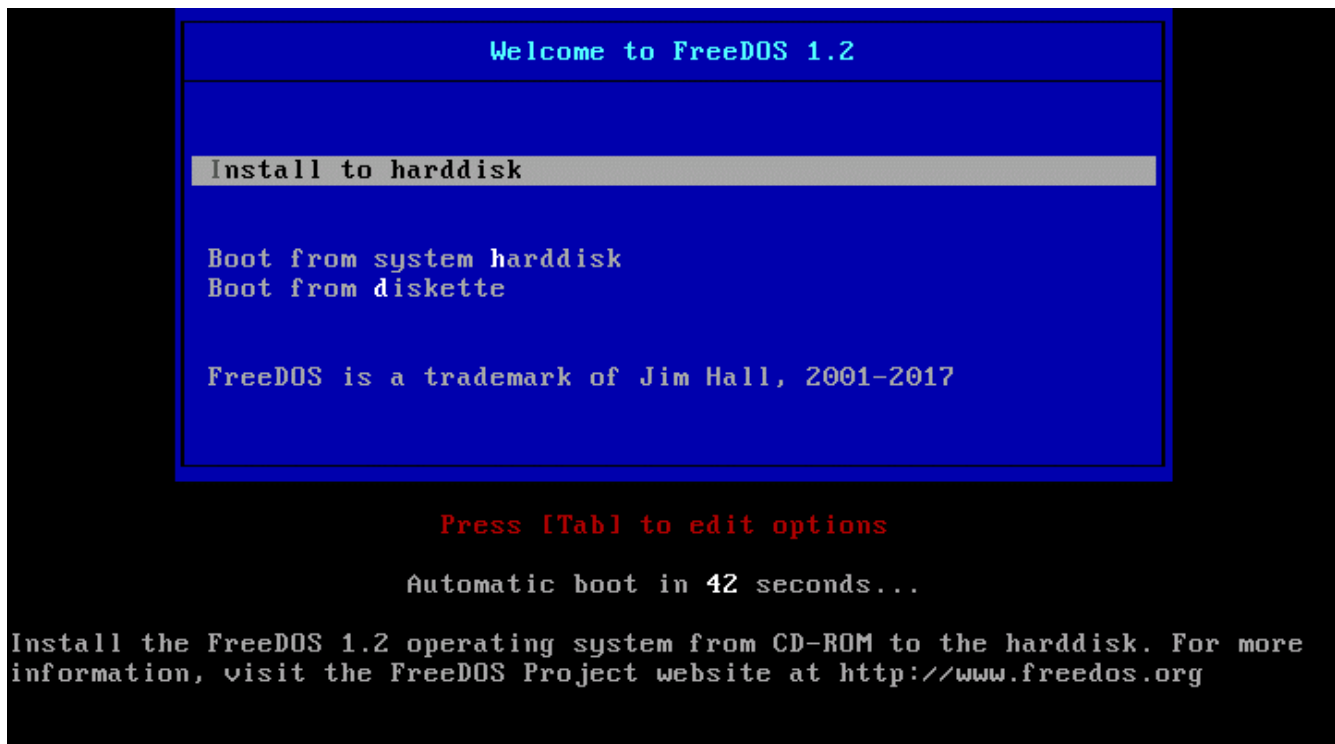
How to Install FreeDOS

You may know that FreeDOS is a DOS-compatible operating system for personal computers. You can use FreeDOS to play classic DOS games, run legacy business software, or develop embedded PC applications. Any program that works on MS-DOS should also run on FreeDOS.

To make installation easier, we've provided the FreeDOS 1.2 distribution in several formats, including a bootable CD-ROM. Most users opt to install FreeDOS using the CD-ROM image. Note that when installing FreeDOS, you will need to set your system to boot from CD-ROM before the hard drive, allowing the FreeDOS install CD-ROM to boot first.

Need some help installing FreeDOS 1.2 on your computer? Here is a [step-by-step guide to install FreeDOS](#).

The CD-ROM installer gives you a menu. You can choose to install FreeDOS, or boot from the system hard disk or from a diskette.

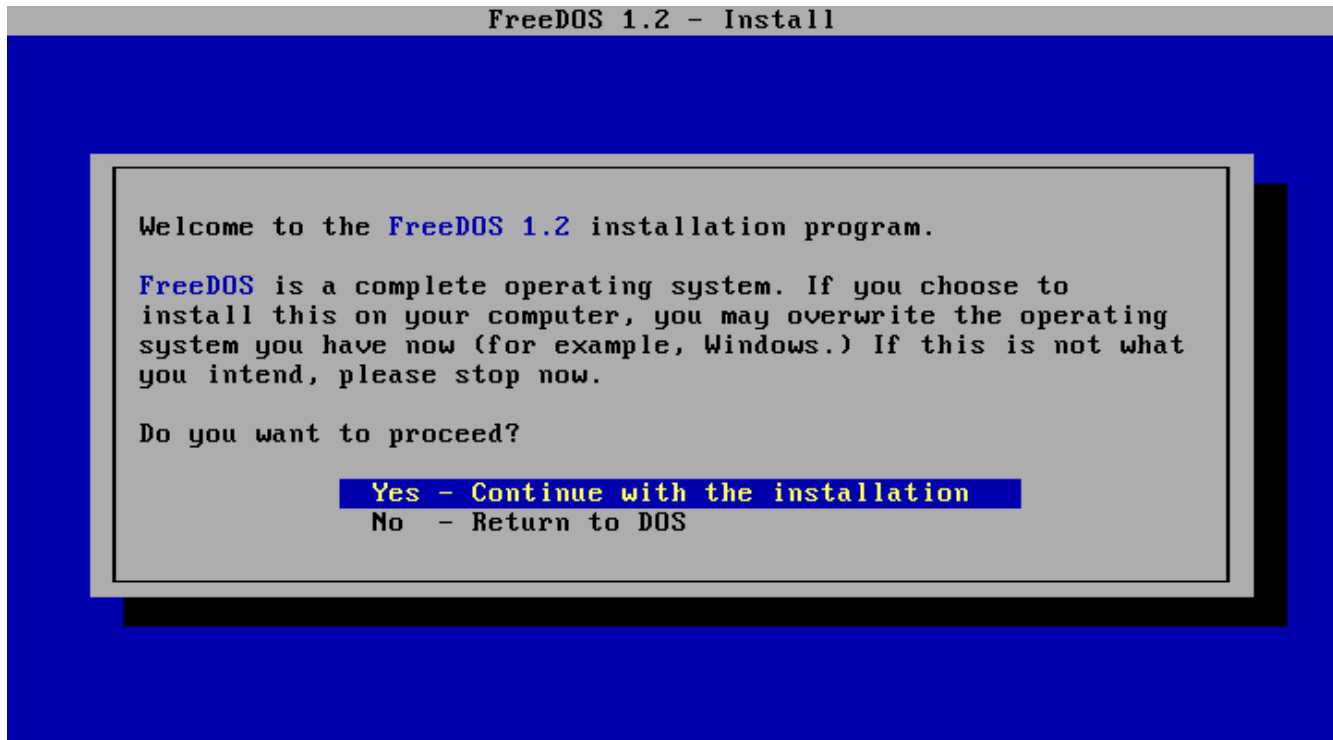


The default language is English, but the installer supports other languages.

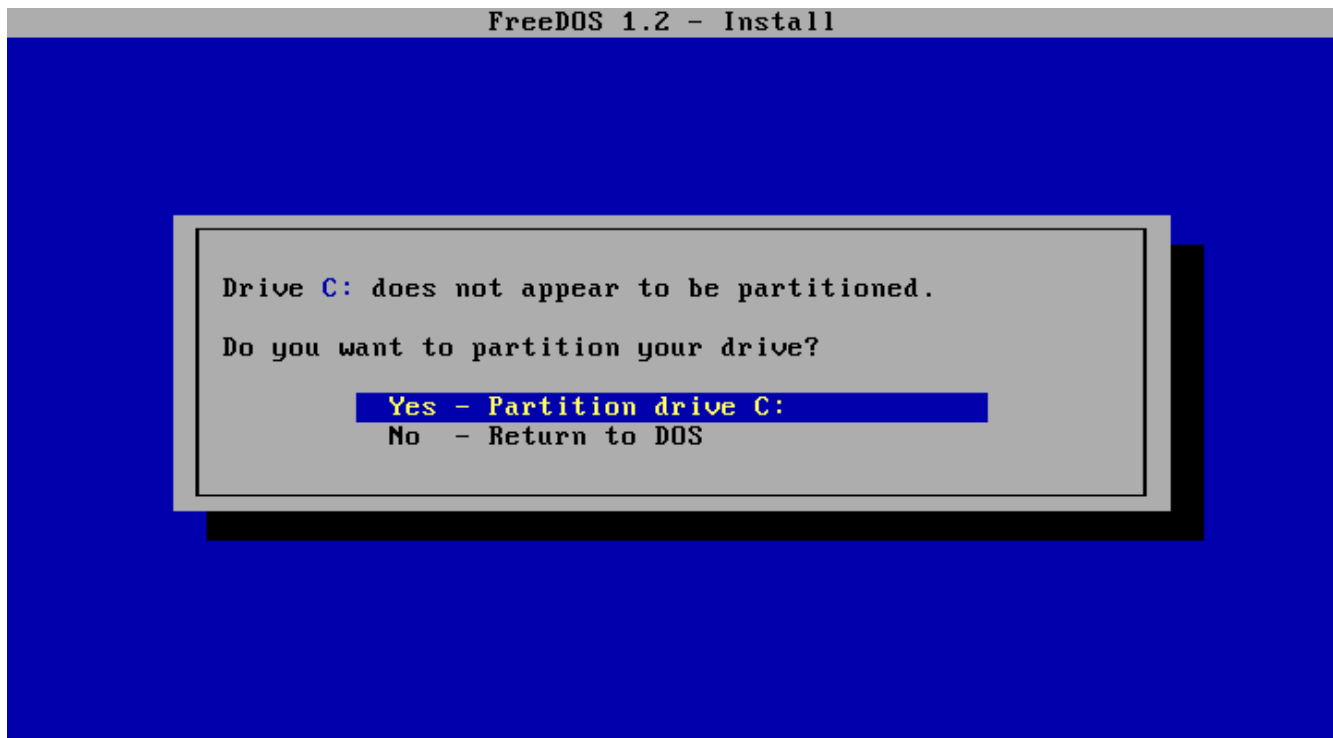


Welcome to the FreeDOS 1.2 install program. We provide a standard warning here. For new users, we recommend installing FreeDOS in a PC emulator or "virtual machine." If you install FreeDOS on a computer directly, without using a PC emulator, you may overwrite the operating system you

have now (for example, Windows). That's why we include a brief message about that in the FreeDOS distribution.



The installer will detect if your **C:** drive isn't partitioned for DOS and will automatically use the FDISK program to partition your disk.



Just follow the prompts. Select **1** to create the DOS partition. This will be your **C:** drive. Follow the other prompts to create the primary DOS partition. Note that if you don't use all free space to create your FreeDOS partition, you may need to mark the new partition as the Active partition, so FreeDOS can boot from it.

```
                Create Primary DOS Partition

Current fixed disk drive: 1

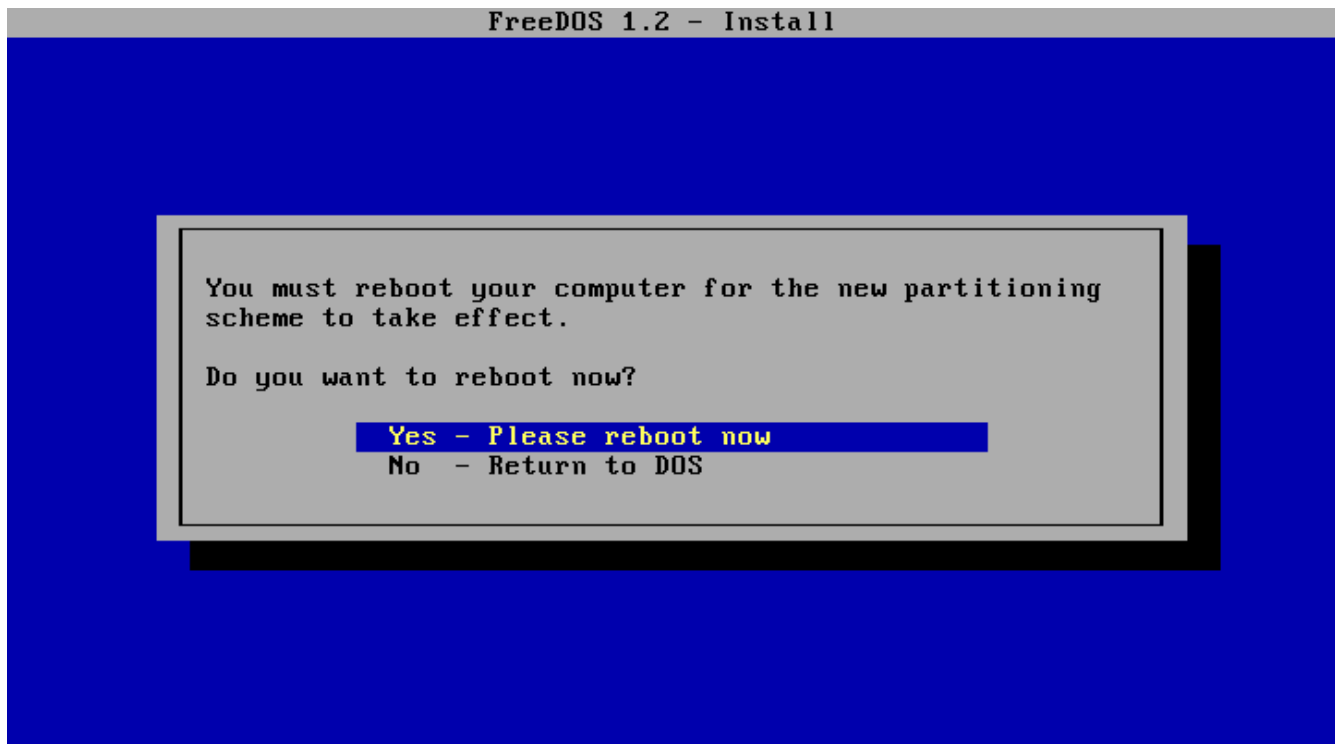
Partition  Status  Type   Volume Label  Mbytes  System  Usage
C: 1      A      PRI DOS                200     FAT16   100%

Total disk space is    200 Mbytes (1 Mbyte = 1048576 bytes)

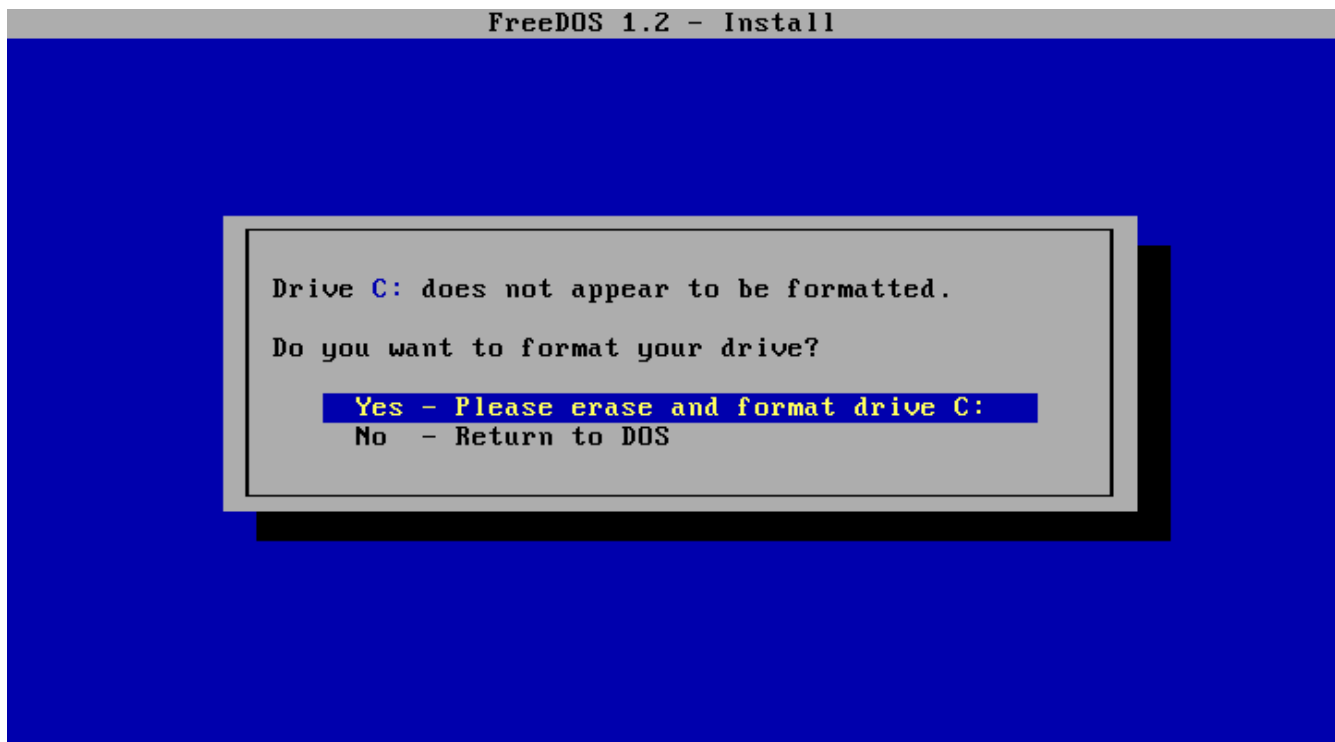
Primary DOS Partition created

Press Esc to continue_
```

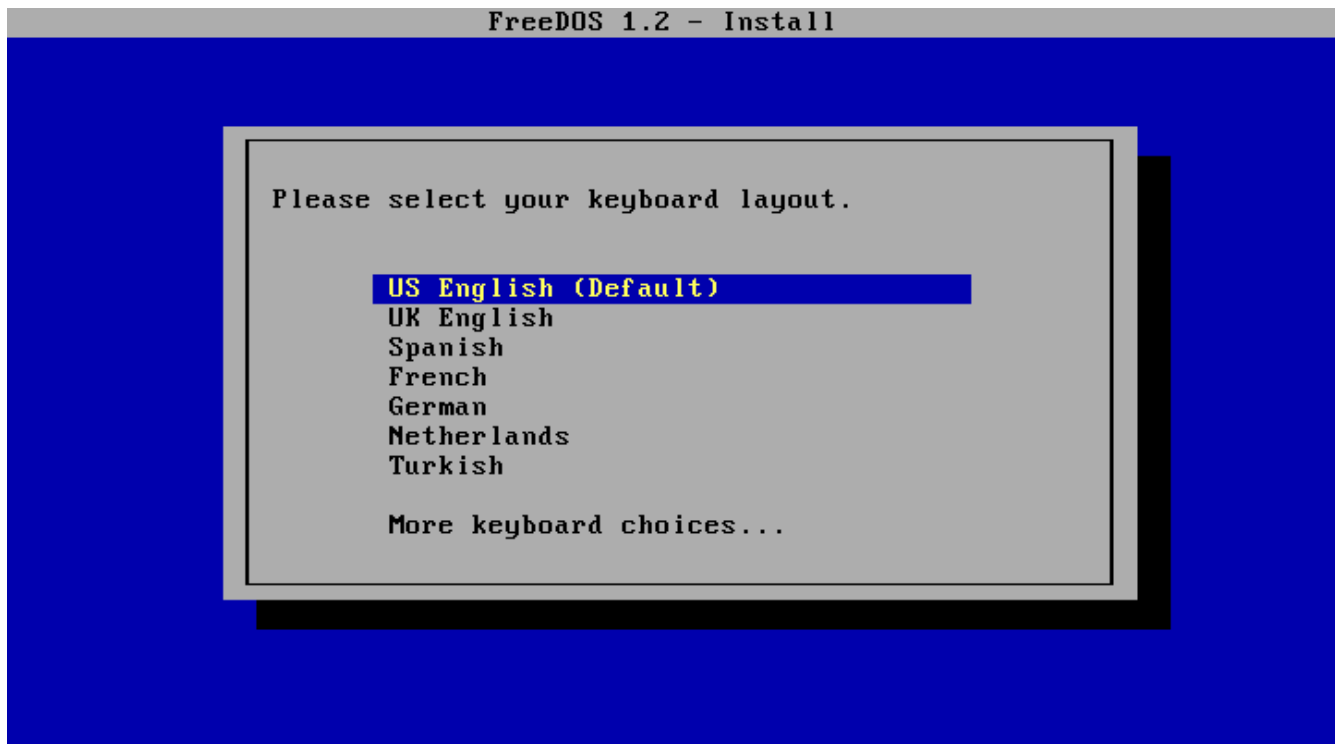
After you partition your hard drive, you need to reboot for FreeDOS to see the changes. Press **ESC** to exit FDISK. The FDISK program and the installer will warn you that you need to reboot your computer for the changes to take effect. The FreeDOS installer has an option to reboot your computer for you, so just use that.



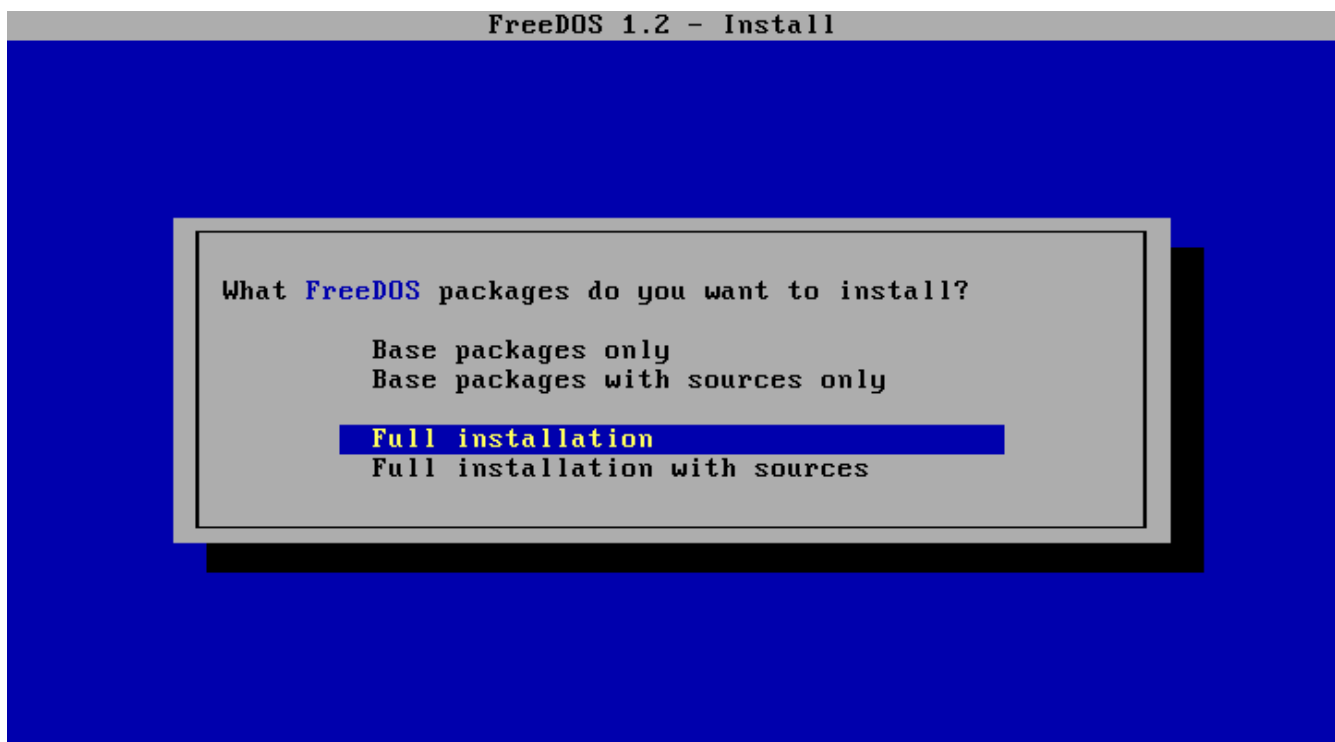
After rebooting, the installer starts up again automatically. If your **C:** drive isn't formatted for DOS, the installer automatically detects that and can format it for you.



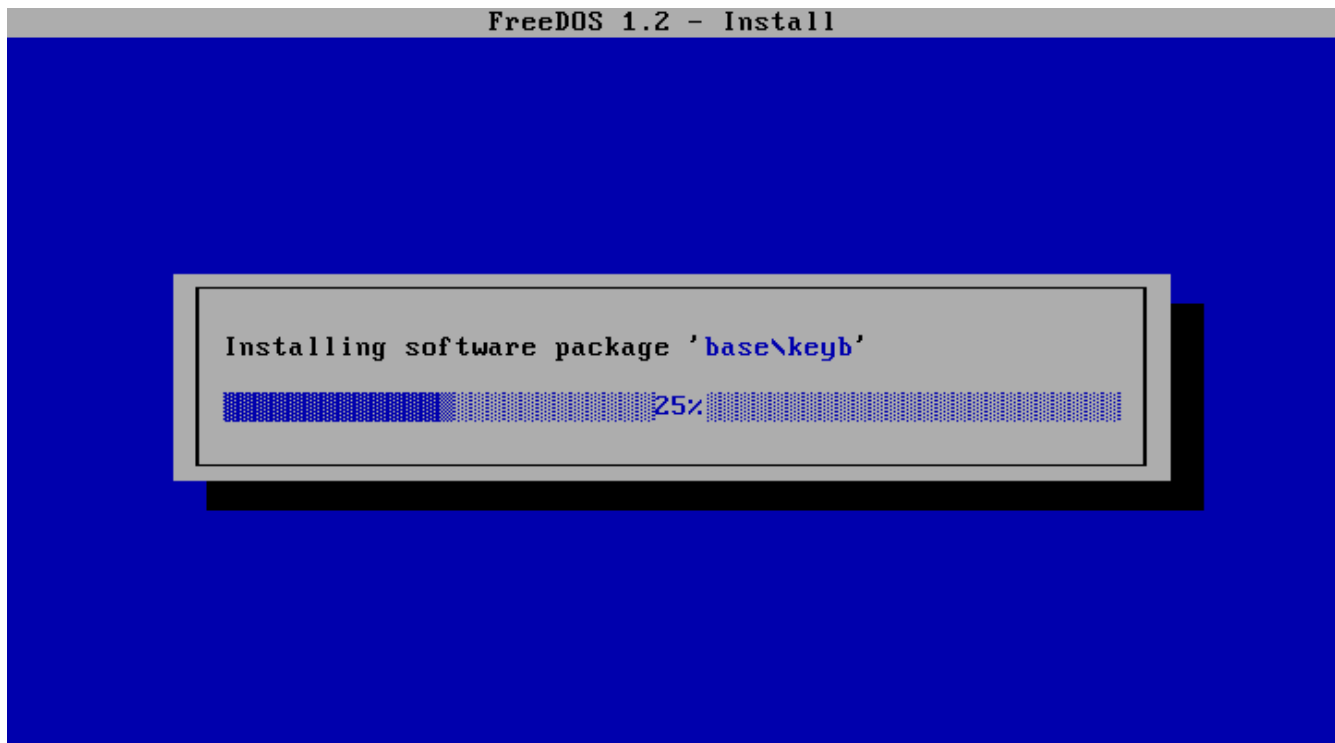
Your preferred language might not match your keyboard language, so we let you select your keyboard layout separately.



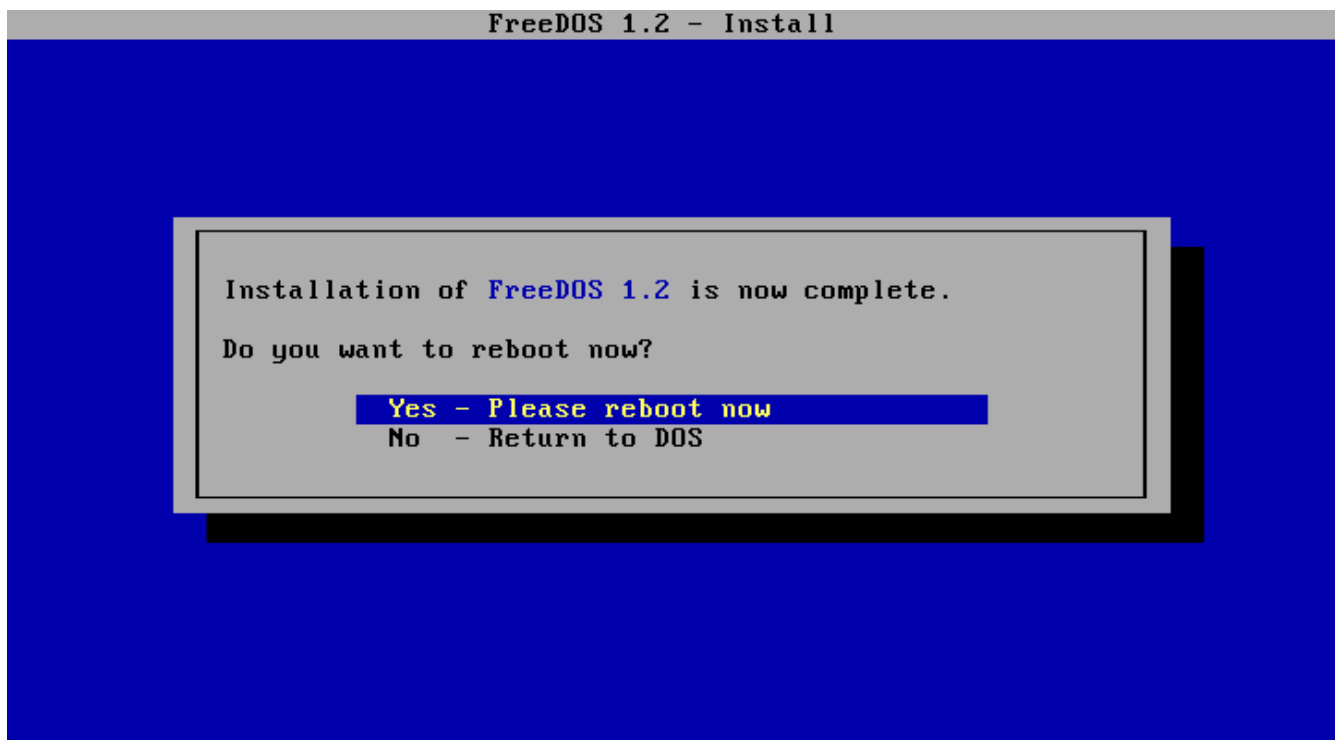
The FreeDOS 1.2 installer has two default install modes: install only those packages that reproduce the functionality of classic DOS (Base), or install everything (Full). Because FreeDOS is open source software, we give you the option to install source code, too.



Then just sit back and let the installer do its thing. The installer will let you know when it has finished installing FreeDOS. Depending on what you chose to install and the speed of your system, the install usually takes a few minutes.



Finally, reboot your system to begin using FreeDOS.



```
Modules using memory below 1 MB:
```

Name	Total		Conventional		Upper Memory	
-----	-----	-----	-----	-----	-----	-----
SYSTEM	16,784	(16K)	10,480	(10K)	6,304	(6K)
COMMAND	4,064	(4K)	0	(0K)	4,064	(4K)
UDUD2	2,000	(2K)	0	(0K)	2,000	(2K)
FDAPM	928	(1K)	0	(0K)	928	(1K)
CTMOUSE	3,104	(3K)	0	(0K)	3,104	(3K)
SHSUCDX	11,008	(11K)	0	(0K)	11,008	(11K)
Free	722,144	(705K)	643,552	(628K)	78,592	(77K)

```
Drives Assigned
```

```
Drive Driver Unit
D: FDCD0001 0
E: FDCD0001 1
1 drive(s) available.
```

```
Done processing startup files C:\FDCONFIG.SYS and C:\AUTOEXEC.BAT
```

```
Type HELP to get support on commands and navigation.
```

```
Welcome to the FreeDOS 1.2 operating system (http://www.freedos.org)
```

```
C:\>
```

Congratulations! You've installed FreeDOS on your computer. You'll find that FreeDOS is a simple yet powerful operating system that gives you full access to your computer. Depending on your interests, you can use this standard install to do different things with your system.

How to Install FreeDOS on a Virtual Machine

Like any DOS, FreeDOS requires an Intel x86 CPU and a BIOS to provide basic runtime services. That means you can run FreeDOS on pretty much any computer. As long as your computer has an Intel-compatible processor and a BIOS, FreeDOS should run fine. Some newer computers no longer provide a classic BIOS, instead using UEFI. These systems often provide a legacy option to emulate a BIOS. If your computer uses UEFI, check your computer's settings in the boot menu to activate the legacy BIOS mode.

Many users want to run FreeDOS on a computer that already has Windows or Linux. For these users, we recommend running FreeDOS through PC emulation. Maybe that's not as cool as running FreeDOS natively, but it's a great way to run DOS applications alongside other applications.

What about DOSBox?

Some might ask, "Why not use DOSBox instead?" DOSBox is an open source x86 emulator that runs on a variety of systems, including Linux. It is a great system that provides a DOS-like environment, mostly aimed at running games. So if you just want to run a classic DOS game, DOSBox can do that for you. But if you run want to run DOS applications, DOSBox isn't the best platform. And if you ask the DOSBox forums, they'll tell you DOSBox is really meant for games.

For most users, it's a matter of preference. It shouldn't be a surprise that I prefer to install FreeDOS to run classic DOS games and other programs. I find the full DOS experience gives me

greater flexibility and control than running DOSBox. I use DOSBox for a few games, but for most things I prefer to run a full FreeDOS instead.

Installing FreeDOS on a virtual machine

You can easily install FreeDOS on any PC emulator or virtual machine. Whether you use VirtualBox, QEMU, GNOME Boxes, PCem, or some other PC emulator, the steps are the same:

1. Set up a virtual disk for FreeDOS to use
2. Boot the FreeDOS install CD-ROM
3. Install FreeDOS

For this example, I'll use the QEMU emulator. QEMU (Quick EMUlator) is an open source virtual machine software system that can run DOS as a "guest" operating system on Linux, Windows, or Mac. The steps to install and run FreeDOS using QEMU are basically the same as on any PC emulator.

Let's start by defining a virtual disk image that we'll use to install and run DOS. The `qemu-img` command lets you create virtual disk images that QEMU uses for the PC emulator. On another PC emulator, you might create a virtual disk using a menu. FreeDOS is a small operating system, so you won't need much room. I created my virtual disk with 200 megabytes using this command:

```
qemu-img create freedos.img 200M
```

Compared to modern computing, 200 megabytes may seem small, but that's more than enough to install and run DOS, and several applications.

Unlike PC emulator systems like VMWare or VirtualBox, you need to build your virtual system by instructing QEMU to add each component of the virtual machine. Although this may seem tedious, it's actually pretty easy. Here are the parameters I use to boot FreeDOS inside QEMU:

```
qemu-system-i386
```

QEMU can emulate several different systems, but to boot DOS, we'll need to have an Intel-compatible CPU. For that, start QEMU with the `i386` command.

`-m 16`

I like to define a virtual machine with 16MB of memory. That may seem small, but DOS doesn't require much memory.

`-k en-us`

Technically, the `-k` option isn't necessary, because QEMU should set the virtual keyboard to match your actual keyboard (in my case, that's English in the standard US layout), but I like to specify it anyway.

`-rtc base=localtime`

Every classic PC provides a real time clock (RTC) so the system can keep track of time. I set the virtual RTC to match the local time.

`-soundhw sb16,adlib`

If you need sound, especially for games, I prefer to define QEMU with SoundBlaster16 sound hardware and AdLib Music support. SoundBlaster16 and AdLib were the most common audio hardware for DOS systems, so they work pretty much everywhere.

`-device cirrus-vga`

To use graphics, I like to emulate a simple VGA video card. The Cirrus VGA card was a common graphics card at the time, and QEMU can emulate it.

`-hda` and `-cdrom`

QEMU borrows the Linux device naming convention, so use `-hda` to set the first hard drive image, and `-hdb`, `-hdc`, and `-hdd` to set the second, third, and fourth hard drive images. Similarly, you can assign the CD-ROM media using `-cdrom`.

`-boot order=`

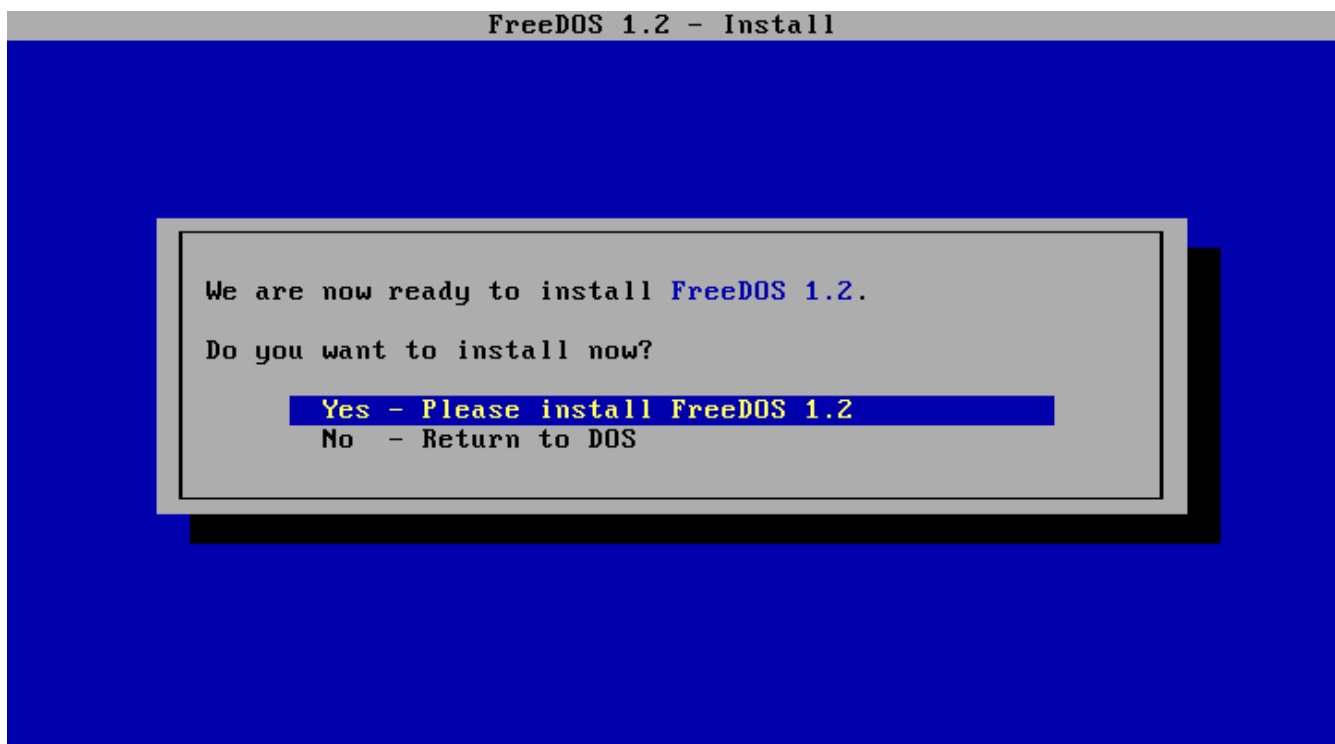
You can tell QEMU to boot the virtual machine from a variety of sources. To boot from the floppy drive, specify `order=a`. To boot from the first hard drive, use `order=c`. Or to boot from a CD-ROM drive, use `order=d`. You can combine letters to specify a specific boot preference, such as `order=dc` to first use the CD-ROM drive, then the hard drive if the CD-ROM drive does not contain bootable media.

I used these parameters to install FreeDOS on QEMU:


```
qemu-system-i386 -m 16 -k en-us -rtc base=localtime -soundhw  
sb16,adlib -device cirrus-vga -hda freedos.img -cdrom FD12CD.iso  
-boot order=d
```

In brief, the command line defines an Intel i386-compatible virtual machine with 16 megabytes of memory, a US English keyboard, and a real-time clock based on my local system time. The command line also defines a classic Sound Blaster 16 sound card, Adlib digital music card, and standard Cirrus Logic VGA card. The file **freedos.img** is defined as the first hard drive (**C:**) and the **FD12CD.iso** image as the CD-ROM (**D:**) drive. QEMU is set to boot from that **D:** CD-ROM drive.

The FreeDOS 1.2 distribution is easy to install. Just follow the prompts.



Running FreeDOS

After installing FreeDOS, you may prefer to boot directly from the virtual **C:** drive. Modify your QEMU command line to change the boot order, using `-boot order=c`, like this:

```
qemu-system-i386 -m 16 -k en-us -rtc base=localtime -soundhw  
sb16,adlib -device cirrus-vga -hda freedos.img -cdrom FD12CD.iso  
-boot order=c
```

The FreeDOS 1.2 distribution includes many games and other applications that might interest you. You may need to run the FDIMPLES package manager program to install these extra packages. My favorite game in FreeDOS 1.2 is WING, a space-shooter game that's very reminiscent of the classic arcade game Galaga (The name WING is a recursive acronym for WING is not Galaga).



One of my favorite DOS programs is the shareware As-Easy-As spreadsheet program. It was a popular spreadsheet application from the 1980s and 1990s, and does the same job Microsoft Excel and LibreOffice Calc fulfill today, or that the DOS-based Lotus 1-2-3 did back in the day. As-Easy-As and Lotus 1-2-3 both saved data as WKS files, which newer versions of Microsoft Excel can't read, but LibreOffice Calc may still support, depending on compatibility. While the original version of As-Easy-As was shareware, TRIUS Software made the activation code for As-Easy-As 5.7 available for free.

While you can run DOS on “bare metal” PC hardware, many users find it more convenient to install FreeDOS via a PC emulator. With QEMU or another PC emulator, you can easily install FreeDOS to play classic DOS games and run other DOS programs. Once you’ve set up QEMU as the virtual machine emulator and installed FreeDOS, you are all set to enjoy your favorite classic DOS programs on any system.

Using FDIMPLES

The FreeDOS software distribution originally started as a set of programs to replace the functionality of MS-DOS. We surpassed that goal a long time ago, and our Base install distribution replaces the original DOS. If you install the Full distribution, you get everything in Base plus a bunch of other FreeDOS programs that we find useful.

Programs in the FreeDOS distribution are included as “packages” that can be easily installed by the FreeDOS install program. Really, these are just standard zip files with a predictable directory layout, such as **BIN** for executable programs, **HELP** for any help files, **SOURCE** for original source code, and so on.

For the FreeDOS 1.2 distribution, we included the usual Base and Full packages, which you can install automatically as part of the FreeDOS 1.2 installer. We also included a bunch of extra programs. These are helpful programs that maybe not everyone will want to install, but we wanted to make available to you as part of the FreeDOS 1.2 distribution.

To install these extra packages, use the FDIMPLES program. FDIMPLES is a derivative of the FreeDOS installer, and stands for FreeDOS Installer—My Package List Editor Software. Make sure you have the FreeDOS 1.2 installation CD in your CD-ROM drive, then type **FDIMPLES** to start the program.

Installing a program

Let's walk through a simple program install. I like the game WING, so I'll use that as an example.

After you start FDIMPLES, you'll see a list of package sets on the left, and a list of packages from that set on the right. As you navigate through each package, you'll see the full package information below.

```
FreeDOS Installer - My Package List Editor Software 0.9.7 (FDIMPLES)
[+] Archivers
[X] Base
[ ] Boot Tools
[ ] Development
[+] Editors
[ ] Games
[ ] Networking
[ ] Sound
[ ] ARJ      The open-source ARJ archiver.
[X] BZ2      BZIP2 compression program
[ ] CABEXT   CABExtract can extract files from a variet
[X] GZIP     GNU zip compression - a file archiver tool
[ ] LHA      archiver working with LHA / LZH archives
[ ] LPQ1     lpq1 is a file compressor and archiver
[X] LZIP     A data compressor based on the LZMA algori
[X] LZMA     Works with .lzma compressed files (differe
ARJ (2.78)
GNU General Public License
The open-source ARJ archiver.
10 files (236 KBytes); 168 source files (1,433 KBytes)
appinfo/
appinfo/arj.lsm
bin/
bin/arj.exe
bin/arjdisp.exe
OK Cancel
76720/76720 D:\ARCHIVER\ARJ.ZIP
```

To install WING, navigate down to the Games package set, and press Tab to get to the list of packages. Scroll down to the WING package, and press the Space Bar to mark it with an **X**. This selects the package for installation.

```

FreeDOS Installer - My Package List Editor Software 0.9.7 (FDIMPLES)
[ X ] Base
[ ] Boot Tools
[ ] Development
[ + ] Editors
[ + ] Games
[ ] Networking
[ ] Sound
[ + ] Utilities
[ ] QTETRIS A clone of the TETRIS game, and a tribute
[ ] SNOVA Text based adventure game set in the futur
[ ] SUDOKU86 a 16-bit Sudoku game for DOS and 8086/8088
[ ] VERTIGO A flight simulator that focuses on realism
[ ] VITETRIS A terminal-based Tetris clone.
[ X ] WING A galaga-like space shooter.
[ ] WW1 A text based trivia game.
[ ] ZMIY A snake game (like Nibbles) for DOS and 80

Wing (0.7)
Adam Hiatt (cthulhu@grex.org), Anil Shrestra
GNU General Public License, Version 2

A galaga-like space shooter.

104 files (3,033 KBytes); 1 source file (785 KBytes)

appinfo/
appinfo/wing.lsm
games/
games/wing/

OK Cancel
62968/136208 D:\GAMES\WING.ZIP

```

You can select other packages, including packages from other package sets. When you're done, select **OK** at the bottom of the screen. FDIMPLES automatically installs the package or packages for you.

```

games\wing\images\fire09.bmp -> C:\games\wing\images\
games\wing\images\fire08.bmp -> C:\games\wing\images\
games\wing\images\fire07.bmp -> C:\games\wing\images\
games\wing\images\fire06.bmp -> C:\games\wing\images\
games\wing\images\fire05.bmp -> C:\games\wing\images\
games\wing\images\fire04.bmp -> C:\games\wing\images\
games\wing\images\fire03.bmp -> C:\games\wing\images\
games\wing\images\fire02.bmp -> C:\games\wing\images\
games\wing\images\fire01.bmp -> C:\games\wing\images\
games\wing\images\fire00.bmp -> C:\games\wing\images\
games\wing\images\fighter.bmp -> C:\games\wing\images\
games\wing\images\explode.dat -> C:\games\wing\images\
games\wing\images\enemy_to.bmp -> C:\games\wing\images\
games\wing\images\enemy_pl.bmp -> C:\games\wing\images\
games\wing\images\enemy_mi.bmp -> C:\games\wing\images\
games\wing\images\enemy_la.bmp -> C:\games\wing\images\
games\wing\images\enemy_bu.dat -> C:\games\wing\images\
games\wing\images\enemy.dat -> C:\games\wing\images\
games\wing\images\destroye.bmp -> C:\games\wing\images\
games\wing\images\bullets.dat -> C:\games\wing\images\
games\wing\images\bomber.bmp -> C:\games\wing\images\
games\wing\copying.txt -> C:\games\wing\
appinfo\wing.lsm -> C:\FDOS\appinfo\
Package wing installed: 104 files extracted, 0 errors.
C:\>

```

Removing a program

The steps to remove a program using FDIMPLES are basically the same as installing a program with FDIMPLES. To demonstrate, let's remove the WING game we just installed.

Again, when you start FDIMPLES, you'll see a list of package sets and packages.

```
FreeDOS Installer - My Package List Editor Software 0.9.7 (FDIMPLES)
[+] Archivers
[X] Base
[ ] Boot Tools
[ ] Development
[+] Editors
[+] Games
[ ] Networking
[ ] Sound
[ ] ARJ      The open-source ARJ archiver.
[X] BZ2      BZIP2 compression program
[ ] CABEXT   CABExtract can extract files from a variety
[X] GZIP     GNU zip compression - a file archiver tool
[ ] LHA      archiver working with LHA / LZH archives
[ ] LPQ1     lpq1 is a file compressor and archiver
[X] LZIP     A data compressor based on the LZMA algorithm
[X] LZMA     Works with .lzma compressed files (differs)

ARJ (2.78)
GNU General Public License

The open-source ARJ archiver.

10 files (236 KBytes); 168 source files (1,433 KBytes)

-----
appinfo/
appinfo/arj.lsm
bin/
bin/arj.exe
bin/arjdisp.exe
-----
OK          Cancel

76704/76704 D:\ARCHIVER\ARJ.ZIP
```

Navigate down to the Games package set, and press Tab to jump to the list of packages. Scroll down to WING, and press the Space Bar to remove the . This tells FDIMPLES to remove it.


```

FreeDOS Installer - My Package List Editor Software 0.9.7 (FDIMPLES)
[ X ] Base
[ ] Boot Tools
[ ] Development
[ + ] Editors
[ ] Games
[ ] Networking
[ ] Sound
[ + ] Utilities
[ ] QTETRIS A clone of the TETRIS game, and a tribute
[ ] SNOVA Text based adventure game set in the futur
[ ] SUDOKU86 a 16-bit Sudoku game for DOS and 8086/8088
[ ] VERTIGO A flight simulator that focuses on realism
[ ] VITETRIS A terminal-based Tetris clone.
[ ] WING A galaga-like space shooter.
[ ] WW1 A text based trivia game.
[ ] ZMIY A snake game (like Nibbles) for DOS and 80

Wing (0.7)
Adam Hiatt (cthulhu@grex.org), Anil Shrestra
GNU General Public License, Version 2

A galaga-like space shooter.

104 files (3,033 KBytes); 1 source file (785 KBytes)

appinfo/
appinfo/wing.lsm
games/
games/wing/
OK Cancel
20792/31776 D:\GAMES\WING.ZIP

```

You can select other packages to remove, but for this demonstration, I'll leave it with just the one package. Select **OK** at the bottom of the screen, and FDIMPLES automatically removes the package for you.

```

removing C:\games\wing\images\fire09.bmp
removing C:\games\wing\images\fire08.bmp
removing C:\games\wing\images\fire07.bmp
removing C:\games\wing\images\fire06.bmp
removing C:\games\wing\images\fire05.bmp
removing C:\games\wing\images\fire04.bmp
removing C:\games\wing\images\fire03.bmp
removing C:\games\wing\images\fire02.bmp
removing C:\games\wing\images\fire01.bmp
removing C:\games\wing\images\fire00.bmp
removing C:\games\wing\images\fighter.bmp
removing C:\games\wing\images\explode.dat
removing C:\games\wing\images\enemy_to.bmp
removing C:\games\wing\images\enemy_pl.bmp
removing C:\games\wing\images\enemy_mi.bmp
removing C:\games\wing\images\enemy_la.bmp
removing C:\games\wing\images\enemy_bu.dat
removing C:\games\wing\images\enemy.dat
removing C:\games\wing\images\destroye.bmp
removing C:\games\wing\images\bullets.dat
removing C:\games\wing\images\bomber.bmp
removing C:\games\wing\copying.txt
removing C:\FDOS\appinfo\wing.lsm
Package WING has been removed.
C:\>

```

A Gentle Introduction to FreeDOS

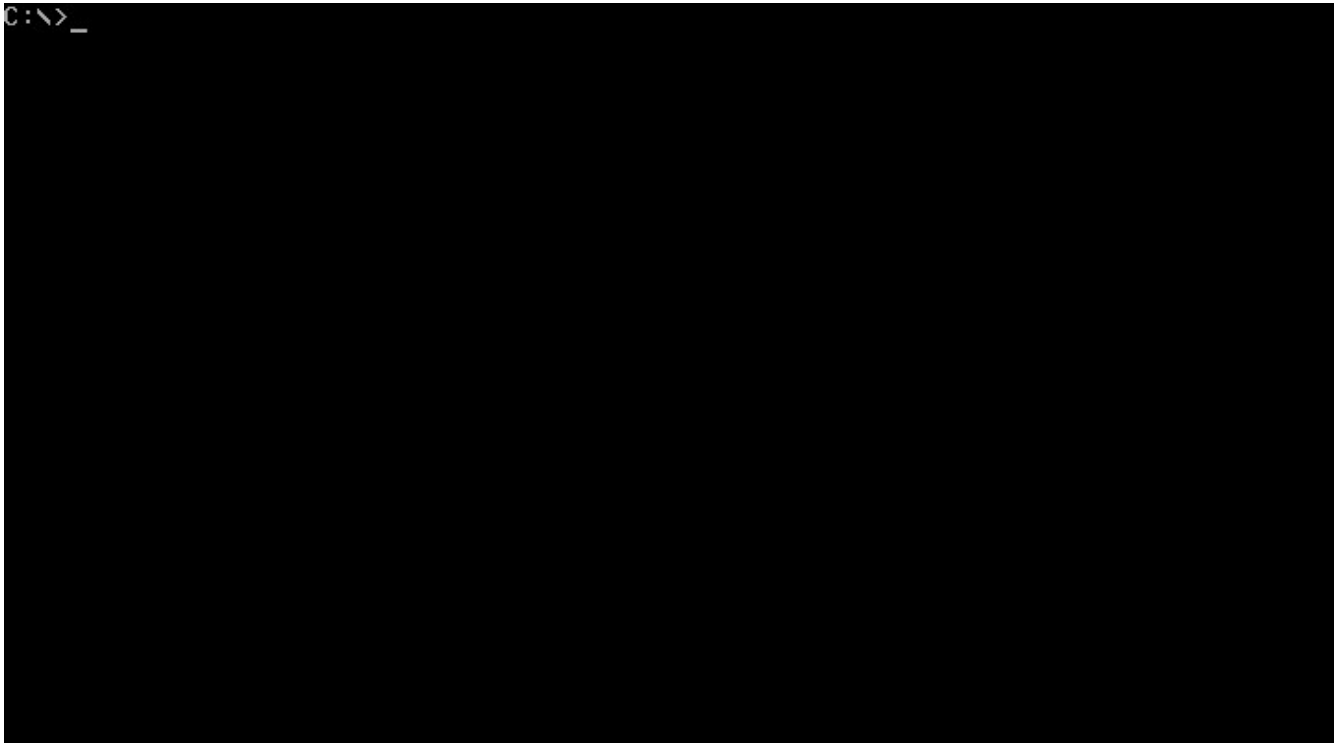
FreeDOS is an old operating system, but it is new to many people. In 1994, several developers and I came together to create FreeDOS—a complete, free, DOS-compatible operating system you can use to play classic DOS games, run legacy business software, or develop embedded systems.

In 1994, FreeDOS was immediately familiar to anyone who had used Microsoft's proprietary MS-DOS. FreeDOS mimicked MS-DOS as much as possible. As a result, DOS users in the 1990s were able to jump right into FreeDOS. But times have changed. Today, open source developers are more familiar with the Linux command line or they may prefer a graphical desktop like GNOME, making the FreeDOS command line seem alien at first.

New users often ask, "I installed FreeDOS, but how do I use it?" If you haven't used DOS before, the blinking `C:\>` DOS prompt can seem a little unfriendly, and maybe scary. This gentle introduction to FreeDOS should get you started. It offers just the basics: how to get around and how to look at files.

The DOS prompt

First, let's look at the empty prompt and what it means.



DOS is a “disk operating system,” created when personal computers ran from floppy disks. Even when computers supported hard drives, it was common in the 1980s and 1990s to switch frequently between the different drives. For example, you might make a backup copy of your most important files to a floppy disk.

DOS referenced each drive by a letter. Early PCs could only have two floppy drives, which were assigned as the **A:** and **B:** drives. The first partition on the first hard drive was the **C:** drive, and so on for other drives. The **C:** in the prompt means you are using the first partition on the first hard drive.

Starting with PC-DOS 2.0 in 1983, DOS also supported directories and subdirectories, much like the directories and subdirectories on Linux filesystems. Unlike Linux, DOS directory names are delimited by `\` instead of `/`. Putting that together with the drive letter, the `C:\` in the prompt means you are in the top, or “root,” directory of the **C:** drive.

The `>` is the literal prompt where you type your DOS commands, like the `$` prompt on many Linux shells. The part before the `>` shows the current working directory, and you type commands at the `>` prompt.

Finding your way around in DOS

The basics of navigating through directories in DOS are very similar to the steps you'd use on the Linux command line. You only need to remember a few commands.

Displaying a directory

When you want to see the contents of the current directory, use the `DIR` command. Since DOS commands are not case-sensitive, you could also type `dir`. By default, DOS displays the details of every file and subdirectory, including the name, extension, size, and last modified date and time.

```
C:\>dir
Volume in drive C is FREEDOS2016
Volume Serial Number is 1716-15E3
Directory of C:\

FDOS                <DIR>    08-12-2018  2:01p
AUTOEXEC.BAT        1,319    08-12-2018  2:08p
COMMAND.COM         66,945   08-28-2006 10:38p
FDCONFIG.SYS         762      08-12-2018  2:08p
KERNEL.SYS          46,685   05-11-2016  9:42p
      4 file(s)          115,711 bytes
      1 dir(s)          284,073,984 bytes free
C:\>_
```

If you don't want the extra details about individual file sizes, you can display a "wide" directory by using the `/w` option with the `DIR` command. Note that Linux uses the hyphen (`-`) or double-hyphen (`--`) to start command-line options, but DOS uses the slash (`/`).

```

C:\>dir /w
Volume in drive C is FREEDOS2016
Volume Serial Number is 1716-15E3

Directory of C:\

[FDOS]          AUTOEXEC.BAT  COMMAND.COM    FDCONFIG.SYS   KERNEL.SYS
              4 file(s)         115,711 bytes
              1 dir(s)       284,073,984 bytes free
C:\>_

```

You can look inside a specific subdirectory by passing the path name as a parameter to DIR. Again, another difference from Linux is that Linux files and directories are case-sensitive, but DOS names are not. DOS will usually display files and directories in all uppercase, but you can equally reference them in lowercase.

```

C:\>dir fdos
Volume in drive C is FREEDOS2016
Volume Serial Number is 1716-15E3

Directory of C:\FDOS

.                <DIR>  08-12-2018  2:01p
..               <DIR>  08-12-2018  2:01p
APPINFO          <DIR>  08-12-2018  2:01p
BIN              <DIR>  08-12-2018  2:01p
CPI              <DIR>  08-12-2018  2:02p
DOC              <DIR>  08-12-2018  2:01p
HELP            <DIR>  08-12-2018  2:01p
NLS             <DIR>  08-12-2018  2:01p
PACKAGES        <DIR>  08-12-2018  2:01p
TEMP            <DIR>  08-12-2018  2:07p
BOOT    BSS          512  08-12-2018  2:08p
BOOT    MBR          512  08-12-2018  2:08p
VERSION  FDI          31  08-12-2018  2:08p
              3 file(s)         1,055 bytes
              10 dir(s)       284,073,984 bytes free
C:\>

```

Changing the working directory

Once you can see the contents of a directory, you can move into any other directory. On DOS, you change your working directory with the `CHDIR` command, also abbreviated as `CD`. You can change into a subdirectory with a command like `CD CHOICE` or into a new path with `CD \FDOS\DOC\CHOICE`.

```
C:\FDOS\DOC>cd choice
C:\FDOS\DOC\CHOICE>dir
Volume in drive C is FREEDOS2016
Volume Serial Number is 1716-15E3

Directory of C:\FDOS\DOC\CHOICE

.                <DIR>  08-12-2018  2:01p
..               <DIR>  08-12-2018  2:01p
BUGS             186   07-15-2003  3:24p
INSTALL         394   04-17-2002 12:39a
NEWS            2,826 07-15-2003  3:29p
README          426   04-17-2002 12:38a
                4 file(s)          3,832 bytes
                2 dir(s)       284,073,984 bytes free
C:\FDOS\DOC\CHOICE>
```

Just like on the Linux command line, DOS uses `.` to represent the current directory, and `..` for the parent directory (one level “up” from the current directory). You can combine these. For example, `CD ..` changes to the parent directory, and `CD ..\..` moves you two levels “up” from the current directory.

FreeDOS also borrows a feature from Linux: You can type `CD -` to jump back to your previous working directory. This is handy after you change into a new path to do one thing and want to go back to your previous work.

```

C:\FDOS\DOC\CHOICE>cd \
C:\>cd -
C:\FDOS\DOC\CHOICE>cd ..
C:\FDOS\DOC>cd ..\..\
C:\>dir
Volume in drive C is FREEDOS2016
Volume Serial Number is 1716-15E3

Directory of C:\

FDOS                <DIR>    08-12-2018   2:01p
AUTOEXEC  BAT         1,319    08-12-2018   2:08p
COMMAND  COM         66,945   08-28-2006  10:38p
FDCONFIG  SYS           762     08-12-2018   2:08p
KERNEL   SYS         46,685   05-11-2016   9:42p
          4 file(s)         115,711 bytes
          1 dir(s)        284,073,984 bytes free
C:\>

```

Changing the working drive

Under Linux, the concept of a drive is hidden. In Linux and other Unix systems, you “mount” a drive to a directory path, such as **/backup**, or the system does it for you automatically, such as **/var/run/media/user/flashdrive**. But DOS is a much simpler system. With DOS, you must change the working drive by yourself.

Remember that DOS assigns the first partition on the first hard drive as the **C:** drive, and so on for other drive letters. On modern systems, people rarely divide a hard drive with multiple DOS partitions; they simply use the whole disk, or as much of it as they can assign to DOS. Today, **C:** is usually the first hard drive, and **D:** is usually another hard drive or the CD-ROM drive. Other network drives can be mapped to other letters, such as **E:** or **Z:** or however you want to organize them.

Changing drives is easy under DOS. Just type the drive letter followed by a colon (**:**) on the command line, and DOS will change to that working drive. For example, on my system, my **D:** drive contains install programs for various DOS applications and games I want to test.

```

C:\>D:
D:\>dir /w
Volume in drive D is QEMU VVFAT
Volume Serial Number is F4BE-1AFD

Directory of D:\

[DUKE3D]      [FDITEMP. $$$]  [GCC-IA16]      [INFOZIP]      [TIECD]
[VISICALC]    1KEEN.ZIP       3DDUKE13.ZIP    4KEEN.ZIP      ASA.TXT
ASA57.EXE     ASA57_~1.EXE    ASEASY~1.TXT    BANANOID.ZIP   BLOOD.EXE
D2DEMO10.ZIP  DES_U31N.ZIP    DFORCES1.ZIP    DOOM19S.ZIP    DOSJUEGO.ZIP
DUKE3D.ZIP    EPICPN21.ZIP    FROGPANT.REF    HTIC_U12.ZIP   JILL.ZIP
POS71J.EXE    QUAKE106.ZIP    RADIX.ZIP       RAPTOR.ZIP     ROTTSW13.ZIP
ROW4.ZIP      TIE.CD          TOMBDEMO.ZIP    TYRIAN.ZIP     28 file(s)
 94,998,783 bytes
   6 dir(s)      269,516,800 bytes free
D:\>_

```

Other things to try

With the CD and DIR commands, you have the basics of DOS navigation. These commands allow you to find your way around DOS directories and see what other subdirectories and files exist. Once you are comfortable with basic navigation, you might also try these other basic DOS commands:

- **MKDIR** or **MD** to create new directories
- **RMDIR** or **RD** to remove directories
- **TREE** to view a list of directories and subdirectories in a tree-like format
- **TYPE** and **MORE** to display file contents
- **RENAME** or **REN** to rename files
- **DEL** or **ERASE** to delete files
- **CLS** to clear the screen

- `EDIT` to edit files

If those aren't enough, you can find a list of common DOS commands in the cheat sheet at the end of this e-book.

In FreeDOS, you can use the `/?` parameter to get brief instructions to use each command. For example, `EDIT /?` will show you the usage and options for the editor. Or you can type `HELP` to use an interactive FreeDOS help system.

Like any DOS, FreeDOS is meant to be a simple operating system. The DOS filesystem is pretty easy to navigate with only a few basic commands. So feel free to experiment with the FreeDOS command line. Maybe now it won't seem so scary.

2. Running Applications

As-Easy-As

In the early 1990s, I was an undergraduate physics student at the University of Wisconsin-River Falls. A major component of our program was the physics lab. Every semester of the two-year general physics track included a lab. Later in the program, physics students participated in Physics Lab 301 and 302, also known as Junior Lab because most of us took them in our junior year. Depending on your program focus, you might also take other physics labs.

As you can imagine, a large part of my physics degree involved time in a lab. I constantly analyzed data, so it shouldn't be very surprising to learn that I depended on a quality spreadsheet program.

In the late 1980s and early 1990s, the most common spreadsheet program for MS-DOS was Lotus 1-2-3. I remember my dad installed a copy of Lotus 1-2-3 on our home computer, but that was really the take home license from his office. Lotus 1-2-3 was excellent software, but it was far too expensive for me at the time. I soon discovered the As-Easy-As spreadsheet, a shareware program that provided basically the same functionality and features of Lotus 1-2-3, but at a fraction of the cost.

Shareware was still something of a new idea in the early 1990s. The basic idea was that you could install the software and try it out. If you liked it, you registered the program by sending the author a check. Most shareware registration fees were pretty low, usually \$20 to \$30, depending on the program. The shareware model encouraged you to share the program with friends, such as by passing around the install program on a floppy disk, hence the name "shareware."

Enter As-Easy-As

I don't know how many times I used As-Easy-As to help analyze my lab data, but it was a lot. I especially appreciated the linear regression function, which fit the best line to a linear data set, including standard deviations of the slope and intercept. These error analysis values were a required element of our physics labs, and while I could run linear data analysis via a FORTRAN program on our campus VAX system, it was not always convenient. Using As-Easy-As on my home computer, I could run the analysis without leaving my dorm or apartment, and without having to dial into the often-busy modem pool.

As-Easy-As was my favorite DOS program of the era, no question, and I still have a great fondness for As-Easy-As, many years later. Whenever I install FreeDOS somewhere, I usually install As-Easy-As, as well.

If you're new to FreeDOS and wonder, "What can I do with FreeDOS?" then I encourage you to try As-Easy-As. While the original version of As-Easy-As was shareware, TRIUS Software has since posted the original install files and activation code for As-Easy-As 5.7, including the full user manual, for free (this isn't free software or even open source software, but a closed source program that is now available at no cost.). Thanks, TRIUS!

Installation is simple; just unzip the package and run the installer. When you've done that, find your way to the As-Easy-As directory (by default, that's **C:\ASEASY**), and type **ASEASY.EXE**.



The screenshot shows a DOS window with a blue background. The title bar at the top reads "A1:". Below the title bar is a menu bar with options: [A]ABCDEFGH. The main area of the window is a grid with a vertical column of numbers from 1 to 20 on the left side. The bottom of the window features a status bar with the following text: (1) ← → F1: ? F2: Edit F3: Macro F4: Abs F5: Goto F6: Wind F7: Uiew F9: Calc F10: Graph U57 Free: 100% [257k] AutoN READY! 2:53:18 pm

Data and calculations

If you are familiar with modern spreadsheet programs like LibreOffice Calc or Microsoft Excel, you will notice a few differences in As-Easy-As. That's because As-Easy-As tried to be as much like Lotus 1-2-3 as possible. Microsoft, and later LibreOffice, tried to simplify the spreadsheet and introduced some new standards. You'll notice this in how you enter data into the spreadsheet.

There are three basic ways to enter data:

Number data

Spreadsheets were built for numbers. That's their specialty. So As-Easy-As (as most other spreadsheets) make it really easy to enter numbers. Just type a number.

String data

In Excel and other modern spreadsheets, you can just type in a string, like the label for a column. As long as the string doesn't look like a number, then Excel saves that data as a string. As-Easy-As sort of works the same way. If you enter an `x` in a spreadsheet cell, As-Easy-As saves that as an "x" string. But it's safer to enter strings by starting them with a single quote. So instead of typing `x`, you type `'x`.

Calculations

This is really where things are different under As-Easy-As versus modern spreadsheets. In Excel or other spreadsheets, you start a calculation with the `=` sign. So to enter a calculation like "cell **A1** plus one" in Excel, you type `=A1+1`. In As-Easy-As, you start calculations with a `+` sign. So to enter the same calculation in As-Easy-As, you type `+A1+1`.

Or as you'll see below, you can also start a calculation with `@`.

Functions

The power of spreadsheets is in their functions. Functions make calculations really easy. Every spreadsheet has the same basic functions: calculate the sum of a list of numbers, averages, and so on. Some of these functions are named differently As-Easy-As than modern spreadsheets. For

example, the function to calculate an average of a list of numbers is `AVERAGE` on Excel, and `AVG` on As-Easy-As.

Functions in As-Easy-As are set off with an `@` character. So the summation function is actually entered as `@SUM` and the average function as `@AVG`.

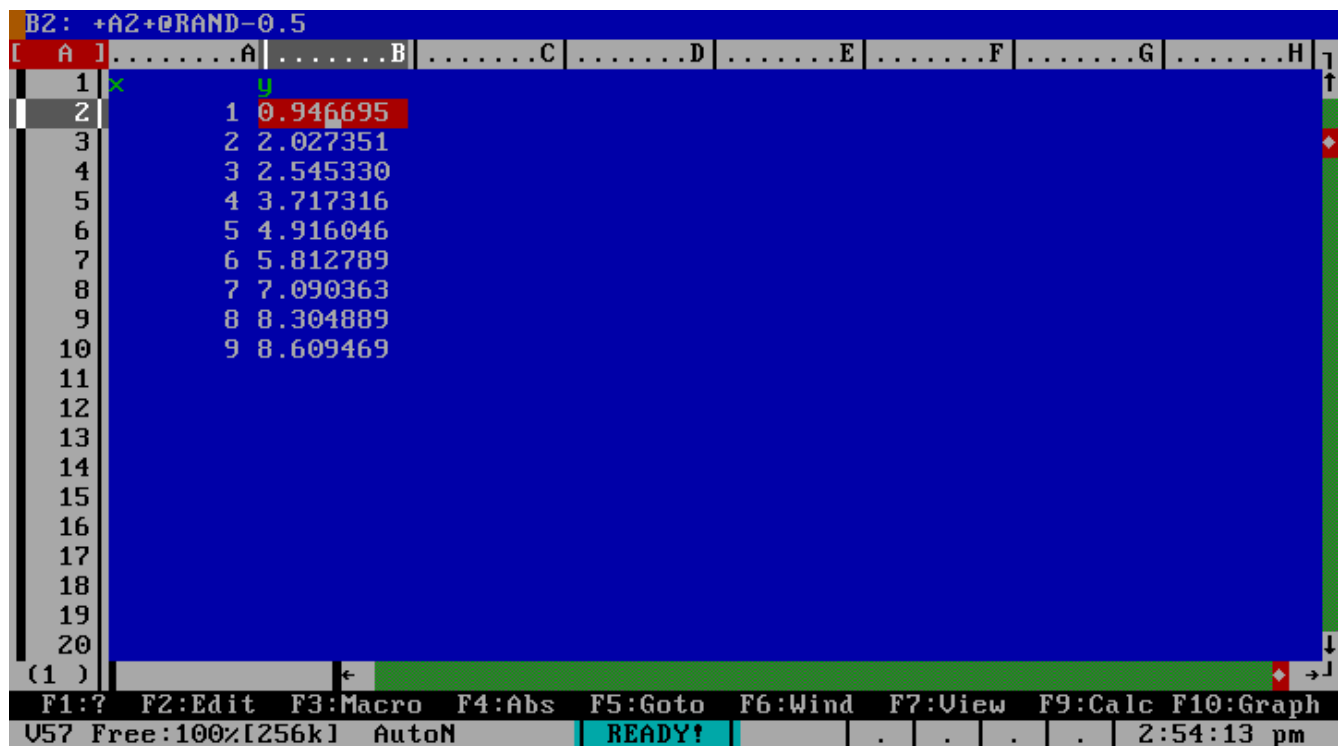
In As-Easy-As, you can get a list of all the spreadsheet functions, and how to use them, in the online help. Just press the `F1` key and see the list of available functions.

Example: Plotting a line

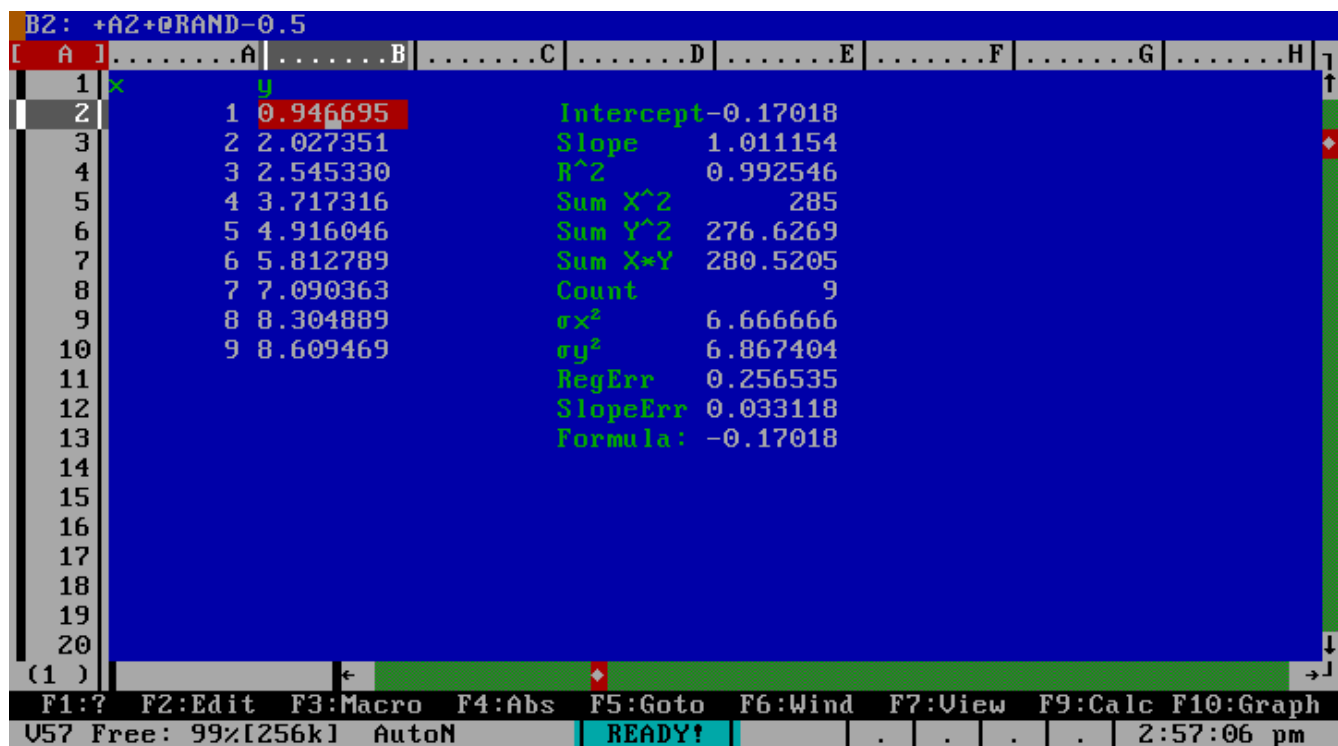
Let's walk through a simple example.

As an undergraduate physics student, I often used As-Easy-As to perform linear regression. As a quick example, I created a simple table of x,y data that described a line ($y=x$). Because a line that is exactly $y=x$ isn't very interesting, I added some randomness to it using the random number function (`@RAND`). The random number function generates a random value between zero and one, and I chose to center the randomness around the $y=x$ line. So for each x , the corresponding y value was $x + @RAND - 0.5$.

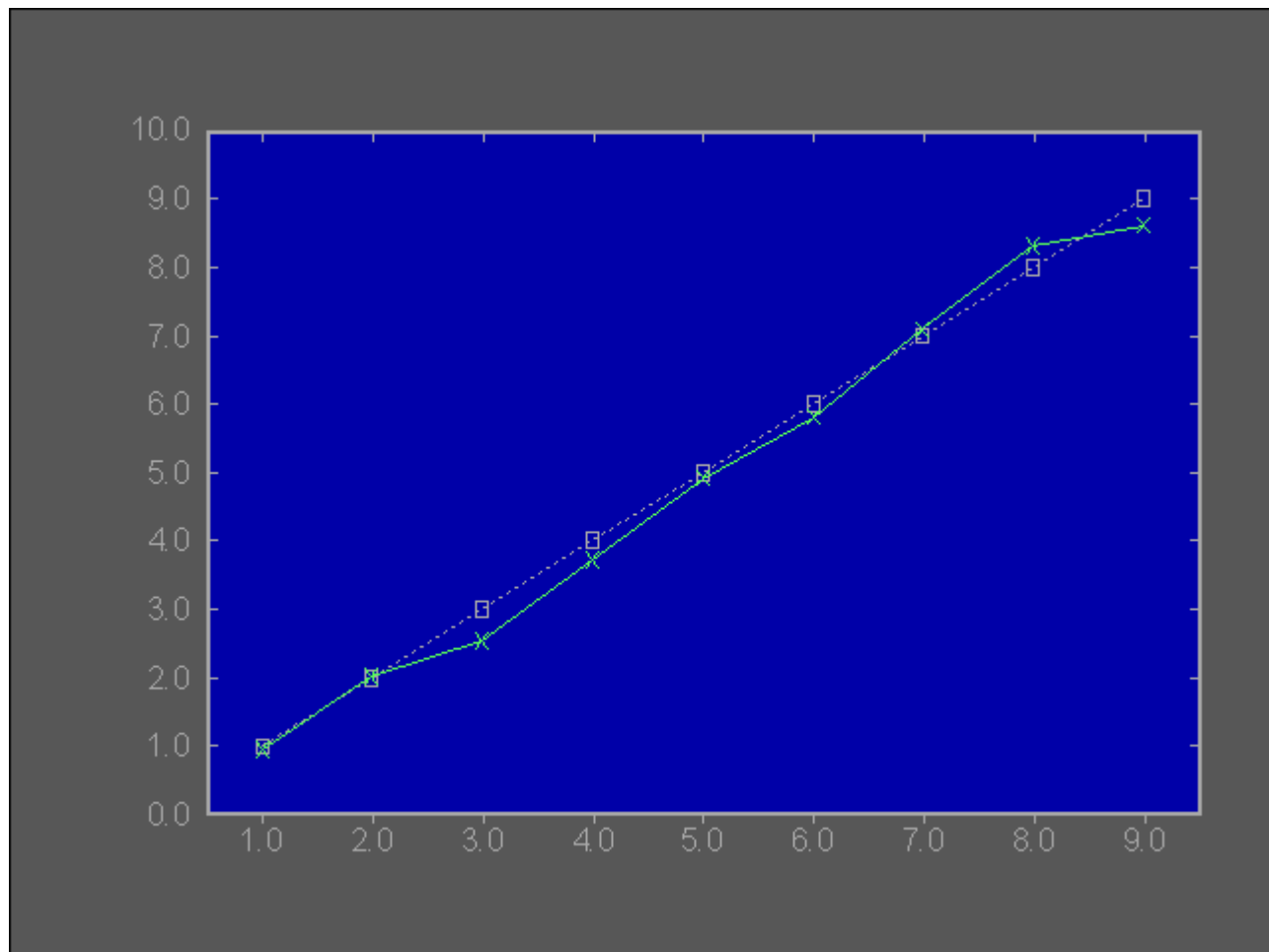
In the spreadsheet, you can reference another cell using a cell reference. So the value **A2** references whatever value is stored in column A, row 2. Once you enter the calculation `+A2+@RAND-0.5` into the **B2** cell, you can copy the cell to other cells in the same column, and As-Easy-As will propagate the cell references. Similar to autofill in LibreOffice Calc and Microsoft Excel, the **B3** cell bases its calculations from the **A3** cell, and so on.



I mentioned that As-Easy-As includes a useful linear regression analysis. You tell As-Easy-As where to find the data, and where to prints its results. As you can see below, As-Easy-As fit a straight line of slope 1.011 ± 0.033 and intercept -0.17 ± 0.25 to my randomized linear data.



And the chart from this data:



Example: Projecting a trend

Here's another simple example:

What if you wanted to project a trend of current data? I track how many times people download the FreeDOS 1.2 distribution from our website. It's pretty constant, so I entered the download counts for the month of July 2018 into As-Easy-As, and generated a simple trend starting from the middle of the month.

Since downloads are pretty constant, I made the simple assumption to use the average function on the previous data. That is, the next day's downloads should be pretty close to the average of the days before it. In As-Easy-As, I needed to enter the `@AVG` function to reference a range of cells.

Referencing a range in LibreOffice Calc, Microsoft Excel or other modern spreadsheets uses the `:` separator, so to reference the five values in column A, rows 2 to 6, you would enter `A2:A6`. In As-Easy-As, you use the `..` separator. You reference the same range using `A2..A6`.

That's all that's required to generate a simple trend of our download data in July. Since I already had the complete data, I also generated a simple calculation of the difference of the trend prediction versus the actual value.

C12: @AUG(B2..B11)

	A	B	C	D	E	F	G	H
1	February Count							
2	1	1455						
3	2	1435						
4	3	1491						
5	4	1652						
6	5	1657						
7	6	1973						
8	7	1933						
9	8	1453						
10	9	1615						
11	10	1700						
12	11	1539	1636.4					
13	12	1584	1644.8					
14	13	1581	1659.7					
15	14	1295	1668.7					
16	15	1431	1633					
17	16	1557	1610.4					
18	17	1799	1568.8					
19	18	1871	1555.4					
20	19	1732	1597.2					

(1)

F1:? F2:Edit F3:Macro F4:Abs F5:Goto F6:Wind F7:Uiew F9:Calc F10:Graph
 U57 Free: 99%[255k] AutoN B10 READY! . Num . . 3:07:08 pm

The screenshot shows a spreadsheet window titled 'D12: +C12-B12'. The spreadsheet has columns labeled A through H and rows numbered 1 through 20. The data is as follows:

Row	February Count	Estimate	Diff
1	1	1455	
2	2	1435	
3	3	1491	
4	4	1652	
5	5	1657	
6	6	1973	
7	7	1933	
8	8	1453	
9	9	1615	
10	10	1700	
11	11	1539	1636.4
12	12	1584	1644.8
13	13	1581	1659.7
14	14	1295	1668.7
15	15	1431	1633
16	16	1557	1610.4
17	17	1799	1568.8
18	18	1871	1555.4
19	19	1732	1597.2
20			

The status bar at the bottom shows: F1:?, F2:Edit, F3:Macro, F4:Abs, F5:Goto, F6:Wind, F7:View, F9:Calc, F10:Graph, U57 Free: 99%[255k], AutoN B10, READY!, Num, ., ., 3:08:15 pm.

As-Easy-As is a powerful spreadsheet program that supports more capabilities than I've shown here. As you explore As-Easy-As, remember that the power of any spreadsheet program is in manipulating numbers. If you can track something using numbers, you can leverage the flexibility of a spreadsheet. And As-Easy-As makes managing a spreadsheet as easy as 1, 2, 3.

Quattro Pro

In the 1990s, my spreadsheet of choice was first the venerable Lotus 1-2-3, then the shareware As-Easy-As. As an undergraduate physics student at university, I was always analyzing data from some lab, and I lived by my spreadsheet.

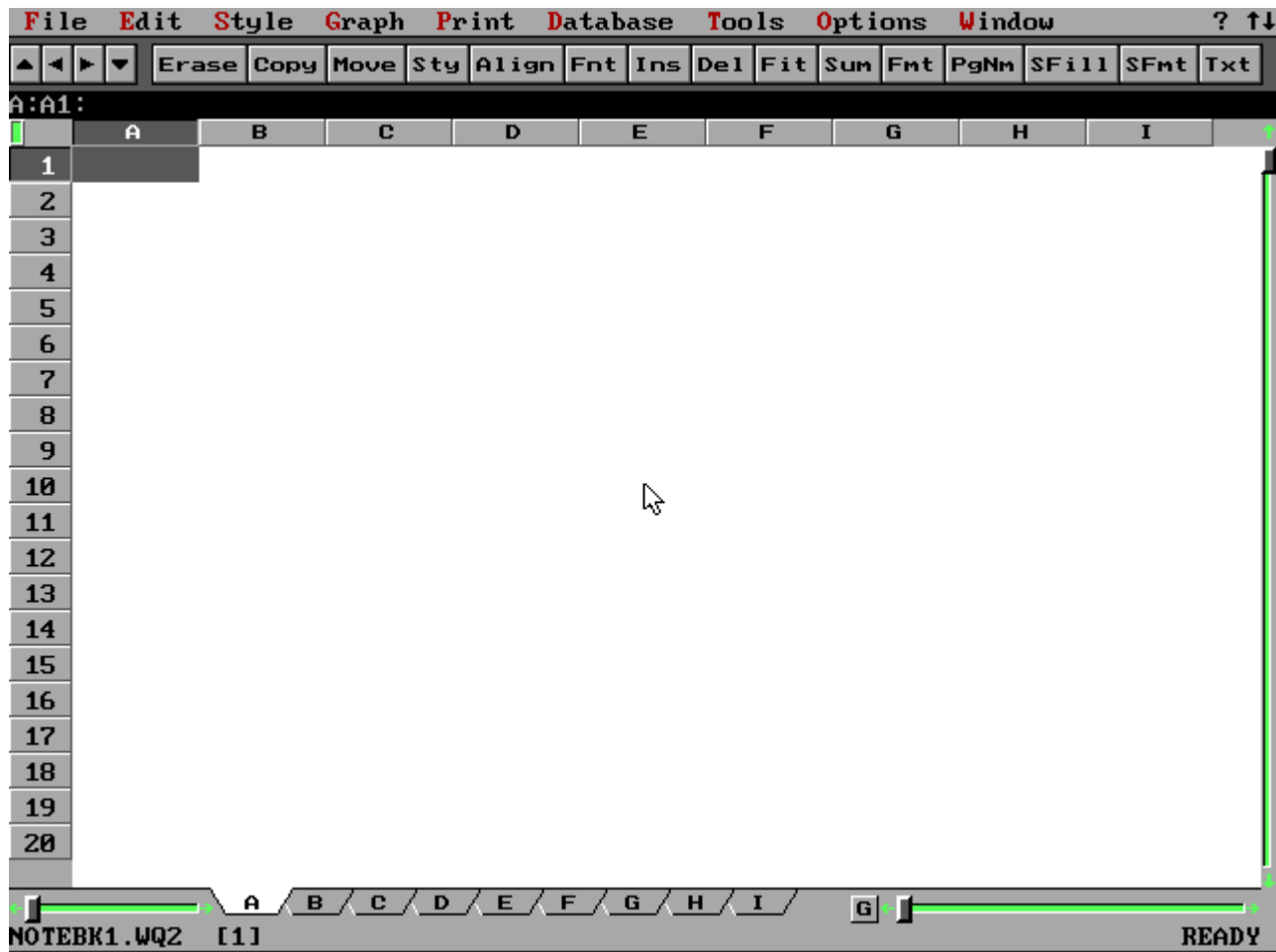
Aside from Lotus 1-2-3 and As-Easy-As, I also experimented with other spreadsheet programs. I loved numbers, and spreadsheets made it easy to enter, manipulate, and display data. So when a new spreadsheet program came along, I tried it out.

Borland's Quattro Pro

Quattro Pro was the first DOS program I encountered that used a WYSIWYG (what you see is what you get) interface. Even though Quattro Pro was a DOS application, the program actually ran in graphics mode. This allowed the application to render numbers and text using fonts, lending a modern feel to the spreadsheet. The DOS version of Quattro Pro looks similar to today's spreadsheets with the sans-serif, proportionally-spaced, black-on-white text, and clickable row and column headers rendered as buttons.

The graphics mode also allowed Quattro Pro to fit more text on the screen without it feeling crowded. In other DOS spreadsheets, you really only have room for about 20 rows on screen. That's because a DOS text console runs at 80 columns and 25 lines (standard) and with a cell data line, column headers, horizontal scroll bar, status line, and help line, you've already taken five lines from the screen (leaving 20 for data). But Quattro Pro runs in graphical mode, so it can display text

at various sizes. Quattro Pro manages to squeeze in a menu bar, quick-reference action bar, cell data line, column headers, horizontal scroll bar, and status line, and still have room for 20 spreadsheet rows.

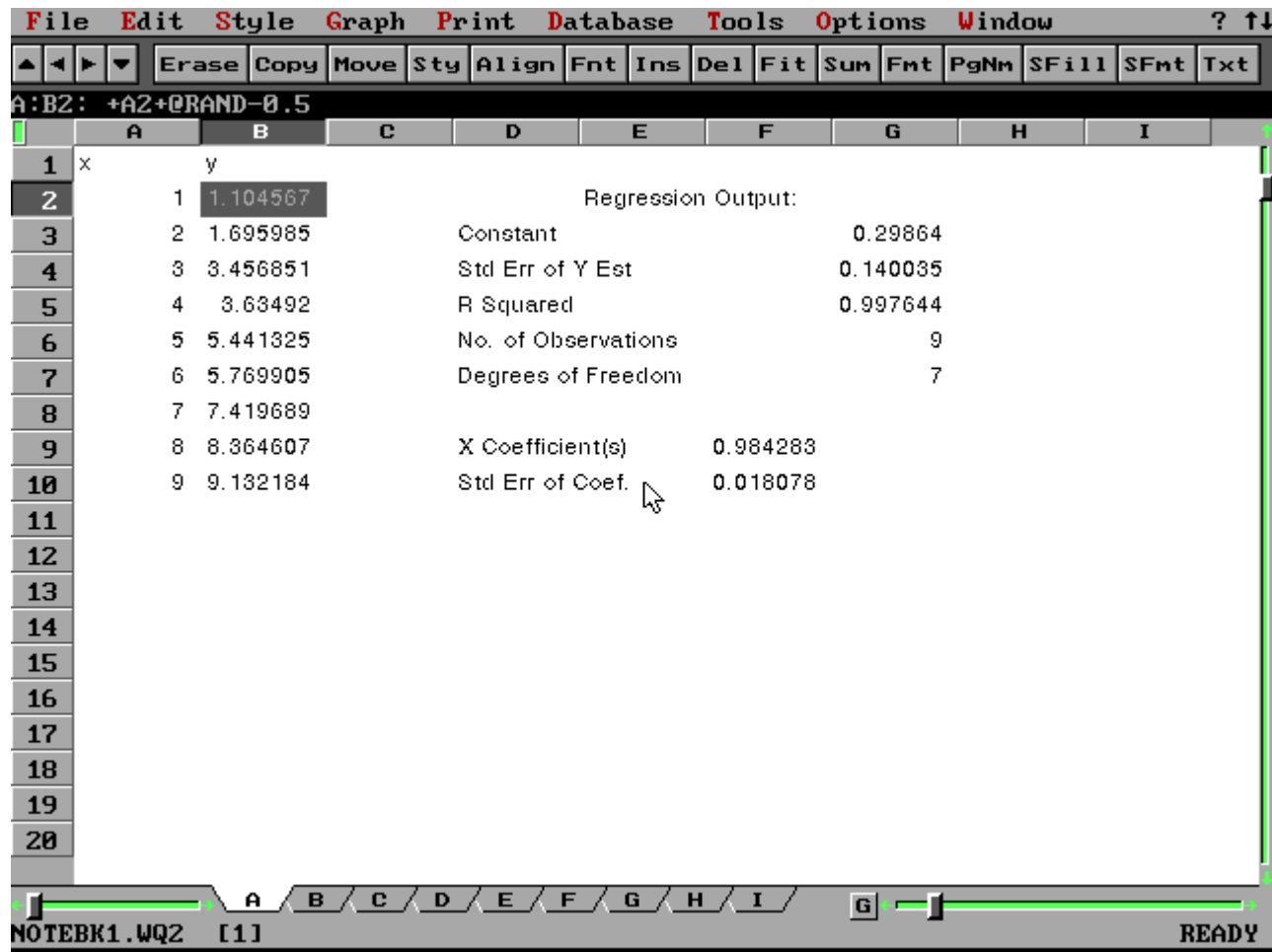


Like other spreadsheets at the time, Quattro Pro used the same data entry rules as Lotus 1-2-3, using `..` to specify ranges of data (modern spreadsheets use `:`), `+` to start calculations and `@` to reference functions (today's spreadsheets use `=`), and other rules.

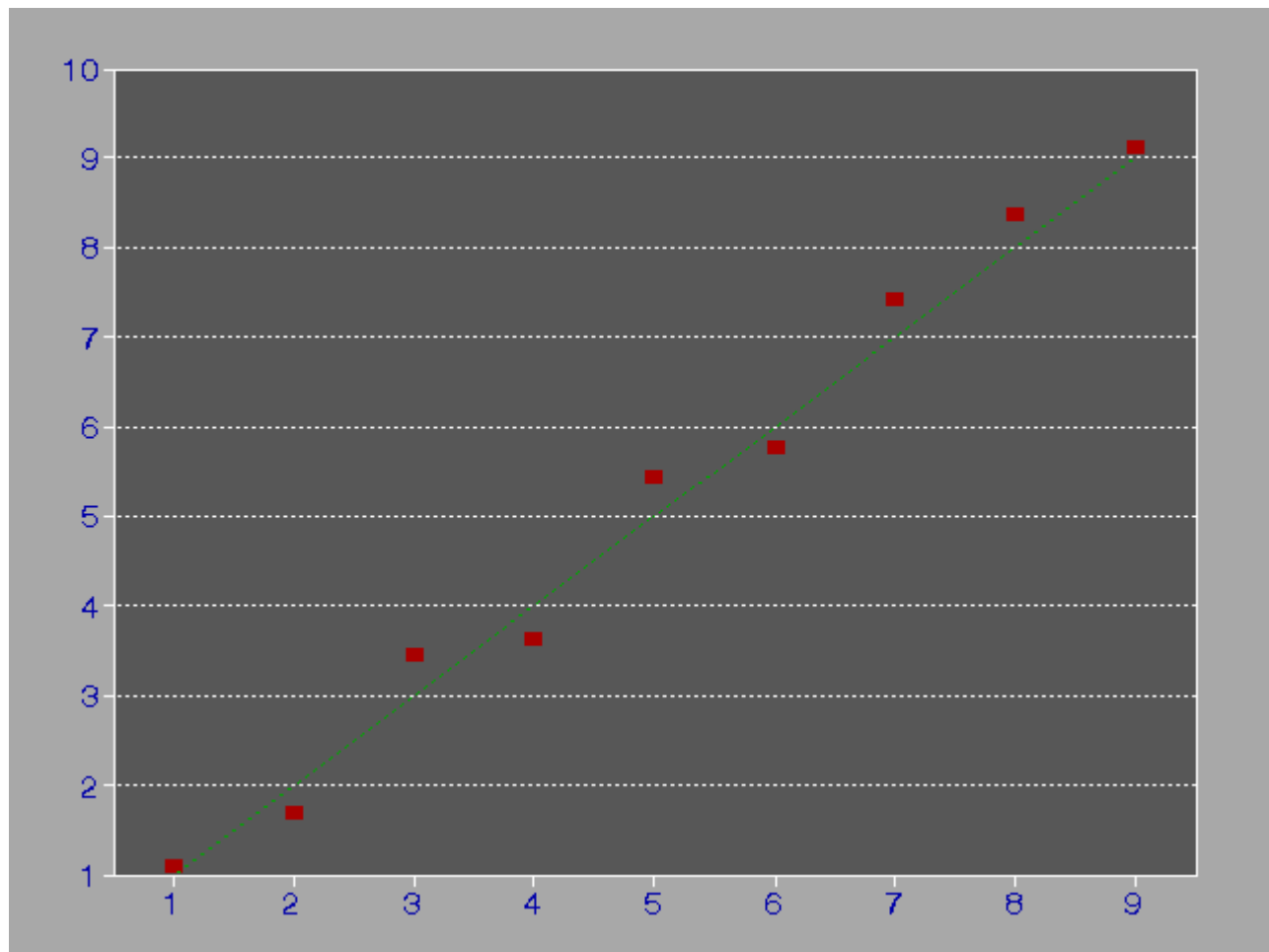
Example: Plotting a line

A common function needed by many professionals (and physics students like me) was the ability to fit a line to x,y data. To test this feature, I generated a simple line $y=x$. Because a straight line isn't very interesting, I added some randomness to the data using the random number function. This generates a random value between 0 and 1, so I centered the randomness using the cell function `+x+@RAND-0.5`.

As you can see, Quattro Pro fit a straight line of slope 0.98 ± 0.02 , and intercept 0.29 ± 0.14 . That's the $y=x$ line that you'd expect.



Charting the data is just as easy. I added the straight line by defining a second y series that was the same as the x series. You can adjust line types in Quattro Pro, like other spreadsheets, so I adjusted the chart series to show data as red dots and the line as dotted green without points.



An advantage to running the spreadsheet in graphics mode all the time, is generating a chart seems to run faster. The program doesn't need to flip the display into graphics mode; it just erases the display and draws a chart.

Quattro Pro has the feel of a modern spreadsheet, mostly due to running in a graphical WYSIWYG mode. This was just one way that Quattro Pro was ahead of its time. How interesting to run a DOS spreadsheet program from the late 1980s and have it feel like a modern computer system.

VisiCalc

While Lotus 1-2-3 was an important spreadsheet program for DOS, and arguably the “killer app” for MS-DOS, it was not the first spreadsheet for personal computers. That honor belongs to VisiCalc.

Dan Bricklin first developed VisiCalc for the Apple II home computer, and later ported to MS-DOS. As the first spreadsheet, it had few of the features found in modern spreadsheet programs. Basically, VisiCalc presented a grid with letters for columns and numbers for rows, and allowed you to enter data in each cell.

```
A1
(C) 1979,1981 Software Arts, Inc.    UC-176Y2-IBM-TEST    C
#00000000    36
  A          B          C          D          E          F          G          H
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
```

Example: Adding a list of numbers

For a simple demonstration, I entered a list of numbers, and used the summation function (`@SUM`) to automatically calculate the list's total value.

	A	B	C	D	E	F	G	H
1		1	0					
2		2	1					
3		3	1					
4		4	2					
5		5	3					
6		6	5					
7		7	8					
8		8	13					
9		9	21					
10								
11	45	54						
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								

Performing these calculations so effortlessly on sets of data immediately made VisiCalc the must-have application for businesses. With a computer-based spreadsheet, workers could perform dependent calculations much more quickly than the same calculations by hand on a paper spreadsheet.

Note the use of `...` to specify a range, such as `A1...A10`. This differed in later DOS spreadsheets, which used `..` to indicate a range, and modern spreadsheets that use `:`.

Like other DOS spreadsheets it preceded, VisiCalc used `/` to access the program's menu. The spreadsheet's commands were represented by single letters, such as **B** to blank the values from a cell, or **M** to move a row or column. While this may seem unfriendly at first, frequent users found they learned the keystrokes very quickly.

To exit the program, tap the `/` key, then **S** to bring up the storage menu.

B11 (U) @SUM(B1...B9)		C
Storage: L S D Q #		86
A	B	C
1	1	0
2	2	1
3	3	1
4	4	2
5	5	3
6	6	5
7	7	8
8	8	13
9	9	21
10		
11	45	54
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

Select the **Q** (quit) action, and type **Y** to confirm.

B11 (U) @SUM(B1...B9)		C
Quit: Type Y to confirm		86
A	B	C
1	1	0
2	2	1
3	3	1
4	4	2
5	5	3
6	6	5
7	7	8
8	8	13
9	9	21
10		
11	45	54
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

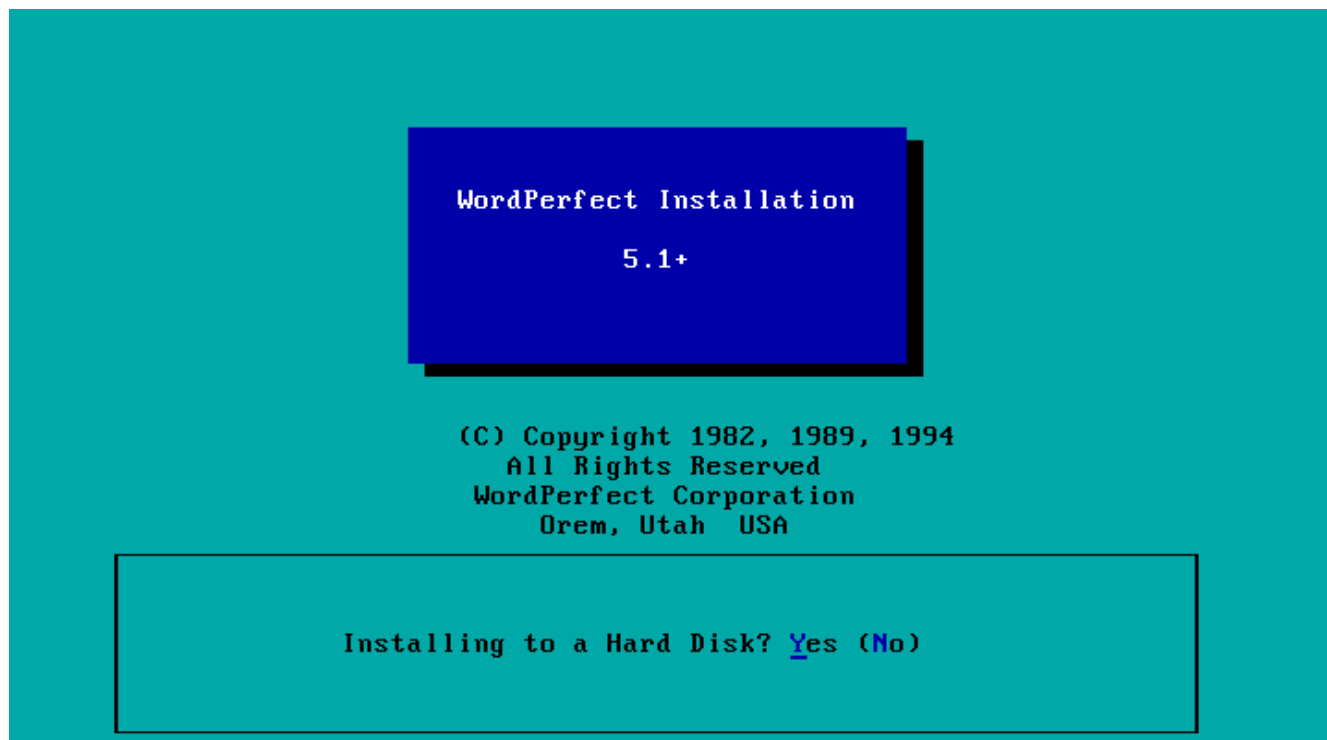
VisiCalc provides an effective spreadsheet that does the basics of managing and manipulating numbers, but don't expect much more than that. If all you need is the capability to track lists of numbers and perform calculations against them, VisiCalc will do the job quite well. You can

download a free version of VisiCalc from Dan Bricklin's VisiCalc website (www.bricklin.com) and access other free resources including a cheat sheet.

WordPerfect

In the 1980s, my preferred word processor was WordPerfect. It was a great word processing system. WordPerfect was fast, powerful, and streamlined. I liked that WordPerfect “got out of the way” so it only displayed my text, plus a small status bar at the bottom of the screen.

I used WordPerfect throughout the 1980s, but moved on to a different DOS word processor soon after 1990.



WordPerfect could be very challenging to use. It uses the function keys to access different features, like turning bold text on or off, or centering a block of text, or saving your work. Each function key **F1** to **F12** could be modified using **Alt**, **Ctrl**, or **Shift**, with a possible set of 48 different key combinations. In practice, not all of the function combinations were used.

In my test, I wrote a simple document that demonstrated centered text and simple formatting.

```
                Welcome to FreeDOS_

FreeDOS is a complete, free DOS-compatible operating system that
you can use to play classic DOS games, run legacy business
software, or develop embedded systems. Any program that works on
MS-DOS should also run on FreeDOS.

It doesn't cost anything to download and use FreeDOS. You can also
share FreeDOS for others to enjoy! And you can view and edit our
source code, because all FreeDOS programs are distributed under the
GNU General Public License or a similar open source software
license.

Doc 1 Pg 1 Ln 1" Pos 5.15"
```

A powerful feature of WordPerfect was Reveal Codes, which allowed you to see how the word processor translated your document. Have you ever messed up a document in LibreOffice or Microsoft Word, adding some random formatting, and you wish you could go in and remove the one weird formatting code? With Reveal Codes, you could do that.

```

Welcome to FreeDOS_

FreeDOS is a complete, free DOS-compatible operating system that
you can use to play classic DOS games, run legacy business
software, or develop embedded systems. Any program that works on
MS-DOS should also run on FreeDOS.

It doesn't cost anything to download and use FreeDOS. You can also
share FreeDOS for others to enjoy! And you can view and edit our
source code, because all FreeDOS programs are distributed under the
GNU General Public License or a similar open source software
Doc 1 Pg 1 Ln 1" Pos 5.15"
{ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ }
[Center][BOLD>Welcome to FreeDOS[bold][HRt]
[HRt]
FreeDOS is a complete, free DOS[-]compatible operating system that[SRt]
you can use to play classic DOS games, run legacy business[SRt]
software, or develop embedded systems. Any program that works on[SRt]
MS[-]DOS should also run on FreeDOS.[HRt]
[HRt]
It doesn't cost anything to download and use FreeDOS. You can also[SRt]
share FreeDOS for others to enjoy! And you can view and edit our[SRt]
source code, because all FreeDOS programs are distributed under the[SRt]

Press Reveal Codes to restore screen

```

As an experiment, I loaded my test file into LibreOffice, and it imported correctly. Granted, this wasn't a very complex document, but it was interesting to see that LibreOffice could read WordPerfect files.

If you're interested in learning about the history of WordPerfect, you may also want to read [Almost Perfect](#) by Pete Peterson.

WordStar

You may have heard that Game of Thrones author George R.R. Martin uses WordStar 4.0 to write his books. I thought it would be interesting to go back and look at this classic word processor on FreeDOS.

Maybe you've heard of WordStar but haven't used it, and that wouldn't be a surprise. WordStar is a very old program. Originally written for CP/M 8-bit computer systems in the late 1970s, WordStar was later ported to MS-DOS systems in the early 1980s. WordStar was one of the first programs for DOS.

At the time, WordStar was noted for being a difficult program. While you might find it quite simple today, that doesn't mean WordStar will be easy for new users. If you haven't used it before, be prepared for a learning curve.

WordStar opens with a menu where users can open a document, print a file, or do other file operations.

```

WordStar Professional Release 4
----- O P E N I N G   M E N U -----
D open a document          L change logged drive/directory
N open a nondocument      C protect a file
P print a file             E rename a file
M merge print a file       O copy a file
I index a document        Y delete a file
T table of contents       F turn directory off
X exit WordStar           Esc shorthand
J help                    R run a DOS command

DIRECTORY   Drive C:\WS   259M free
\ .
.1k CHAPTER2.DOC   .1k CHAPTER3.DOC   .4k BOX           .1k CHAPTER1.DOC
3.1k LASER2.DOC    80k PATCH.LST      3.5k DIARY.DOC    8.3k LASER1.DOC
.9k RULER.DOC     .6k SAMPLE1.DOC    5.5k PRINT.TST    94k README.TXT
.9k TABLE.DOC    5.5k TEXT.DOC      .4k SAMPLE2.DOC   .3k SAMPLE3.DOC
                  1.8k WS3KEYS.PAT   1.5k WSINDEX.XCL

```

WordStar includes several sample documents that demonstrate various features of the word processor, or provide an opportunity to experiment with the system. I opened an existing document (**TEXT.DOC**, containing an excerpt from Gulliver's Travels) as a simple demo of WordStar.

```

C:\TEXT.DOC          P01 L01 C01 Insert Align
----- E D I T   M E N U -----
CURSOR      SCROLL      ERASE      OTHER      MENUS
^E up       ^W up           ^G char    ^J help    ^O onscreen format
^X down     ^Z down        ^T word    ^I tab     ^K block & save
^S left     ^R up screen   ^Y line    ^V turn insert off ^P print controls
^D right    ^C down        Del char   ^B align paragraph ^Q quick functions
^A word left screen    ^U unerase ^N split the line Esc shorthand
^F word right

L---!---!---!---!---!---!---!---!---!---!---!-----R
          Gulliver's Travels
          Part I
          A Voyage to Lilliput
          Chap. I
My father had a small estate in Nottinghamshire; I was the third
of five sons. He sent me to Emanuel College in Cambridge at
fourteen years old, where I resided three years, and applied
myself close to my studies: but the charge of maintaining me
Display Center ChkRest ChkWord Del Blk HideBlk MoveBlk CopyBlk Beg Blk End Blk
1Help 2Undo 3Undrln4Bold 5DelLine6DelWord7Align 8Ruler 9Save & 0Done

```


The upper third of the screen is devoted to a quick-reference menu of WordStar's functions. As you become more familiar with WordStar, you can turn off display of this menu, giving you more screen area to display your document.

Unfortunately, WordStar is not open source software, so we cannot include it in future FreeDOS distributions, but it's interesting to try out this original DOS application.

Why Screenshots Look Weird

If you remember the early PC era, or if you are a hobbyist who uses original PC hardware, maybe you wonder why PC emulator screenshots don't quite look like screens running on real hardware.

Screenshots of PC emulators look “stretched” horizontally. That's because PC emulators represent pixels as individual squares, like modern computer displays. But the original CRT monitors didn't use square pixels. Instead, the pixels were in a matrix that effectively squeezed pixels together horizontally.

It's really noticeable in text-mode screenshots. For example, here's a screenshot of FreeDOS 1.2, taken in QEMU:

```

Modules using memory below 1 MB:

Name                Total                Conventional          Upper Memory
-----            -
SYSTEM              16,784 (16K)          10,480 (10K)          6,304 (6K)
COMMAND             4,064 (4K)            0 (0K)                4,064 (4K)
UDUD2               2,000 (2K)            0 (0K)                2,000 (2K)
FDAPM               928 (1K)              0 (0K)                928 (1K)
CTMOUSE            3,104 (3K)            0 (0K)                3,104 (3K)
SHSUCDX            11,008 (11K)          0 (0K)                11,008 (11K)
Free                722,144 (705K)       643,552 (628K)       78,592 (77K)

Drives Assigned
Drive Driver Unit
D:  FDCD0001  0
E:  FDCD0001  1
1 drive(s) available.

Done processing startup files C:\FDCONFIG.SYS and C:\AUTOEXEC.BAT

Type HELP to get support on commands and navigation.

Welcome to the FreeDOS 1.2 operating system (http://www.freedos.org)

C:\>

```

And my favorite DOS spreadsheet, As-Easy-As:

```

A1:
[ A ] .....A .....B .....C .....D .....E .....F .....G .....H
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
( 1 )
F1:? F2:Edit F3:Macro F4:Abs F5:Goto F6:Wind F7:View F9:Calc F10:Graph
U57 Free:100% [257k] AutoN READY! 2:53:18 pm

```

Technically, the PC uses an 8×16 character set, with an extra pixel of spacing to provide some spacing between letters. The result is an effective 9×16 character set. In text mode, QEMU

emulates this standard PC character set, at 9 pixels wide by 16 pixels high. So it's easy math to understand why this 80×25 display is 720×400 pixels in size.

If you're running FreeDOS on modern hardware, such as a laptop, using an LCD screen (most common today), then this screenshot should look normal to you. The problem is that original PC hardware didn't use an exactly square pixel. So when you compare this 720×400 screenshot to original hardware, the screenshot looks weird.

Pixels aren't always square

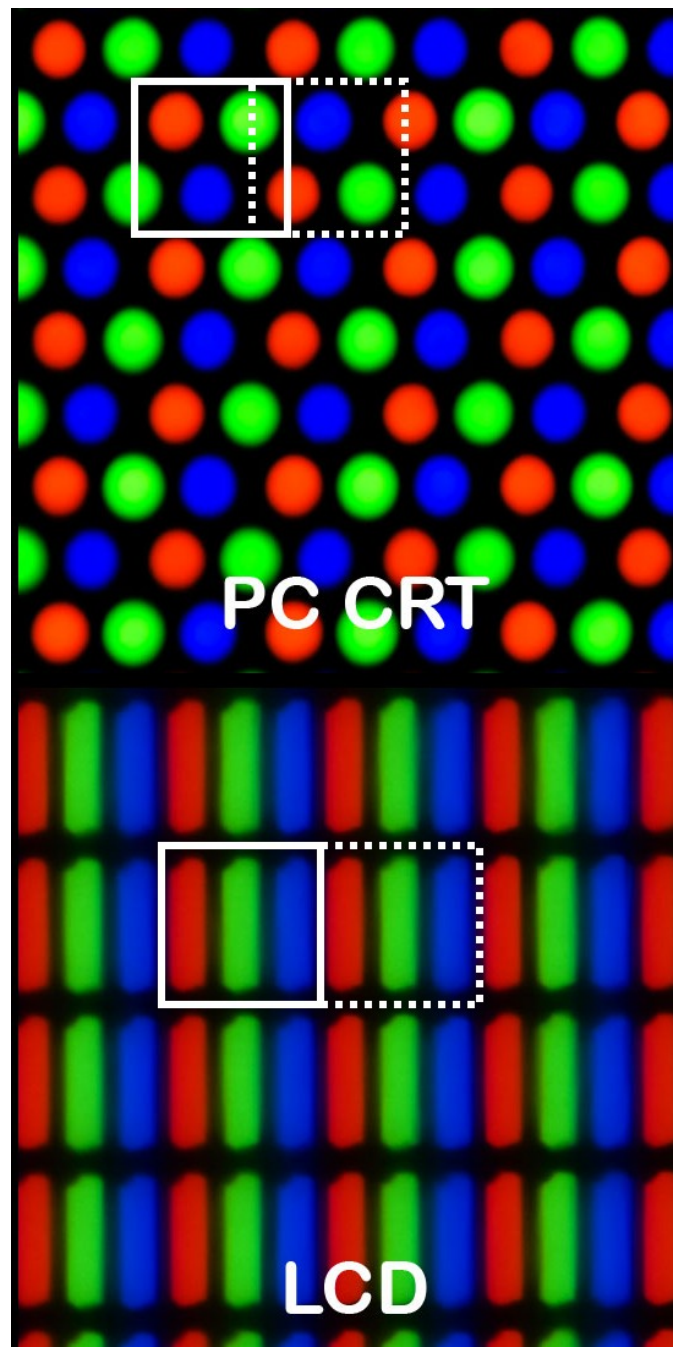
The pixel hasn't always been a square dot. In modern flat panel displays, such as LCD, the pixel is a roughly square arrangement of red, green, and blue rectangles. Light all of them at once, and the human eye perceives them as a white square.

Original PC hardware used the CRT (cathode ray tube). The CRT used a hexagonal arrangement of red, green, and blue dots. Because these were not rectilinear, each pixel overlapped with the one next to it.

In the image below, I've modified a photo showing the arrangement of RGB on both CRT (top) and LCD (bottom). I've also outlined two adjacent pixels, one with a solid white line, and the next with a dotted white outline. You can see the LCD pixels adjoin, where the CRT pixels overlap slightly.

The result is that text on CRT displays looks a little different than text on LCD displays. Not a lot different, but a little different.

Computer displays on the early IBM PC models used a 4:3 aspect ratio, and the character generator outputted 80×25 text that neatly filled the screen. In modern PC emulators, a pixel in text mode is represented as a single square dot. That means 80×25 text at 9×16 pixel dimensions fills a 720×400 screen, at an aspect ratio of 72:40, or about 5.4:3 aspect ratio. So the text appears too wide, compared to original PC hardware.



Peter Halasz's photo ([Pixel geometry 01 Pengo.jpg](#)) is available on Wikipedia under the Creative Commons Attribution-Share Alike 3.0 Unported license.

Use the original aspect ratio

If I take the original QEMU screenshots, and resize them to have the same height but narrower image width, I can put the 80×25 display into a 4:3 aspect ratio. These screenshots have been forced to 533×400 pixels, which is 80×25 in 4:3 aspect ratio.

```

Modules using memory below 1 MB:

Name          Total          Conventional      Upper Memory
-----
SYSTEM        16,784 (16K)      10,480 (10K)      6,304 (6K)
COMMAND        4,064 (4K)         0 (0K)           4,064 (4K)
UDVD2          2,000 (2K)         0 (0K)           2,000 (2K)
FDAPM           928 (1K)          0 (0K)           928 (1K)
CTMOUSE        3,104 (3K)         0 (0K)           3,104 (3K)
SHSUCDX       11,008 (11K)       0 (0K)           11,008 (11K)
Free           722,144 (705K)    643,552 (628K)   78,592 (77K)

Drives Assigned
Drive Driver Unit
D:  FDCD0001  0
E:  FDCD0001  1
1 drive(s) available.

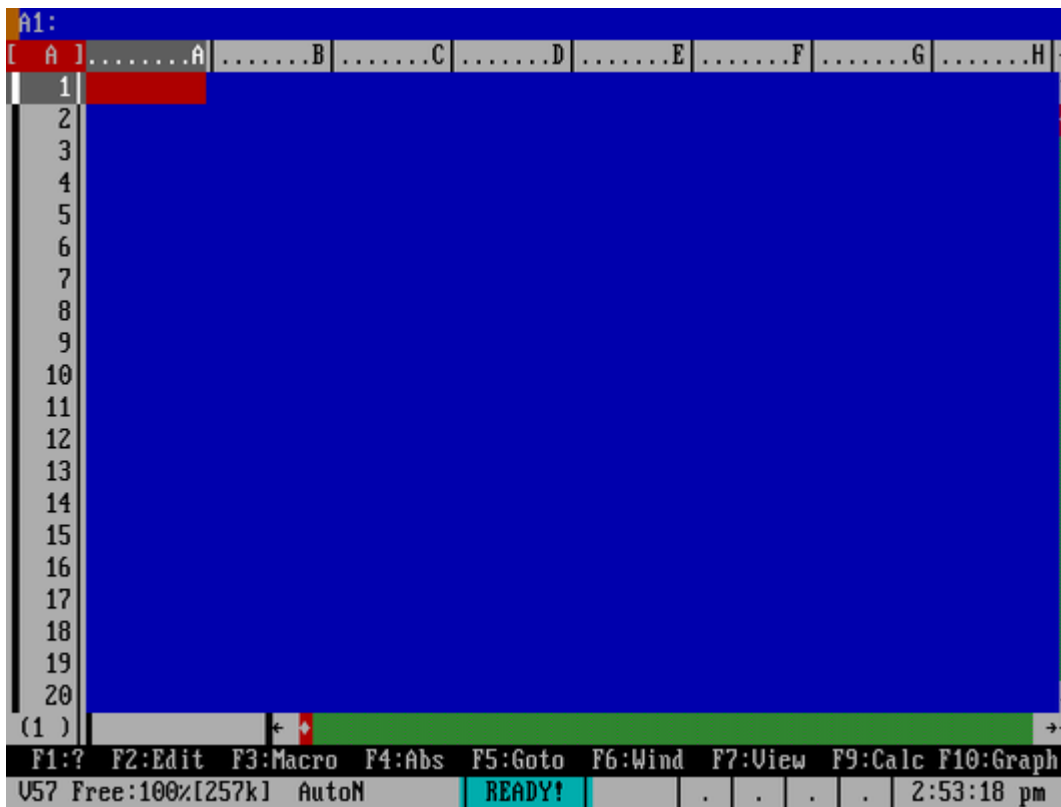
Done processing startup files C:\FDCONFIG.SYS and C:\AUTOEXEC.BAT

Type HELP to get support on commands and navigation.

Welcome to the FreeDOS 1.2 operating system (http://www.freedos.org)

C:\>

```



This looks more like how I remember using DOS in the 1980s and 1990s.

So if you've used FreeDOS on classic PC hardware, and wondered why the screen looks a little different than the screenshots we use on the FreeDOS website, that's why. Original hardware used a 4:3 display, but modern PC emulators use a one-for-one pixel display in text mode.

3. History

The Origin and Evolution of FreeDOS

I grew up in the 1970s and 1980s. My parents wanted to expose me and my brother to computers from an early age, so they bought an Apple II clone called the Franklin Ace 1000. I'm sure the first thing we used it for was playing games, but it didn't take long before we asked, "How does it work?" Our parents bought us a book about how to program in Applesoft BASIC, and we taught ourselves.

I remember my first programs were pretty standard stuff. Eventually I developed a fondness for creating simulations and turn-based games. For example, my friends and I played Dungeons and Dragons in our spare time, and I wrote several D&D-style games. A favorite hobby was re-creating the computer readouts from television shows and movies. Perhaps my largest effort was a program, based on the 1983 movie WarGames, that let you "play" global thermonuclear war.

Later, we replaced the Apple with an IBM PC. The BASIC environment on DOS was different from Applesoft BASIC, but I figured it out easily enough. I continued writing programs on it throughout my junior high and high school years.

In 1990, I became an undergraduate physics student continuing to write programs on the side. I learned the C programming language and picked up a C compiler. I wrote lots of utilities to help me analyze lab data or add new features to the MS-DOS command line. Like many others at the time, I also created utilities that replaced and enhanced the MS-DOS command line.

The university had a computer lab, giving me access to the VAX and Unix systems. I really liked Unix. The command line was similar to MS-DOS, but more powerful. I learned to use Unix when I was in the computer labs, but I still used MS-DOS on my personal computer. By running MS-DOS, I could use my favorite programs to write papers and help analyze lab data.

I discovered the concept of shareware programs, and I thought it was a pretty neat idea. I found MS-DOS shareware programs that filled my needs. I switched from WordPerfect to the shareware GalaxyWrite word processor to write papers. I used As-Easy-As to do spreadsheet analysis and Telix to dial into the university's computer lab when I needed to use a Unix system.

In 1993, I learned about a Unix system that I could run on my home computer for free. This Linux system seemed just as powerful as the university's Unix systems, but now I could run everything on my home computer. I installed Linux on my PC, dual-booted with MS-DOS. I thought Linux was neat and I used it a lot, but still spent most of my time in MS-DOS. Because let's face it, in 1993, there were a lot more applications and games on MS-DOS than on Linux.

How FreeDOS started

Because MS-DOS was my favorite operating system, I had built up this library of utilities I'd written to add new functionality to MS-DOS. I just thought DOS was a great operating system. I'd used Windows by this point, but if you remember the era, you know Windows 3.1 wasn't a great platform. I preferred doing my work at the command line, not with a mouse.

In early 1994, I started seeing a lot of interviews with Microsoft executives in tech magazines saying the next version of Windows would totally do away with MS-DOS. I looked at Windows 3.1 and said, "If Windows 3.2 or Windows 4.0 will be anything like Windows 3.1, I want nothing to do with it."

Having experience with Linux, I thought, "If developers can come together over the internet to write a complete Unix operating system, surely we can do the same thing with DOS." After all, DOS was a fairly straightforward operating system compared to Unix. DOS ran one task at a time (aka single-tasking) and had a simpler memory model. I'd already written a number of utilities that expanded the MS-DOS command line, so I had a head start.

I asked around the Usenet comp.os.msdos.apps discussion group. Although others were interested in a free DOS, no one wanted to start such a project. So, I volunteered to do it.

On June 29, 1994, I posted this to comp.os.msdos.apps:

ANNOUNCEMENT OF PD-DOS PROJECT:

A few months ago, I posted articles relating to starting a public domain version of DOS. The general support for this at the time was strong, and many people agreed with the statement, "start writing!" So, I have...

Announcing the first effort to produce a PD-DOS. I have written up a “manifest” describing the goals of such a project and an outline of the work, as well as a “task list” that shows exactly what needs to be written. I’ll post those here, and let discussion follow.

If you are thinking about developing, or have ideas or suggestions for PD-DOS, I would appreciate direct email to me. If you just want to discuss the merits or morals of writing a PD-DOS, I’ll leave that to the net. I’ll check in from time to time to see how the discussion is going, and maybe contribute a little to what promises to be a very polarized debate!

I am excited about PD-DOS, and I am hoping I can get a group started!

—James Hall

PS—of course, if this already exists, please point me to the group leader so I can at least contribute!

Developers contacted me almost immediately. We had all written our own MS-DOS extensions, power tools that expanded what you could do on the MS-DOS command line. We pooled our utilities and looked on public FTP sites for public domain source code to other programs that replicated the features of MS-DOS.

A note about the name: When I started the project, I didn’t fully understand the nuances between “free software” and “public domain.” I assumed they were the same. And certainly, many of the free tools we found on FTP sites were released into the public domain. I adopted the name PD-DOS for Public Domain DOS. It took only a few weeks before I realized we wanted the protection of the GNU General Public License, which would make our DOS project a free software project. By late July, we changed the name to Free-DOS. Later, we dropped the hyphen to become FreeDOS.

How FreeDOS is used today

Over the years, developers have shared with me how they use FreeDOS to run embedded systems. My all-time favorite example is a developer who used FreeDOS to power a pinball machine. FreeDOS ran an application that controlled the board, tallied the score, and updated the back display. I don’t know exactly how it was built, but one way such a system could work is to have every bumper register a “key” on a keyboard bus and the application simply read from that input. I thought it was cool.

People sometimes forget about legacy software, but it pops up in unexpected places. I used to be campus CIO of a small university, and a faculty member once brought in some floppy disks with old research data on them. The data wasn't stored in plain text files, rather as DOS application data. None of our modern systems would read the old data files, so we booted a spare PC with FreeDOS, downloaded a shareware DOS program that could read the application data, and exported the data to plain text.

A few years ago, we ran a survey to see how people use FreeDOS. We found that people use FreeDOS in three different ways:

To play classic DOS games

You can play your favorite DOS games on FreeDOS. There are a lot of great classic games to play: Wolfenstein 3D, Doom, Commander Keen, Rise of the Triad, Jill of the Jungle, Duke Nukem, and many others!

To run legacy software

Need to recover data from an old business program? Or maybe you need to run a report from your old finance system? Just install your legacy software under FreeDOS, and you'll be good to go!

To develop embedded systems

If you support an older embedded system, you might be running DOS. And FreeDOS can fit in very well.

I think these still represent most FreeDOS usage these days, although I'll admit fewer people probably develop embedded systems on FreeDOS. Much of the embedded systems market has shifted to Linux, where there's more developer interest. I think the Raspberry Pi and other low-cost and low-power devices have made Linux in embedded devices very attractive, so you don't see DOS in embedded systems as much today.

You can probably add a fourth category to those FreeDOS use cases: updating BIOS. I get a lot of email and comments from people who still boot FreeDOS to update the BIOS in their computer system. DOS is still a safe way to do that.

History of the FreeDOS Kernel

Pasquale “Pat” Villani created the FreeDOS kernel, the core of the FreeDOS operating system. Sadly, Pat passed away in August 2011.

Pat and I were good friends. Although we never met in person, we chatted on the phone several times, and had lots and lots of email conversations, half the time about FreeDOS and half about just anything. Since Pat isn’t here to share his FreeDOS story, I thought I could attempt to retell his story as best I can.

To start, I’ll quote Pat’s now-defunct Open Source Depot website, where he once shared the history of his DOS kernel experiment, which later became the FreeDOS kernel.

It started with an experiment

DOS-C started in 1988 as an experiment in writing device drivers in C for Microsoft’s MS-DOS. Both block and character device drivers were written, along with special C data structures to match the MS-DOS request packet. It was then recognized that using the same techniques, an operating system could be written that would take advantage of the C language features and would require much less time to develop than the traditional assembly language techniques. Although UNIX had proven this earlier, it was not tried with a traditional PC operating system.

At this time, a minimal operating system using the device drivers written earlier along with a new 8086 interrupt API was developed. It was called XDOS and proved to be a functional operating

system. This new operating system was used to develop booting techniques and a C library SDK was developed for it.

XDOS enhancements were started in 1989 and MS-DOS was chosen as the new API. A more advanced architecture was also developed. This included the use of an IPL (intermediate program loader) to set up the operating environment prior to loading the operating system itself and reentrant system calls facilitating real-time applications. This version, known as NSS-DOS, was completed and demonstrated in 1991. As a result of these demonstrations, NSS was approached to supply source license for this operating system by a major defense contractor. The only new requirement—it had to run on 68K processors.

This presented a new challenge. Due to the MS-DOS model used for the API, NSS-DOS relied heavily on a segmented architecture. To meet this challenge, a major redesign of NSS-DOS was undertaken. New proprietary techniques were developed that allowed the same source to be compiled on a variety of hosts and with a wide range of compilers. This new version, DOS/NT, was the result of this new project. The kernel was redesigned as a microkernel along with logical separation of the file system, memory and task managers. A new DOS API was designed along with a new DOS SDK to guarantee portability. Additionally, all processor unique code was separated from the core functions. The result is the highly portable operating system that DOS/NT represents.

After a number of successful commercial applications, DOS/NT became part of both DOSEmu and FreeDOS.

Contributing to FreeDOS

Pat wanted to contribute his kernel to an open source software project that would find it useful. I think it was late 1994 that Pat emailed the DOSEmu folks, asking if they were interested in his DOS-compatible kernel. The DOSEmu team thought Pat's kernel was really interesting, and suggested he contribute his DOS kernel to the FreeDOS Project. The DOSEmu developers helped Pat get in touch with me.

Pat had created a DOS-like kernel that was feature-complete with earlier versions of MS-DOS, like MS-DOS 4 or 3.3. And Pat had licensed his kernel under the GNU General Public License, which meant we could include it in FreeDOS.

We immediately adopted Pat's kernel as the new FreeDOS kernel. Over time, other developers contributed to the FreeDOS kernel, including Aitor Santamaria, Arkady Belousov, Bernd Blaauwm Brian Reifsnyder, Charles Dye, Eduardo Casino, Eric Auer, Geraldo Netto, Jason Hood, Luchezar Georgiev, Ron Cemer, ror4, Steffen Kaiser, Tom Ehlert, and others. Some volunteered as kernel maintainers, including Jeremy Davis, Bart Oldeman, Jim Tabor, and John Price. Among these many

names, I'd like to give special kudos to Jim Tabor, who forklifted our kernel to support network redirection. Without this feature, FreeDOS would not have network and CD-ROM support.

If you're interested in learning more about the FreeDOS kernel's development and function or how to create a DOS-compatible kernel, you may also want to read [FreeDOS Kernel: An MS-DOS Emulator for Platform Independence and Embedded Systems Development](#) by Pat Villani.

History of the FreeDOS Distributions

They say that for any open source software project to get traction at the beginning, it needs to release early and release often. That's just what we did when we started the FreeDOS Project.

Our first goal was to identify the functionality of MS-DOS we wanted to replicate. Once we had a list of commands and features, we began searching for free software and public domain tools to fill those needs. We found several, including a neat replacement for PRINT called SPOOL, which operated in the background to print to the line printer when the computer was less busy. For those commands where we couldn't find existing tools, we wrote our own. Tim Norman was one of our first contributors, and started work on a replacement for the COMMAND shell, later dubbed FreeCOM.

Alpha: The early days

Once we had a core set of utilities, we released the FreeDOS Alpha 1 Distribution on September 16, 1994.

We didn't have a kernel yet, so FreeDOS was still incomplete at this point; you needed a copy of MS-DOS to use as the kernel. But the alpha release got the attention of other DOS developers, who soon contributed new features and new commands. With new features and functionality contributed by our developer community, we released FreeDOS Alpha 2 Distribution in very late 1994.

From there, we attempted regular releases of the FreeDOS Alpha. We released the FreeDOS Alpha 3 Distribution in January 1995. A few months later, we made the FreeDOS Alpha 4 Distribution sometime after May 20, 1995 and before June 18, 1995.

Our next two alpha releases took a while to get out the door. We were starting to grow as a community, and things were stabilizing. A little over a year later, we released the FreeDOS Alpha 5 Distribution on August 10, 1996. More than a year after that, we made the FreeDOS Alpha 6 Distribution in November 1996.

Beta: Not yet ready for prime time

All through the alpha releases, we were missing something; there was no installer for FreeDOS. To update an existing FreeDOS system, you had to manually transfer the new kernel to the system using the SYS program, then unzip the entire alpha package to your computer. We needed to make FreeDOS easier to install, which meant we needed an automated install program. So I spent a few weekends writing one.

Our first installer wasn't very pretty. It simply automated the setup steps via a batch file, then ran the install program to let you select what packages and package sets you wanted to install on your system. It just scrolled text from the bottom of the screen without console menus, but it worked. With this, we had the start of a new FreeDOS distribution.

The new installer deserved a new version for the next FreeDOS distribution. We were still far from "1.0," but with the new installer, we moved from alpha to beta.

We created code names for the beta releases because we thought it was an interesting beta-ish thing to do. Mostly it was just fun. There wasn't a scheme to the names; we just assigned a code name from whatever seemed relevant at the time.

I released the FreeDOS Beta 1 "Orlando" Distribution on April 24, 1998, just before I went to visit my brother in Orlando, Florida. I thought it would be cool to name the distribution based on that trip. I think I literally uploaded the new release, then finished packing so we could fly down the next morning.

A few months later, we released the FreeDOS Beta 2 "Marvin" Distribution on October 28, 1998. The name came from the old VAX system that we used in our campus computer lab around the time I created the FreeDOS Project. Sometime in October 1998, I returned to campus as part of an alumni event and learned that the university had finally decommissioned the last of the old system. I named the FreeDOS Beta 2 release after the venerable system I used so fondly as an undergraduate student.

We fell into a semi-regular update cycle, and released the FreeDOS Beta 3 “Ventura” Distribution a few months later, on April 22, 1999. I live in Minnesota; we had elected former WWE wrestler Jesse Ventura as our governor the previous fall, and he assumed office that January. By April, he’d probably done something really dumb, and I thought it was funny to use his name as the Beta 3 code name.

Around this time, someone started a discussion on the email list about the FreeDOS Project adopting a mascot. I thought a mascot would be cool, but I don’t think I pushed the idea of adopting an official FreeDOS mascot because I didn’t want to get distracted by the noise that would create. As a compromise for myself, I named the next beta release the FreeDOS Beta 4 “Lemur” Distribution on December 29, 1999 as a way of “adopting” a mascot when we really didn’t have one. I always thought lemurs looked cool, so I tried to insert the lemur as our mascot.

After a bit of a lag, we released the FreeDOS Beta 5 “Lara” Distribution on August 11, 2000. I played a lot of Tomb Raider on the PlayStation in the late 1990s. I think the Lara code name came about because I was really looking forward to the upcoming Tomb Raider Chronicles game (released in November 2000), featuring the character Lara Croft. This was advertised as the last Tomb Raider game in the series, so I memorialized it in the Beta 5 code name.

The next beta release also marks a sad time for me. Our beloved cat Midnite died in March 2001 during the run-up to the next release. I named the next beta after him, as the FreeDOS Beta 6 “Midnite” Distribution on March 30, 2001.

For the next FreeDOS release, I passed the distribution maintainer role to someone else. We released the FreeDOS Beta 7 “Spears” Distribution on September 8, 2001. I’m not completely sure about the origin of the name, but I think it had something to do with Britney Spears. Her self-titled album Britney would be released in November 2001, and in September 2001 we would have heard a ton of her music on the radio to advertise the upcoming album. So we probably had that on our minds when we picked the code name.

Jeremy Davis posted the next version of FreeDOS, releasing the FreeDOS Beta 8 “Nikita” Distribution on April 7, 2002, and the FreeDOS Beta 8 H1 (“Hot Release 1”) Distribution a few months later on September 15, 2002. I’m not sure where the “Nikita” name came from.

We changed distribution maintainers again for the next version. Bernd Blaauw didn’t think we were ready yet for a beta 9 version, so the next release was instead a release candidate. Bernd released the FreeDOS Beta 9 “Methusalem” RC1 Distribution on July 19, 2003. I suspect the code name came about because the Bible says Methusalem lived the longest at 969 years old, and Bernd might have been making a joke at how long DOS had been around.

After Beta 9 RC1, we decided the code names thing had run its course, so we stopped giving cute names to releases. The FreeDOS Beta 9 RC2 Distribution on September 1, 2003 was the first since the FreeDOS release not to have a code name.

We made our way towards the inevitable “1.0” by increments. I think everyone pretty much realized that the “1.0” release would be a big deal, and we wanted that version to be as perfect as we could make it. We weren’t satisfied with broken functionality, so each new distribution was a tiny step forward. We walked our way through the beta 9 release candidates in several stages: the FreeDOS Beta 9 RC3 Distribution (September 28, 2003), the FreeDOS Beta 9 RC4 Distribution (February 5, 2004), and the FreeDOS Beta 9 RC5 Distribution (April 20, 2004)

With five release candidates, we felt ready to finally release the FreeDOS Beta 9 Distribution on September 28, 2005. We made some service release updates to the Beta 9 soon after: the FreeDOS Beta 9 SR1 Distribution on November 30, 2004 and the FreeDOS Beta 9 SR2 Distribution a year later on November 30, 2005.

1.0 and beyond

We took three years to go through the beta 9 cycle, but we wanted to make sure we were ready before the official “1.0” release. The following year, we finally felt FreeDOS was ready! We released the FreeDOS 1.0 Distribution on September 3, 2006.

The “1.0” release was a big deal. Every software project considers the “1.0” release to be a major milestone. It’s when you decide everything is stable and ready for prime-time. But after “1.0,” what to do next? We’d mostly achieved parity with MS-DOS. You could run pretty much any DOS program on FreeDOS, except some versions of Windows. And MS-DOS compatibility wasn’t a moving target. So many of us didn’t feel much need to create an update to the FreeDOS distribution for some years.

It would be almost six years before the next version of FreeDOS. We posted the FreeDOS 1.1 Distribution on January 2, 2012. Technically, the release was ready on December 31, 2011 but that’s New Year’s Day, and we didn’t want to make a major release on a holiday. So we waited a day before I released it on the website. Because we had transitioned our FreeDOS News system to use GMT time, not local time, the news item was stamped with a January 2, 2012 date.

A few years later we’d started to collect enough updates to the FreeDOS core system that we decided to make a new FreeDOS release. But I wanted “1.2” to be more than a simple package update. I decided that our install program was outdated. We’d continued to make updates to it since the first beta distribution in 1998, but I thought we should rewrite the installer to reduce the number of steps to install FreeDOS. Jerome Shidel volunteered to write the new installer, based on a set of batch script power tools. Jerome’s “V8” tools created a whole new install process, basically one smart batch program.

Jerome made many pre-release FreeDOS distributions, ending with a series of two official release candidates before a final “1.2” version.

This time we decided to follow a holiday release cycle. Jerome released the FreeDOS 1.2 RC1 Distribution on October 31, 2016 (Halloween) and the FreeDOS 1.2 RC2 Distribution on November 24, 2016 (US Thanksgiving).

After much testing, and to much press coverage, we finally released the FreeDOS 1.2 Distribution on December 25, 2016 (Christmas).

We have already begun work on the next version of FreeDOS. The FreeDOS 1.3 Distribution will remain 16-bit, with the focus on a single-user command-line environment, just like classic DOS. FreeDOS can't truly be DOS if we change that. The next version will continue to run on old PCs, but will support new hardware with expanded driver support where possible. However, direct support for UEFI systems may be impossible.

History of the FreeDOS Logo

Our first logo was created by webmaster M. “Hannibal” Toal when he created our first website in November 1996. Until then, we didn’t have a website, only an FTP site on the University of North Carolina’s SunSITE system. Hannibal created the logo using Windows Paint, so it’s no surprise that it uses simple colors and standard Windows fonts: Impact and Times New Roman.



Several years later, we decided the original oval logo was starting to look dated. Several FreeDOS users attempted new logos for us, but we liked Ben Rouner’s best. His logo was a sleek, modern spin that was better suited to the banner on a website. We adopted this blue stamped logo in August or September 2001.

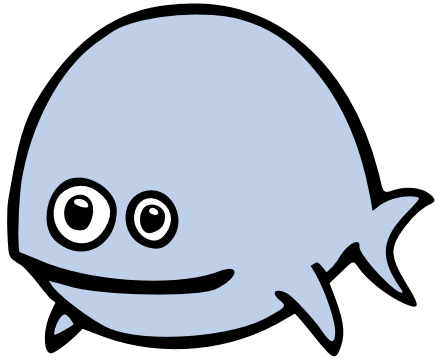
FREEDOS

This logo remained popular for several years. It was around this time that some started to wonder if FreeDOS should adopt an official mascot. After all, Linux had the penguin and BSD had the daemon in sneakers, and GNU had the gnu, so maybe FreeDOS should have a mascot, too. When I first considered mascots back in 1999, I thought a lemur would look neat. I always liked lemurs. But after a while, I thought FreeDOS should have a mascot that paired well with the Linux penguin. FreeDOS was a free operating system like Linux, so I thought it natural that someone might create a composite image that combined the Linux and FreeDOS mascots, maybe sitting next to each other. I thought a seal would be a great idea; imagine a seal and a penguin hanging out together. But we already had a SEAL graphical desktop package, and the name conflict seemed pretty obvious.

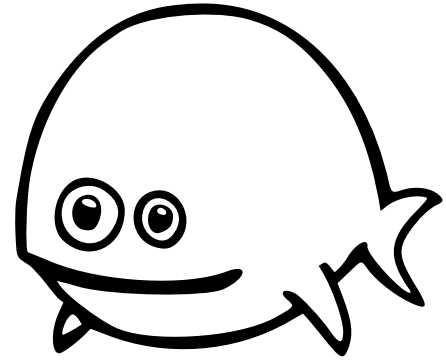
One user had created a FreeDOS mascot as a kind of blue ball thing with the oval logo printed on it, but that was never made official. Someone else submitted a new FreeDOS logo that used a fish icon, claiming that the fish represented freedom. For some reason the fish caught on.

Digital artist Bas Snabilie wrote to me with his take on a FreeDOS fish. His fish mascot was adorable and more cartoony than the other proposed FreeDOS fish. Bas also created a version of the FreeDOS fish that incorporated new logo text, including an alternate boxed wordmark logo that replaced the "O" in FreeDOS with the new FreeDOS fish. We adopted this new FreeDOS mascot, and the new logo, in February or March 2004.





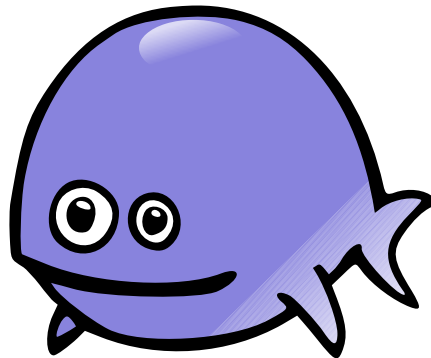
FreeDOS



FreeDOS

In case you're curious, the FreeDOS fish didn't have a name for quite a while. We later dubbed him "Blinky" because of his googly eye. The name stuck.

Later, Rikard Lang slightly modified the FreeDOS fish and turned Blinky purple with a shiny spot on his head. While this glossy fish logo was never used on the FreeDOS website and thus never became an official logo, we have adopted it for use on certain social media sites.



We've continued to incorporate Blinky in the FreeDOS logo. On January 1, 2010, we refreshed the FreeDOS website with a new look, including a slightly updated logo. The new white wordmark logo used the same FreeDOS fish from our boxed wordmark logo with the text in white with a black drop-shadow.

FreeDOS 


Over time, the only updates we've made have been to convert the FreeDOS logos to scalable vector graphics, or SVG. Many thanks to FreeDOS developer Mateusz Viste for converting many of our logos to SVG. The original oval logo was GIF, the stamped logo was Photoshop converted to PNG, the FreeDOS fish logo was JPG, and the white wordmark logo was PNG. While these raster images work well to represent an image, we have made them smaller and more scalable by adapting them to vector graphics.

History of the FreeDOS Website

The FreeDOS Project has been around a long time, actually predating much of the World Wide Web. Back in 1994, the whole Web thing was a pretty new idea, so it didn't occur to us to create a website until a few years later.


1996–1998

Our first website was created by M. "Hannibal" Toal, who stepped in as project coordinator for a short time. I'm not sure exactly when we set up our first website, but I think it was around November 6, 1996. This snapshot from June 1998 still has the same look: white text on a black background with the original oval logo.



Welcome to the FreeDOS Homepage

FreeDOS
Site Index



Downloads
[FreeDOS Beta 1](#)
7.9 MB Download!
[File Highlights](#)
[How to install](#)
[Disk Image](#)
(1M)
[Micro-C \(.ZM\)](#)

FreeDOS Info
[Info Highlights](#)
[FreeDOS Links](#)
[Compatibility](#)
[Maintainer List](#)
[GNU License](#)
[FAQ/Manifesto](#)

Mailing List
[Subscriptions](#)
[Archives](#)

Mirrors
[Home \(Texas\)](#)
[Sunsite/UNC](#)

Cool! Get the FreeDOS Beta 1 "Orlando" Release!

What's New with FreeDOS?

2 May: Hey! Minor revision to Orlando release [News Item 006](#) [Download!](#)

25 Apr: New FreeDOS available! [News Item 003](#)

25 Apr: Call for volunteers - FreeDOS compiler project [News Item 005](#)

25 Apr: FreeDOS compatibility list available [News Item 004](#) [Go there!](#)

16 Apr: FreeDOS Beta 1 "Orlando" release due soon. [News Item 002](#)

16 Apr: File fdalpha5.zip now includes Installer v1.2. [Download!](#)

15 Apr: Can someone help us fix command.com? See [Tech Note 002](#)

15 Apr: Can FreeDOS use high capacity HDD's? Not yet. See [Tech Note 001](#)

What is FreeDOS?

FreeDOS aims to be a complete, free, 100% MS-DOS compatible operating system. Though this goal has not yet been achieved, we're not too far off the mark folks. [Download the latest version](#) and see for yourself.

What is FreeDOS not?

At this time, it is not planned to add enhancements or advanced features to FreeDOS such as multitasking, protected mode operation, or a GUI. The reason for this is that we first seek to duplicate the original functionality of DOS, because such an operating system is still useful, but there is not a free one. If you need advanced features in a free operating system, we suggest [Linux](#). Don't worry, you won't hurt our feelings.

So, what good is FreeDOS then?

FreeDOS is ideal for businesses who wish to distribute software without having to pay a royalty for use of MS-DOS. FreeDOS will also work on old hardware, in DOS Boxes in OS/2, and as a kernel for DOSEMU under Linux. FreeDOS is also an invaluable resource for individuals who would like to develop their own operating system. While there are many Free operating systems out there, no other 16-bit DOS compatible operating system exists.

What do you mean by "free" anyway?


By "free", we mean just that. FreeDOS is absolutely and 100% free, source code and all, for personal or business usage, because it is released under the [GNU General Public License](#). The GNU license, developed by the [Free Software Foundation](#), is the same one used by Emacs and Linux. FreeDOS is distributed in the hopes it will be useful, but comes with absolutely no warranty, and all copyrights are retained by the original authors.

Group! How can I contribute to FreeDOS?

I returned to FreeDOS after a short absence and Hannibal handed the webmaster duties to me. Unfortunately, I didn't know much about how to edit a website. I pretty much left the site as-is until I had learned enough HTML to be dangerous.

1998–1999

Starting sometime late 1998, I began working on an update to the FreeDOS website. I wanted the new website to be easier to read. More websites were using a black-on-white color scheme, which I found easier on the eyes. After some months working on a new design, I put live the updated website on January 1, 1999. A snapshot from January 1999 shows the updated style: black text on a white background with a FreeDOS banner ad and the original oval logo.



The FreeDOS Project

Site links: FAQ Spec Download News Projects FD-DOC Join About Contact	Mirrors of this site: [freedos.org sunsite.unc.edu Alaska Australia Japan Portugese Japanese!] <p>21 Jan 1999: The FreeDOS Manifesto has been moved to the freedos.org web site. Check it out! Includes translations into several languages.</p> <p>18 Jan 1999: Interested in the Freemacs editor; a GNU Emacs clone for DOS? Check out all the documentation that we've added in the FreeDOS Documentation Project (FD-DOC) Mini HOWTOs section.</p> <p>17 Jan 1999: Check out the MacBochs project, a PC emulator for the Macintosh, to see FreeDOS in action!</p> <p>17 Jan 1999: Steve Miller reports that he was able to build the FreeDOS Kernel system, using Borland Turbo-C. People have been asking if the kernel will compile under different compilers, so I thought this was cool. newsitem024</p> <p>17 Jan 1999: Jim Hall comments on the FreeDOS Spec. newsitem023.</p> <p>17 Jan 1999: In response to questions on the mailing list, we have a simple piece of code for swapping out your memory to disk in order to spawn a process with full memory. technote010</p> <p>9 Jan 1999: Information on how to create a bootable CD-ROM using FreeDOS! technote009</p> <p>9 Jan 1999: A FreeDOS success story. Great news for FreeDOS! newsitem022</p> <p>3 Jan 1999: There are some workarounds available for some missing documentation with the FreeDOS kernel. technote008</p> <p>1 Jan 1999: The FreeDOS web site has been re-designed. Some links have moved. If you have bookmarks into the old site, you may need to update them.</p> <p>17 Dec 1998: The FreeDOS Documentation Project (FD-DOC) page has been moved to the freedos.org site! FD-DOC aims to produce high-quality documentation for all aspects of FreeDOS.</p> <p>I'll try to keep about a month's worth of important FreeDOS news on this page. For more news, see the News archive.</p>
---	---

This [The FreeDOS WebRing](#) site owned by [M "Hannibal" Toa](#) and [Jim Hall](#).
[\[Previous 5 Sites | Skip Previous | Previous | Next | Skip Next | Next 5 Sites | Random Site | List Sites \]](#)

You are visitor number **9 8 5 4 2 9** (Courtesy of [WebCounter](#))

1999

Later that year, I updated the website design slightly, using a blue title bar and yellow navigation bar. I also added a poll feature to the sidebar, although this was meant more for fun than information gathering. The new website went live in mid- to late September 1999.



The FreeDOS Project

[[Download!](#)] [[About](#)] [[Contact](#)] [[Links](#)] [[Projects](#)] [[Join](#)] [[Images](#)] [[Software](#)] [[Bugs](#)] [[Docs: FAQ, Spec, ...](#)]



I am _ years old:

- <10
- 10-15
- 16-25
- 26-39
- 40-55
- >55

[Vote](#) | [Results](#)

Some notes on Year2000 and DOS

posted by jhall 7/Oct/99

Some notes on the year 2000 and DOS: [Technote051](#)

Technote: Memory management problems

posted by jhall 7/Oct/99

John Price (kernel maintainer) posted this note to the FreeDOS [Mailing List](#). There seems to be something wrong with the memory management in the kernel. Any help would be appreciated! [Technote050](#)

Technote: deleted files

posted by jhall 7/Oct/99

John Price posted this to the FreeDOS [mailing list](#) about how DOS deals with deleted files. For reference, I thought I would post it here. [Technote049](#)

FreeDOS forum on MSN

posted by jhall 5/Oct/99

[Brent Metzler](#) wrote: *Cool, what a coincidence. FreeDOS has its own forum on MSN*

Jim Hall adds: *Now **that's** recognition from the big boys! In Microsoft's own words: "DOS is still a viable choice for millions of computers worldwide and FreeDOS offers an alternative to commercial DOS operating systems."*

Why OpenDOS is not free

posted by jhall 30/Sep/99

Again, I'm cleaning up my files, and I uncovered this one: an [article](#) explaining a few points why Caldera's OpenDOS (DR-DOS) is not really free.

A history of DOS

posted by jhall 30/Sep/99

I am cleaning up some files I was hanging onto, and I came across this- a [history](#) of the DOS operating system. Thought I'd post it for a bit of nostalgia.

Maintainers list has moved!

posted by jhall 30/Sep/99

I have moved the FreeDOS maintainers list from my [personal site](#) to a new [Software](#) page on the FreeDOS web page. Same LSM files, new look. I'm trying to centralize stuff onto the FreeDOS web site, where possible. It no longer made much sense for me to maintain the maintainers list on my personal site at isd.net, and try to maintain a software archive on the FreeDOS site. The submit form is now gone. If you are a maintainer for a

2000

I updated the FreeDOS website design again in Spring 2000. The most visible change was in the header, with a series of stripes behind the "FreeDOS Project" wordmark. Technically, I don't consider that a new FreeDOS logo, just a graphical decoration around the logo. This new striped web update went live in early May 2000.


The FreeDOS Project

[Download!](#) | [About](#) | [Contact](#) | [Links](#) | [Projects](#) | [Join](#) | [Images](#) | [Software](#) | [Bugs](#) | [Docs: FAQ, Spec. ..](#)

FreeDOS:
oh, yeah **BABY!**

Go back to using fonts on the web site?

yes

no

Vote [\[Results \]](#)

[See also: [News Archive](#) | [In The News](#)]

Updated FDXMS
 posted by jhall May 9 2000
 Louis P. Santillan writes: *Well..I've cleaned up my NASM port a bit. I now seem to have the addressing opcodes the same size (TASM "optimizes" in a very peculiar fashion; sometimes it does and sometimes it doesn't). Also, I noticed that the nearly all of the XOR AX, AX (replace AX for any other register) are generated slightly differently fom TASM though NDISASM recognizes both forms. Oddly, some of addresses are still off and and the generated binary is still 9 bytes larger and crashes on every single run on my machine and in bochs. :(You can [download](#) this slightly updated version. However, since I do not have TASM to assemble the original, and therefore cannot apply a much needed patch to delay. However, I could provide anyone with the patched source and if they could kindly assemble it for me, I (and probably others ;) would be grateful.*

CuteMouse
 posted by jhall May 9 2000
[Nagy Daniel](#) has released an update to the CuteMouse mouse driver: This is a tiny mouse driver for serial and PS/2 mice. You can [download](#) it from the official site, or grab it from our [files archive](#).

RealDOS 2.0 beta
 posted by jhall May 7 2000
[\[Web site\]](#) [DOSProfi](#) has released a beta of his next version of RealDOS (a DOS distribution based on FreeDOS): *RealDOS 2.0 Beta 1 DiskSet 1 is now available. Go to <http://www.realdos.de/english>. Includes Kernel 2019 and FreeCOM 0.79.*

EURO support for FreeDOS
 posted by jhall May 7 2000
 Aitor Santamaria Merino writes: *I am pleased to announce the first release of the EURO utility, that will provide Euro management for FreeDOS (and other DOSes). With EURO, you will be able to display the Euro symbol in our DOS, as well as to produce the Euro symbol with your keyboard, by using the combination AltGr+E (RightAlt+E). As I still haven't prepared a site, I will provide the program (released under GPL license) via e-mail. Please, [send email](#) if you want to have the EURO utility package. Currently available: *EURO 0.9 (beta1) English (19.8 Kb) - EURO utility package*
 I have requested a copy of this program, and I will post it on the FreeDOS site.
Update 5/9/00: This has been mirrored in the files archive on the FreeDOS site: [go there](#).
 Also from: [Germany](#), [Austria](#)*

Anyone have a copy of the old kernel page?

Mirrors of this site:

 [freedos.org](#)

 [Australia](#)

 [Italian!](#)

 [Japanese!](#)

 [Portuguese!](#)

 [German!](#)

To mirror, download [this file](#) (1.2MB)

2000

I made a small adjustment again in late May 2000, adding a mint green background to the titles of each news item. I'm sure I felt inspired by other websites that used a different color to set off article titles, although I'm a bit confused when I look at this design now. Green didn't really fit with the dark blue banner.


The FreeDOS Project

[\[Download!\]](#) [\[About\]](#) [\[Contact\]](#) [\[Links\]](#) [\[Projects\]](#) [\[Join\]](#) [\[Images\]](#) [\[Software\]](#) [\[Bugs\]](#) [\[Docs: FAQ, Spec. ..\]](#)



I ported FreeDOS to my:

- Mac
- Apollo
- toaster
- microwave

[\[Results\]](#)

[See also: [News Archive](#) | [In The News](#)]

DNS Cool Stuff

posted by jhall May 19 2000

 I've known about this for a while, but I thought I'd post it here before I forgot about it again: some kind soul has registered the [freedos.com](#) domain, and put up a simple page that points the user back to [freedos.org](#). Too often, you hear about domain name "squatters" who grab a domain name, then charge you an arm and a leg to buy it back so customers/visitors won't confuse the two sites. But you never hear about the "good guys" who purchase a domain name to keep it from falling in the hands of squatters. Thanks, Moshe!

FreeDOS at work: dedicated terminals

posted by jhall May 19 2000

Colin Elliott emailed me a great example how he was able to bring old hardware to life at his company using FreeDOS: *I've been using FreeDOS for a while now. It started at work when we put in a Citrix MetaFrame Terminal server farm. We dug up a bunch of old 486's to use as client machines. However was ran into the usual problem with lisencing. FreeDOS to the rescue, and now I'm a hero. Ok not quite, but getting FreeDOS in opened up the door for lots of other Open Source software as well. We now have several Linux Servers running Samba. Anyway ... FreeDOS was, in my organization at least, the thin edge of the wedge. Imagine for a moment senior managers: "What do you mean half of our desktop's already run on open source?"*

FreeDOS at work: flash BIOS updates

posted by jhall May 19 2000

Jim Stiles wrote to tell me how he has used FreeDOS at work to update a flash BIOS. I often hear from vendors who are using FreeDOS to boot a flash BIOS update floppy, but rarely have I heard from "techs in the field" who use FreeDOS for this: *I want to thank the FreeDOS project. This afternoon my boss told me to upgrade the Flash BIOS on my DELL computer (I am not sure why). In order to do this, one must boot up in MS-DOS. Because NT 4.0 does not give the user that option (everyone else in the office is a Win98 fiend), I had to get a DOS boot disk and my DOS 6.22 boot disk is at home. So I downloaded the MINI BETA4 distribution of FreeDOS and made a bootable disk. After rebooting with FreeDOS, the program that converts the BIOS from A03 to A08 worked perfectly. From what I can tell with this test, FreeDOS appears to be an excellent operating system for computers operating unattended at remote locations.*

FreeDOS on SPARC?

posted by jhall May 15 2000

This has to be the most innovative port ideas I've seen, but it sounds cool! [Terry Lampoudi](#) writes: *So, I've been fooling around with a bunch of things lately and I think I'll start mucking around w/ porting FreeDOS to Sparc (mainly cause there is no DOS for SPARC architectures that I know of, secondly cause I seem to be on some real good crack lately). Any objections? Suggestions?*

Mirrors of this site:

-  [freedos.org](#)
-  [Australia](#)
-  [Italian!](#)
-  [Japanese!](#)
-  [Portuguese!](#)
-  [German!](#)
-  [Spanish!](#)

To mirror, download [this file](#) (1.2MB)

2001

In early 2001, I again decided to change the FreeDOS website. I chose a unified blue-and-gray color scheme, with black-on-white text. I updated the website sometime in mid-February 2001.



Search the FreeDOS web site:



It makes Linus jealous.

[About](#)

[Contact](#)

[Get FreeDOS!](#)

[Need help?](#)

[Mailing list](#)

[Cool links](#)

[Our projects](#)

[Software list](#)

[Images](#)

[Report bugs](#)

[Docs](#)

[FAQ](#)

[Spec](#)

Mirrors of this site |

[Argentina](#) |

[Austria](#) | [Estonia](#)

| [Germany](#) |

[Latvia](#) |

[Netherlands](#) |

[Poland](#) | [South](#)

[Africa](#) | [U.K.](#) |

[U.S.](#)

Mirrors in other

languages |

[French](#) | [German](#)

| [Italian](#) |

[Japanese](#) |

[Portuguese](#) |

[Russian](#) |

[Spanish\(Chile\)](#) |

[Spanish\(Spain\)](#) |

[Spanish\(U.S.\)](#)

To mirror:

download [this file](#) (1.5MB) and read these [instructions](#).

[News Archive](#) | [In The News](#)

New SEAL coming soon

posted Feb 25 2001 by jhall

Callum Lawson writes to announce: *there is a new distribution of seal coming around. it wis called starseal and is written by me - Neptune28487. It has a KDE interface and is quite a small distribution. Downloads will be available soon at [BadSeal's Homepage](#).*

Microsoft Clarifies Jim Allchin's Statements

posted Feb 25 2001 by jhall

If you are a regular reader of [Slashdot](#), you saw earlier this week that Microsoft has [attempted to clarify](#) Jim Allchin's statements about how Open Source Software is bad. The article is on [Yahoo!](#) and says (summary): *Microsoft representatives assert that Platforms Group Vice President Jim Allchin was "misunderstood" when he expressed concerns last week about the long-term industry effects of open-source software. ... Allchin's concerns, eWEEK was told, stem from GPL paragraph (2B), which states, "You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License."*

In other words, Microsoft representatives warned, "anyone who adds or innovates under the GPL agrees to make the resulting code, in its entirety, available for all to use ... [which] might constrain innovating stemming from taxpayer-funded software development."

Allchin, according to the company, does not have the same concerns about all open-source approaches in general. "There are other kinds of open-source licenses that encourage third-party development but without the same constraints, including the BSD license," Microsoft representatives said.

Again, I think Allchin is full of hooey. [RMS's response](#) (see also [this](#)) is as you'd guess - the delineation between Open Source and the Free Software Movement, and what the differences are, as well as his non-opinion of "intellectual property".

Menu-driven navigator for FreeDOS?

posted Feb 25 2001 by jhall

[Bill Bernauer](#) has expressed interest in writing a kind of 'shell' for FreeDOS, along the same lines as X-Tree and DOS Navigator. Here is Bill's email, and a few replies. If you are interested in helping with this project, please [email Bill](#). *I have been lurking here for a while, and wonder if you are interested in a project I have just started. I have a client using MS-DOS 6.22 who would like a (kind of) shell integrating several of the external dos commands, such as attrib, defrag, scandisk, format, etc. These will be integrated into the program, rather than shelling out to run the version that comes with dos. So the versions that come with dos could be deleted. I'm seeing this now as kind of like the old X-TREE on steroids. It seems to me that it wouldn't be difficult to write this as generic to run on just about any version or flavor of dos. Thus my question: If there is an interest, I would be willing to make it completely available to be included as a part of FreeDos. ... So let me know what you think!*

[Newsitem095](#)

Beta6 update (and FreeDOS Install Program)

posted Feb 25 2001 by jhall

I had promised a few weeks ago that I would try to get the Beta6 distribution out there by the end of February. And that's just around the corner here. The bottom line: I'm not going to be ready by the end of the month - I've barely started. Expect it in March.

What has been keeping me away from the Beta6 is the FreeDOS Install program. I have been struggling since the start of the year with how to cleanup the code in the Install program. I have taken apart several components of the Install program, scraped away some of the mess, and put things mostly back into order. This leads to an announcement: Version 3.7 of the [Install Program](#) has been released! This was a long time in coming, and contains lots of cleanup. There are no new features in this release. I am currently debating whether I should re-write other portions of the Install program, to make this more modular and easier to maintain. If you have any recommendations, please [Email me](#). Otherwise, I'll start tackling the other bugs now. But not until after the

2001-2004

Several months later, our original oval logo was looking dated. Ben Rouner's new logo was a sleek, modern spin that was better suited for the banner on a website. We adopted the new logo in August or September 2001, accompanied by a website redesign with blue highlight colors and a white background.

Mobile/PDA (RSS)

FREEDOS

Search the FreeDOS web site:

9/8/01 FreeDOS Beta 7 ("SPEARS") Distribution is [now available](#) on ibiblio. Please read the readme files as they may contain important information that should be read before downloading/installing FreeDOS.

Rene release of XCOPY 1.0
posted Sep 20 2001 by jhall

I have posted a suggested replacement of the XCOPY program, which has been submitted by René Ableidinger. You'll find it [here](#) on the FreeDOS archive at [ibiblio](#). This version of XCOPY is *not* the official version by Joe (which is part of the latest FreeDOS distribution.) This is a new version written by René Ableidinger and is an unofficial version. Discussion about the two versions of XCOPY should be posted to the FreeDOS [mailing list](#).

FreeDOS web site redesign
posted Sep 20 2001 by jhall

Yes, the FreeDOS web site redesign has finally started to happen! I've updated all the index.html files, plus a few other pages that get hit a lot. The CGI-generated pages have not yet been updated, but that is coming soon. In the meantime, if you find that any of the redesigned pages have bad links, please [email me](#). Also: the new design should allow mirror sites to put the mirror anywhere in their doc root, not just on '/freedos'. So if you have problems posting the redesigned site elsewhere in your doc root, let me know. Thanks!

Update: I just refreshed the mirror.tar.gz ahead of schedule, so you can download this and get the redesign on your site to try it out.


ESSoft-GUI for DOS
posted Sep 17 2001 by jhall

A new GUI for DOS has hit the scene. From their [web site](#): *Welcome to the official web site of ESSoft. We currently offer many free applications for DOS, including our graphical user interface for DOS ESSoft-GUI . As well as our DOS software, ESSoft is also currently working on some Microsoft Windows software which could be released soon, and perhaps in the near future we may release some software for GNU/Linux. Looks like [screenshots](#) aren't available yet, but should be soon. ESSoft-GUI is also soon to be under the [GNU GPL](#) software licence.*

Using DR-DOS FAT32 in FreeDOS?
posted Sep 17 2001 by jhall


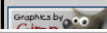
Recently, a user sent me this note about adding FAT32 support to FreeDOS using the [drfat32](#) program from DR-DOS. Although the FreeDOS kernel is adding FAT32 support directly, I thought I would make this note available as a technote, anyway. So if you already own a copy of DR-DOS in addition to FreeDOS, this may be something you could look at to read your FAT32 partitions from within FreeDOS. [Technote146](#)

FreeDOS wins New Cyber Tech Award
posted Sep 17 2001 by jhall

FreeDOS has won a web design award: [New Cyber Tech](#) is the place to visit for all of your free web development tools  needs. *New Cyber Tech has searched the entire web to find all the best free web development tools out there. New Cyber Tech has done all of the work for you. New Cyber Tech has spent countless hours searching the world wide web for all the best free web development tools that the entire web has to offer.* Click on the image at right to see our award.

FreeDOS web site redesign (update)
posted Sep 16 2001 by jhall

Thanks, everyone, for the great feedback on the FreeDOS web site. Unfortunately, this [wasn't the best week](#) to work on the redesign, as it turns out. However, I am trying to keep things moving. I am trying to tweak one or two final things before I put this live. Expect the redesign to go up within a few days. If things seem a little broken on the redesign in the meantime, it probably means I'm working on something

Navigation:
[About](#)
[Contact](#)
[Download!](#)
[Help!](#)
[Images](#)
[Join](#)
[Links](#)
[In The News](#)
[Technotes](#)
[Projects](#)
[Software](#)
Bugs
Docs
[FAQ](#)
[Spec](#)
Mirrors:
[Australia](#)
[Austria](#)
[Czech](#)
[U.K.](#)
[freedos.com](#)
[darklogic.org](#)
[fdos.org](#)
[tomcort.com](#)
Languages
mirrors:
[French](#)
[German](#)
[Japanese](#)
[Portuguese](#)
[Russian](#)
[Spanish\(Spain\)](#)
[Spanish\(USA\)](#)
To mirror:
[instructions](#)
[mirror.tar.gz](#) (1.5MB)

Graphics by 

That website design stuck around for a few years with only a few minor color tweaks in the design. We didn't update the web design again until we decided to change the FreeDOS logo.

2004–2006

In February or March 2004, I created an updated website design that used the new FreeDOS boxed wordmark logo with the FreeDOS fish. We would keep this website design for several years. Over time, we made a few tweaks here and there, such as moving the blue swirls decorative banner from the top of the page to just under the logo, but the design concept remained.

[home]
Mobile edition | RSS data | Sidebar tab

Search:

Search



[Download FreeDOS](#)

[Download FreeDOS](#)

[About](#)
[Contact](#)
[Links](#)
[Mailing Lists](#)
[Projects](#)
[Software](#)
[Web Images](#)

[Bugzilla](#)

[In The News](#)
[.. Technotes](#)
[.. Newsitems](#)
[.. News bits](#)

[FreeDOS on Laptops](#)

[Sourceforge](#)
[.. Kernel](#)
[.. FreeCOM](#)

[Documentation](#)
[.. Spec](#)
[.. HOWTOs](#)
[.. Help](#)
[.. FAQ](#)

Mirrors:
[Australia](#)
[Austria](#)
[Brazil](#)
[Estonia](#)
[Greece](#)
[Germany](#)
[Germany](#)
[Germany](#)
[Hungary](#)
[Italy](#)
[Latvia](#)
[Netherlands](#)
[Norway](#)
[Portugal](#)
[Spain](#)
[Sweden](#)
[UK \(doosh.net\)](#)
[\(US\)darklogic.org](#)
[\(US\)fdos.org](#)

7 Feb 2004 - Steve Nickolas has posted ODIN 0.6, a slimmed down one-disk FreeDOS distribution. See [fd-odin.dosius.com](#) for primary Odin site. Also available [at ibiblio](#) and [fdos.org](#).

5 Feb 2004 - Bernd Blaauw has released the [FreeDOS Beta9 pre-release4](#) distribution. Get it [at ibiblio](#). (If you want only the binaries, as an alternative, download the beta9pr4.zip binary zip package [from ibiblio](#) [1.2MB])

13 Aug 2003 - We are currently in a "patch and cleanup" cycle. Aitor has updated the "TODO" list of things that seem missing. See the [v.1.0 TODO list](#).

Warning: ASUS motherboards and FreeDOS! ASUS motherboards which contain FreeDOS for their CrashFreeBIOS function sometimes ship with an incomplete FreeDOS installer on the CD-ROM. Do not try to install FreeDOS with it. Use the CD-ROM only for BIOS flashing as intended. Otherwise you could render your system unbootable. See also [Technote211](#).

EMM386 release candidate #1
24 Mar 2004 by jhall
Micheal Devore writes: *The first release candidate version of EMM386 with VCPI support is available at [ftp site](#) in the files EMM386.ZIP and EMM386SR.ZIP, as executable and ASM+C source. Note well: the uncompressed executable name is now EMM386.EXE, and not the previous test release name of EMM38664.EXE This version of EMM386 corrects an incompatibility with Duke3D using the high resolution 800x600 mode, and potentially with similar DOS extended programs. The NOEMS option of EMM386 has been corrected to allocate more memory for larger memory machines (>192M), as well as allocate additional memory to VCPI. EMM386 parsing has been slightly improved. It also has a (completely untested) check for VMware with auto exclusion of UMB's in the range 0E800-0EFFF. Please bang on this version of EMM386 as hard as you can to uncover any problems affecting maximum compatibility with all known extenders and DOS extended programs, as well as various memory setups. This version is a candidate for next official release of EMM386 ... ([Read more...](#)) This release candidate has also been mirrored [at ibiblio](#).*

FreeDOS help: 1.0.3
23 Mar 2004 by jhall
Robert Platt writes: *Just loaded up a new version of [HTML Help](#). Version 1.0.3 adds a search function. MS Help had one, so its only right that FreeDOS Help should have one. In spite of adding this big new feature, there have been various code improvements which means a "decrease" in binary size... cool! Get it at [web site](#).*

More FreeDOS networking
21 Mar 2004 by jhall
Someone just emailed me to ask about FreeDOS networking, so I thought I'd post an updated news item about it. If you're interested in putting FreeDOS on a network, you might be interested in [Technote157](#) about the topic, or [Ein Windows-Netzwerk unter FreeDOS](#) (German). Microsoft also posted their [Network Client for MS-DOS](#) that works under FreeDOS. There's a web server for DOS [included in Watt-32](#), as well as some other goodies, including a Gnutella client!

FreeDOS at work
14 Mar 2004 by jhall
Tassilo points out another place where FreeDOS is being used "in the wild." *I was surprised that the new Pump (mp3 player) isnt using Linux anymore its using FreeDOS as "default" OS. See [Technical Details On PUMP II](#) (German) (also [in English](#).) Pump has had a [brief mention](#) before on FreeDOS.org, but never as a news item. It's great to see FreeDOS being used in more embedded systems.*

Disk utility BOOTFIX (updated)
13 Mar 2004 by jhall
Arkady writes: *I prepare first edition of BOOTFIX - utility to check boot sector validness. Please, test it, and report me if something is wrong.*

2006

On February 6, 2006, I rebuilt the FreeDOS website using divs and stylesheets, following a growing trend. The website look and feel remained the same, but the construction was more modern.

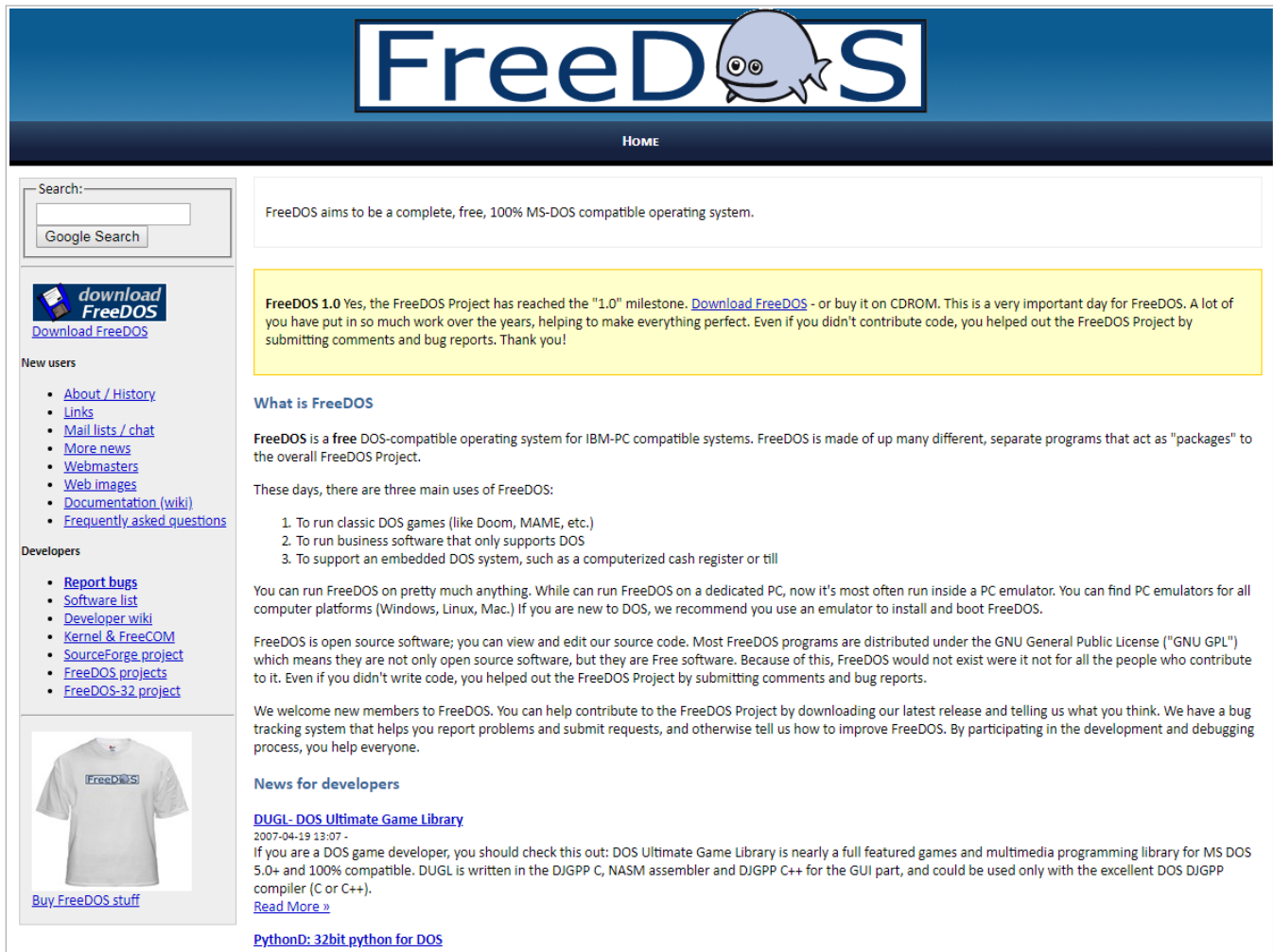
In late July or early August 2006, we tweaked the FreeDOS website design to use a flattened appearance that had become popular on other websites at the time.

We finally released the FreeDOS 1.0 distribution on September 3, 2006. With our milestone release came an update to the FreeDOS website. The new website incorporated a "What is FreeDOS" section on the front page, including a brief description of the ways most people used FreeDOS: to run classic DOS games, to run legacy software, and to do embedded development.

2007–2009

Sometime in April 2007, I made a minor design change to the website, to put a blue gradient background behind the FreeDOS logo with a dark blue gradient as a sort of page title bar.

I'm not able to track changes to the website very well after this. I didn't keep a history of changes to the website. However, sometime in November 2008 or very early December 2008, we updated the website again.



FreeDOS aims to be a complete, free, 100% MS-DOS compatible operating system.

FreeDOS 1.0 Yes, the FreeDOS Project has reached the "1.0" milestone. [Download FreeDOS](#) - or buy it on CDROM. This is a very important day for FreeDOS. A lot of you have put in so much work over the years, helping to make everything perfect. Even if you didn't contribute code, you helped out the FreeDOS Project by submitting comments and bug reports. Thank you!

What is FreeDOS

FreeDOS is a free DOS-compatible operating system for IBM-PC compatible systems. FreeDOS is made of up many different, separate programs that act as "packages" to the overall FreeDOS Project.

These days, there are three main uses of FreeDOS:

1. To run classic DOS games (like Doom, MAME, etc.)
2. To run business software that only supports DOS
3. To support an embedded DOS system, such as a computerized cash register or till

You can run FreeDOS on pretty much anything. While can run FreeDOS on a dedicated PC, now it's most often run inside a PC emulator. You can find PC emulators for all computer platforms (Windows, Linux, Mac.) If you are new to DOS, we recommend you use an emulator to install and boot FreeDOS.

FreeDOS is open source software; you can view and edit our source code. Most FreeDOS programs are distributed under the GNU General Public License ("GNU GPL") which means they are not only open source software, but they are Free software. Because of this, FreeDOS would not exist were it not for all the people who contribute to it. Even if you didn't write code, you helped out the FreeDOS Project by submitting comments and bug reports.

We welcome new members to FreeDOS. You can help contribute to the FreeDOS Project by downloading our latest release and telling us what you think. We have a bug tracking system that helps you report problems and submit requests, and otherwise tell us how to improve FreeDOS. By participating in the development and debugging process, you help everyone.

News for developers

[DUGL- DOS Ultimate Game Library](#)
2007-04-19 13:07 -
If you are a DOS game developer, you should check this out: DOS Ultimate Game Library is nearly a full featured games and multimedia programming library for MS DOS 5.0+ and 100% compatible. DUGL is written in the DJGPP C, NASM assembler and DJGPP C++ for the GUI part, and could be used only with the excellent DOS DJGPP compiler (C or C++).
[Read More »](#)

[PythonD: 32bit python for DOS](#)
2007-04-19 13:07 -

New users

- [About / History](#)
- [Links](#)
- [Mail lists / chat](#)
- [More news](#)
- [Webmasters](#)
- [Web images](#)
- [Documentation \(wiki\)](#)
- [Frequently asked questions](#)

Developers

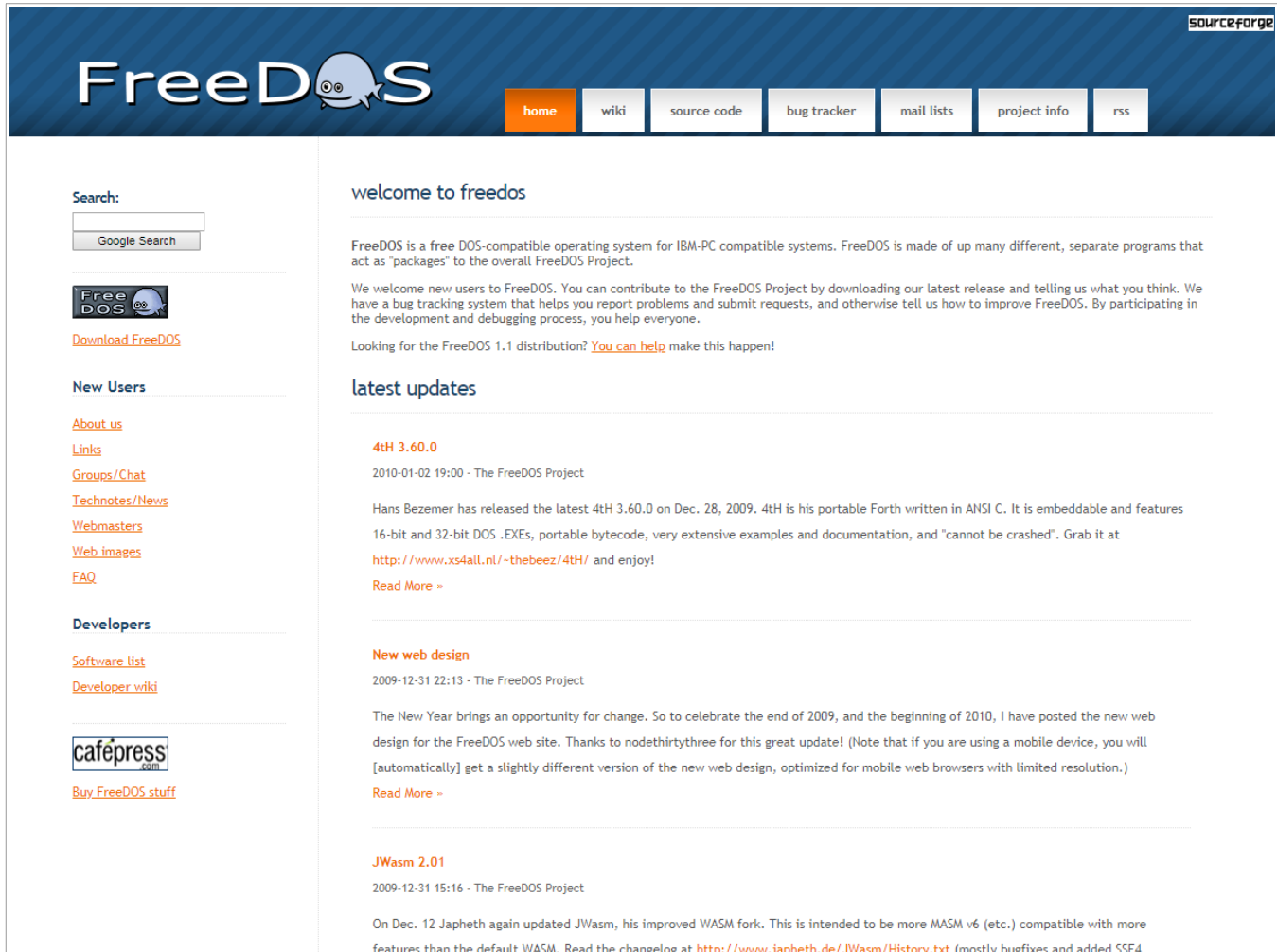
- [Report bugs](#)
- [Software list](#)
- [Developer wiki](#)
- [Kernel & FreeCOM](#)
- [SourceForge project](#)
- [FreeDOS projects](#)
- [FreeDOS-32 project](#)

[Buy FreeDOS stuff](#)

2009–2012

In late 2009, I decided to ask for help in updating the FreeDOS website design. I wanted to make it easier to use. I posted a plea around October, and several months later I found myself in contact

with a web designer named nodethirtythree. They volunteered to contribute a design from their website catalog, and on January 1, 2010, we refreshed the FreeDOS website with the new design. This update included a new white wordmark logo with the same FreeDOS fish from our boxed wordmark logo and wordmark in white with a black drop-shadow.



We've used variations on this design ever since. While the website's code may have changed under the hood, the outward appearance has remained mostly intact. The link buttons from the banner changed, but the blue striped background remained as part of our new web brand.

2012–2016

This version of the website remained for several years. Eventually, I wanted to arrange information on the website to attract new users and make information easier to find. Over several months in Spring 2012, I experimented with how to arrange information that was easiest for users


to digest. On June 3, 2012, I finally put up the new website. The new design included a FreeDOS screenshot, updated sub-pages with improved cross-linking to information, and quick answer links to help new visitors learn about FreeDOS.

Those quick answer links seemed like a clever idea at the time, but not everyone liked them. They used JavaScript to only show one answer at a time. This was a little weird to some folks, so we eventually removed this in favor of more straightforward navigation.

2016–present

When we released the FreeDOS 1.2 distribution on December 25, 2016, we marked the occasion with an updated website, providing a cleaner look and new fonts. This new design also added separate descriptions with brief descriptions of how people use FreeDOS, which hadn't really changed since 2006: classic games, legacy software, and embedded systems.

This new website design is the same one we use today. This version is based around HTML5 and uses a clean presentation that incorporates more screenshots on the front page. A major change in the new website is the shift towards SVG for the images, such as the FreeDOS logo and the icons. While we've used a responsive web design for years, using SVG allows for cleaner scaling of images on different displays.



Search

[Wiki](#) [Email Lists](#) [Bug Tracker](#) [Source Code](#) [Links](#) [History](#)

> HOME

Welcome to FreeDOS

FreeDOS is a complete, free, DOS-compatible operating system that you can use to play classic DOS games, run legacy business software, or develop embedded systems. Any program that works on MS-DOS should also run on FreeDOS.


It doesn't cost anything to download and use FreeDOS. You can also share FreeDOS for others to enjoy! And you can view and edit our source code, because all FreeDOS programs are distributed under the GNU General Public License or a similar open source software license.

[Learn more »](#)

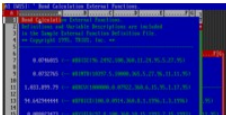
[What's included? »](#)

[Download FreeDOS 1.2 »](#)


Classic games



Legacy software



Embedded systems



I'm not planning further changes to the website. But then again, I think I've said that after every major website update. Based on past experience, we'll likely make tweaks and small adjustments to the website design, but no major changes for a few years.

FreeDOS Quick Reference

FreeDOS Commands

Looking for a quick-reference guide to using FreeDOS? This cheat sheet covers the most common commands.

What do you want to do?	How to do it on FreeDOS:	Similar command on Linux:
List directory contents	<code>DIR</code>	<code>ls</code>
- in the directory "above"	<code>DIR ..</code>	<code>ls ..</code>
- in a different directory	<code>DIR C:\FDOS\BIN</code>	<code>ls /usr/bin</code>
Change the current drive	<code>D:</code>	
Change the current directory	<code>CD \FDOS\BIN</code>	<code>cd /usr/bin</code>
- "up" one directory	<code>CD ..</code>	<code>cd ..</code>
Display the contents of a file	<code>TYPE FILE.TXT</code>	<code>cat file.txt</code>
- one screen at a time	<code>MORE FILE.TXT</code>	<code>less file.txt</code>
Copy a file	<code>COPY FILE.TXT NEW.TXT</code>	<code>cp file.txt new.txt</code>
Delete a file	<code>DEL FILE.TXT</code>	<code>rm file.txt</code>

Copy a directory and its contents	<code>XCOPY DIR NEWDIR</code>	<code>cp -r dir newdir</code>
Delete a directory and its contents	<code>DELTREE MYFILES</code>	<code>rm -rf myfiles</code>
Create a new directory	<code>MKDIR NEWDIR</code>	<code>mkdir newdir</code>
Remove an empty directory	<code>RMDIR MYFILES</code>	<code>rmdir myfiles</code>
Rename a file or directory	<code>REN FILE.TXT FILE.OLD</code>	<code>mv file.txt file.old</code>
Show all lines that contain "Hello"	<code>FIND "Hello" FILE.TXT</code>	<code>grep "Hello" file.txt</code>
- without regard to case	<code>FIND /I "Hello" FILE.TXT</code>	<code>grep -i "Hello" file.txt</code>
Clear the screen	<code>CLS</code>	<code>clear</code>
Edit a text file	<code>EDIT FILE.TXT</code>	<code>vi file.txt</code>
View and set the system date	<code>DATE</code>	<code>date</code>
View and set the system time	<code>TIME</code>	<code>date</code>
Show the usage for a program	<code>DIR /?</code> (for most programs)	<code>ls --help</code>
Get more help	<code>HELP</code>	<code>info</code>
Show the command history	<code>HISTORY</code>	<code>history</code>
Show the DOS version	<code>VER</code>	<code>uname</code>

A few things to remember:

Notes:	For example:
DOS commands can be upper or lowercase	<code>DIR</code> is the same as <code>dir</code>
Pipes (<code> </code>) are the same on DOS as on Linux	<code>TYPE FILE.TXT MORE</code>
Output redirection (<code>></code>) is the same too	<code>FIND "X" FILE.TXT > X.TXT</code>
<code>.</code> and <code>..</code> are the same on DOS as on Linux	<code>CD ..</code> moves "up" one directory

The directory separator is \

C:\ or C:\FDOS or C:\FDOS\BIN

File names can only be 8.3 characters

FILENAME.TXT

DOS uses letters for each drive

C: is the first hard drive

A full path is a drive letter and directory

C:\ or C:\FDOS or D:\GAMES

Batch Programming

Here's a helpful guide to batch programming under FreeDOS. Remember to reference normal batch script variables by enclosing the variable name with %, such as %PATH%.

What do you want to do?	How to do it in a batch script:
Execute another batch script from within a script	<code>CALL SCRIPT.BAT</code>
Run a command for each file in a list	<code>FOR %%F IN (*.TXT) DO EDIT %%F</code> or at the command line: <code>FOR %F IN (*.TXT) DO EDIT %F</code> The loop variable name can only be one character.
Print output	<code>ECHO Hello world</code>
Jump to a label in a batch file	<code>:LOOP</code> <code>GOTO LOOP</code>
Test the value of a string	<code>IF %VAR%==1 ECHO One</code>
Test if a file exists	<code>IF EXIST TEMP.DAT DEL TEMP.DAT</code>
Test the return value of the previous command	<code>IF ERRORLEVEL 0 ECHO Success</code>

Test the opposite of something

```
IF NOT ERRORLEVEL 0 ECHO Fail
```

A comment in a batch script

```
REM This is a comment
```

Set a variable

```
SET TEMPFILE=TEMP.DAT
```

Set the shell's search path for programs
(Use `;` to separate paths)

```
PATH C:\FDOS\BIN;C:\MY\BIN
```

or to reference the existing path:

```
PATH %PATH%;C:\MY\BIN
```

Shift the command line options to a batch script
(Reference options as `%1`, `%2`, and so on)

```
SHIFT or SHIFT 1 or SHIFT 2 or any n
```

```
SHIFT with no n is the same as SHIFT 1
```

Thank You

When I created the FreeDOS Project in 1994, we aimed to create a free DOS that could replace the proprietary MS-DOS. Together, we not only met that goal, but exceeded it. FreeDOS includes many modern features not found in MS-DOS, or features that are significantly improved from MS-DOS.

I want to thank everyone who has helped make FreeDOS what it is today. From our meager beginning with just a few basic utilities, developers from around the world have come together to contribute code patches and new features to FreeDOS.

And there's still more to come! As we look forward to the next version of FreeDOS, we want to create a modern DOS. That will be a fine balance. We can add things and change some other things, but in the end FreeDOS must remain "DOS." FreeDOS will always be the classic 16-bit operating system that runs legacy MS-DOS programs, but we want FreeDOS to be more than just an "also ran." We aren't sure what the next version will look like—at least, not exactly—but I encourage everyone who reads this to join the conversation on the FreeDOS email lists, and help us shape the future of FreeDOS.

—Jim Hall