

Filed on behalf of:

Patent Owner SightSound Technologies, LLC

By: David R. Marsh, Ph.D.
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,

Petitioner,

v.

SIGHTSOUND TECHNOLOGIES, LLC,

Patent Owner.

Case CBM2013-00023

Patent 5,966,440

**UNOPPOSED MOTION TO EXPUNGE AND
FILE CORRECTED EXHIBITS**

Mail Stop PATENT BOARD
Patent Trial and Appeal Board
U.S. Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

I. Statement of the Precise Relief Requested

Pursuant to 37 C.F.R. § 42.22(a)(1) and for the reasons set forth below, Patent Owner SightSound Technologies, LLC (“Patent Owner”) respectfully requests that the Board: (1) expunge Exhibits 2310, 2317, and 2347 from the record; and (2) file in their place corrected Exhibits 2310, 2317, and 2347.

II. Statement of Material Facts

1. Patent Owner filed its Response to the Petition and related Exhibits on January 3, 2014.

2. On March 4, 2014, Patent Owner noticed that Exhibits 2310, 2317, and 2347, as filed with the Response to the Petition, contained small portions of illegible and omitted text.

3. On March 5, 2014, Patent Owner alerted Counsel for Petitioner Apple Inc. (“Counsel for Petitioner”) that some Exhibits may contain illegible and omitted text. Subsequently, Counsel for Petitioner agreed not to oppose the present Motion.

4. On March 14, 2014, Patent Owner emailed the Board requesting authorization to file this Unopposed Motion to Expunge and File Corrected Exhibits.

5. On March 14, 2014, the Board authorized such a filing in an email to myself, David R. Marsh, lead counsel for Patent Owner.

6. Patent Owner submits herewith, as attachments to the present Motion, corrected versions of Exhibits 2310, 2317, and 2347, which may be filed into the record should the Board grant the present Motion.

III. Statement of the Reasons for the Relief Requested

Patent Owner files the present Motion in accordance with the Board's authorization on March 14, 2014. The corrected Exhibits serve to clarify and complete the record before the Board and do not introduce new material into the proceeding. For the foregoing reasons, Patent Owner respectfully requests that the Board: (1) expunge Exhibits 2310, 2317, and 2347 from the record; and (2) file in their place corrected Exhibits 2310, 2317, and 2347.

Dated: March 19, 2014

Respectfully submitted,

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*Attorneys for Patent Owner
SightSound Technologies, LLC*

CERTIFICATE OF SERVICE

The undersigned certifies that a copy of the UNOPPOSED MOTION TO EXPUNGE AND FILE CORRECTED EXHIBITS, including the attached corrected Exhibits 2310, 2317, and 2347, was served on March 19, 2014 to the following Counsel for Petitioner via e-mail, pursuant to the parties' agreement concerning service:

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CORRECTED EXHIBIT 2310

Filed on behalf of:

Patent Owner Sightsound

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE, INC.,

Petitioner,

v.

Patent of SIGHTSOUND TECHNOLOGIES, LLC,

Patent Owner.

Case CBM2013-00023
Patent 5,966,440

**DECLARATION OF SCOTT SANDER IN SUPPORT OF PATENT
OWNER SIGHTSOUND TECHNOLOGIES, LLC'S RESPONSE PETITION**

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Patent Trial and Appeal Board
U.S. Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

I, Scott Sander, hereby declare as follows:

1. I am a member of the managing board of SightSound Technologies, LLC ("SightSound"). I provide this Declaration in support of SightSound's Responses to Apple Inc.'s Petitions for Covered Business Method Patent Review of United States Patent Nos. 5,919,573 ("the '573 Patent") and 5,966,440 ("the '440 Patent") (collectively "the Patents"). I am over the age of eighteen, have personal knowledge of the facts set forth below unless otherwise stated, and if called to testify as a witness in this matter, I could and would testify competently thereto.

2. In 1995, together with Arthur Hair (the inventor of the Patents) I founded Parsec Sight/Sound, Inc. and Digital Sight/Sound, Inc., SightSound's predecessors in interest, to commercialize Mr. Hair's invention. Mr. Hair assigned all of his ownership rights in the '573 Patent, and every subsequent patent to issue from that same disclosure, to SightSound. Shortly after obtaining the '573 Patent, Mr. Hair wrote to John Sculley, the then-Chairman of the Board and CEO of Apple, informing him of the '573 Patent, which Mr. Hair stated would "revolutionize the video rental industry and prerecorded music industry, among others, and will serve as a catalyst to propel the multimedia industry into the 21st century." Attached as

exhibit 2311 is a true and correct copy of Mr. Hair's April 5, 1993 letter to Mr. Sculley. Page numbers and an exhibit label have been added to this document but no other alterations have been made.

3. In the late 1990s and early 2000s, SightSound developed an online commercial system for the sale of digital music and video files which was found at SightSound.com.

4. In 1995, SightSound became the first company to offer digital downloads of music through electronic sale over the Internet, when it offered the album (as well as individual songs) from the band The Gathering Field's debut album "The Gathering Field." Attached as exhibit 2312 is a true and correct copy of a screen shot from the SightSound.com website in 1995 offering the Gathering Field album for sale for \$6.00, as well as offering individual songs from the album for sale for \$1.00. Page numbers and an exhibit label have been added to this document but no other alterations have been made. SightSound.com offered free 30 second previews of the music being offered for sale. *Id.* ("Free Sample: 5.4 MB: 30 second clip"). SightSound.com also showed the cover art for music being offered for sale and provided reviews and press coverage regarding the album as shown in exhibit 2312.

5. Shortly after SightSound began offering The Gathering Field's album for sale, SightSound temporarily ceased selling music on its website due to

guidance I received from noted venture capitalist, L. John Doerr, who warned that selling the music of independent artists directly to consumers in this new way would be perceived by the major record labels as a threat to their current business model. I believe the music labels were not ready to adopt such a radical change in the mid to late 1990s, as the new model would have required them to migrate away from production of physical media (such as CDs) and transition to digital formats, as well as sell individual songs instead of entire albums which I understood they believed would be less profitable. I also understood that the music labels were reluctant to embrace the new model as they were concerned about unauthorized copying of their content. For these reasons, I understood that content holders were reluctant to license their content to SightSound for sale over the Internet.

6. SightSound.com initially offered individual songs for sale for \$1.00. By 1998, however, Sightsound began offering songs for \$0.99. The SightSound.com website presented a menu of music to select for purchase by showing the cover art of particular albums in a table format. Attached as exhibit 2313 hereto is a true and correct copy of a screen shot from SightSound.com from 1998-1999 reflecting music for sale at SightSound.com. Page numbers and an exhibit label have been added to this document but no other alterations have been made. In 1999, SightSound offered the first sale of a movie over the Internet (Darren Aronofsky's movie "Pi").

7. SightSound.com received press and media coverage praising the innovative new method for selling digital content. Accurate information about the history of SightSound, the website and press coverage regarding the company and website can still be found at <http://www.sightsound.com/>. Some specific press articles and television coverage about Mr. Hair's invention and SightSound.com are under the drop down menu "In the News." As just a few examples of the press coverage SightSound received, attached as exhibit 2314 is a true and correct copy of a November 1998 article from the Pittsburgh Business Times entitled "Internet Firm Pioneers Downloadable Music Sales." Page numbers and an exhibit label have been added to this document, and text has been organized to fit on an 8 1/2" x 11" page, but no other alterations have been made. Further, the September 6, 1999 issue of Time magazine featured SightSound.com in an article entitled "Movies Hit the Net." Attached as exhibit 2315 is a true and correct copy of the September 1999 article. Page numbers and an exhibit label have been added to this document but no other alterations have been made. Further, in January 2000, Yahoo Internet Life magazine featured SightSound.com as the lead story in its article on the 100 best sites for 2000. Attached as exhibit 2316 is a true and correct copy of the January 2000 Yahoo Internet Life magazine article. Page numbers and an exhibit label have been added to this document but no other alterations have been made.

8. On January 15, 1999, I wrote to Steve Jobs, the then-Chairman and CEO of Apple, informing him of the business of SightSound.com and the potential for Apple to participate with SightSound in the business of selling digital content over the Internet. I informed Mr. Jobs that "we believe that the download sale of movies and music will become the consumers' method of choice," and further, that the Mac OS (operating system) required specific functionality to support the download sales of music and movies. I also suggested that there could be an opportunity for Apple to participate in the "manufacture of an open platform audio player." I further attached a graphical schematic detailing how the SightSound.com servers stored content, permitted the downloaded content to be received by the consumer, and could be used on a handheld device that SightSound suggested that Apple develop. Attached as exhibit 2317 is a true and correct copy of my January 15, 1999 letter to Mr. Jobs with the attached schematic. Page numbers and an exhibit label have been added to this document but no other alterations have been made.

9. On or around February 3, 1999, SightSound was contacted by Apple with a proposal to discuss the potential business described in my January 15, 1999 letter. The letter from Apple requested that a meeting take place on a non-confidential and non-obligation basis and asked SightSound to confirm that understanding. With full confidence in the protection afforded SightSound by

virtue of our patents, I accepted Mr. Cefalo's "non-confidential and without obligation" standard for the proposed meeting. Attached as exhibit 2318 is a true and correct copy of the February 3, 1999 letter from Mr. Albert P. Cefalo on behalf of Apple to me. Page numbers and an exhibit label have been added to this document but no other alterations have been made.

10. On or around February 26, 1999, Mr. Hair and I met with Mark Gavini and Tom Weyer from Apple in Los Angeles. I understood that Mr. Weyer was an Apple engineer and that Mr. Gavini was Partnership Manager of Worldwide Developer Relations. During that meeting, Mr. Hair and I explained our patents, expressed our belief in the superiority of our download purchase model versus streaming subscription services, and made several requests of Apple, notably that they manufacture a hand held portable player, and re-architect their operating system. We discussed in more detail the written schematic previously provided to Steve Jobs. We requested enhancements to Apple's operating system to bolster digital rights management (DRM) capabilities—specifically encryption—to permit the sale of digital audio and video for download on Mac computers. After a lengthy discussion, I recall Messrs. Gavini and Weyer concluding that it would take an entire re-write of the Mac operating system to adequately support the level of encryption that would be needed to satisfy the media and entertainment industry.

Messrs. Gavini and Weyer indicated that SightSound should not expect such a re-write of the Mac operating system anytime soon.

11. In May 2001, SightSound was the first company to electronically sell a movie into a handheld pocket personal computer; the movie "Quantum Project" was sold into the iPAQ, which was sold by Compaq Computer Corporation. Attached as exhibit 2319 is a true and correct copy of a screen shot from SightSound.com from 2001 reflecting the Quantum Project for sale at SightSound.com. Page numbers and an exhibit label have been added to this document but no other alterations have been made.

12. SightSound continued to promote SightSound.com and the patented invention in the early 2000s. However, we were unable to successfully convince the major record labels that music and video distribution via a digital online download format was the future of the music industry and obtain licenses to sell their content. I believe that the record labels were resistant for the reasons mentioned above, and were slow to understand the market potential for online digital music and video sales. Without sufficient licenses for content to sell through SightSound.com, it was difficult to generate significant revenue from digital download sales.

13. In 2002, paradoxically, our Patents, the very things that enabled us to raise the capital to launch the download industry, now were draining us of cash,

given the heavy cost of defending against infringers. Further, content holders were largely unwilling to give us licenses to their content to sell through SightSound.com. I understood that content holders, particularly record labels, were unwilling for the reasons outlined above, but also because SightSound.com sold only to users of Microsoft's' operating system, which the record labels feared as a monopoly with its 96% market share, was of further concern to the record labels. In contrast, Apple's 4% share made it a far less threatening partner to the record labels, or so they thought, so they were willing to grant Apple licenses to their content. Time magazine confirmed my understanding on this point, stating that the record labels gave Apple a "sweet deal" because "Apple with its miniscule share of the computer market was never going to be a real distribution threat." Attached as exhibit 2320 is a true and correct copy of the November 17, 2003 Time magazine article "Invention of the Year." Page numbers and an exhibit label have been added to this document but no other alterations have been made.

14. In 2002, SightSound ceased its own commercial operations, as SightSound.com was unable to generate sufficient revenue to fund SightSound's expenses, including the costs associated with defending the Patents.

I declare under penalty of perjury that the foregoing is true and correct.

Sworn this 27th day of December, 2013 at Pittsburgh, Pennsylvania.



Scott Sander

CORRECTED EXHIBIT 2317

January 15, 1999



SIGHTSOUND.COM

VIA FEDERAL EXPRESS

Steven Jobs
Chairman & CEO
c/o Andrea Nordemann
Apple Computer, Inc.
1 Infinite Loop
Cupertino, California 95014-2084

Dear Mr. Jobs:

SIGHTSOUND.COM is a Download Service Provider ("DSP") to owners of audio and video recordings and we believe that the download sale of movies and music will become the consumers' method of choice. Currently, SIGHTSOUND.COM is selling music over the Internet in a compressed and encrypted format. We have identified specific functionality we believe would be beneficial to have added to the Mac OS. Additionally, we believe there is an opportunity for Apple to participate in the manufacture of an open platform audio player. Attached is a graphic detailing these finding.

I look forward to meeting with you to discuss Apple's possible involvement in providing such hardware and software. We are in such discussions with Microsoft and we believe it would be in the consumers' interest to include Apple Computer as well.

Sincerely,
SIGHTSOUND.COM

Scott C. Sander
President
Chief Executive Officer

Enclosure

SCS:mg

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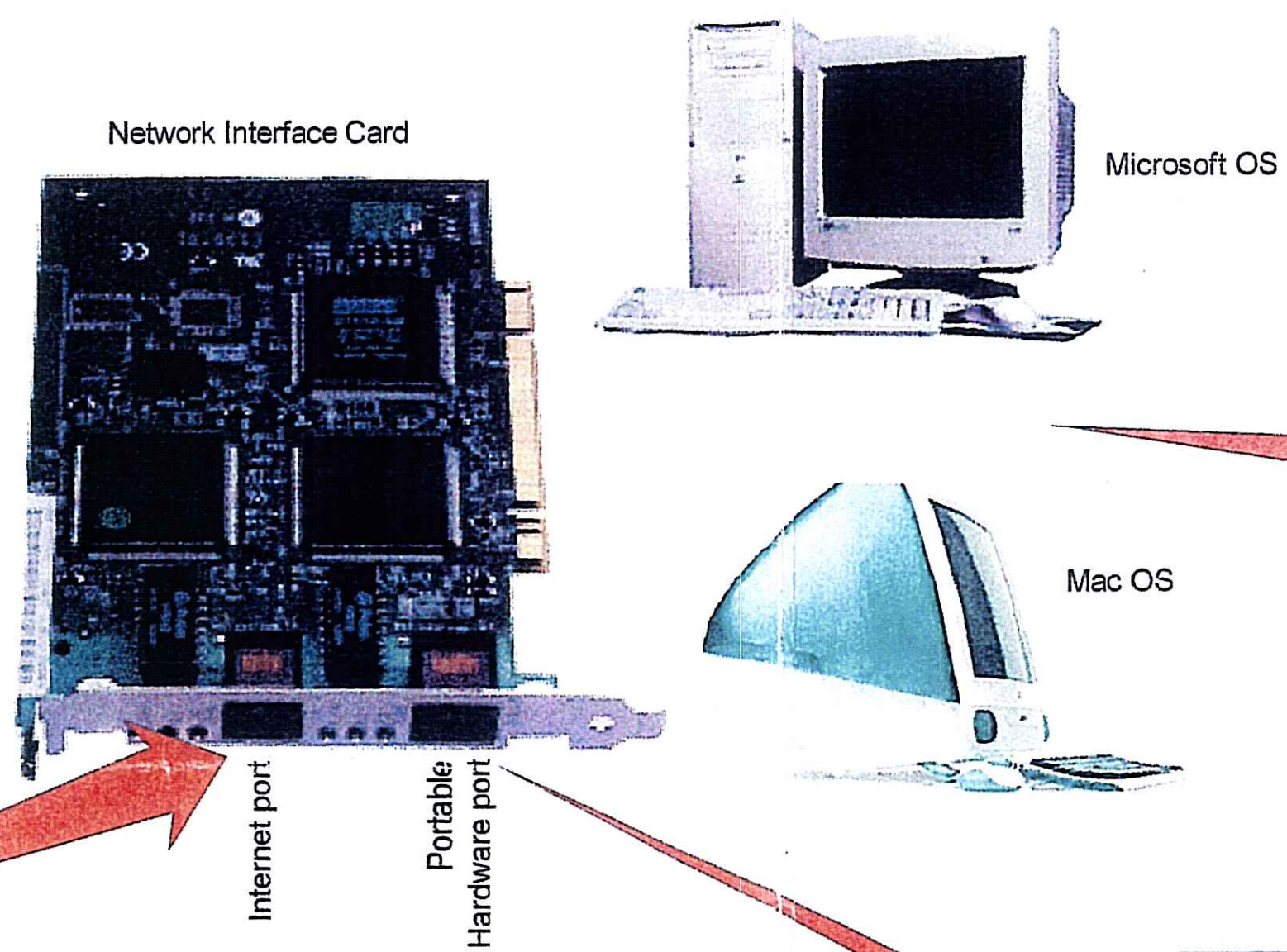
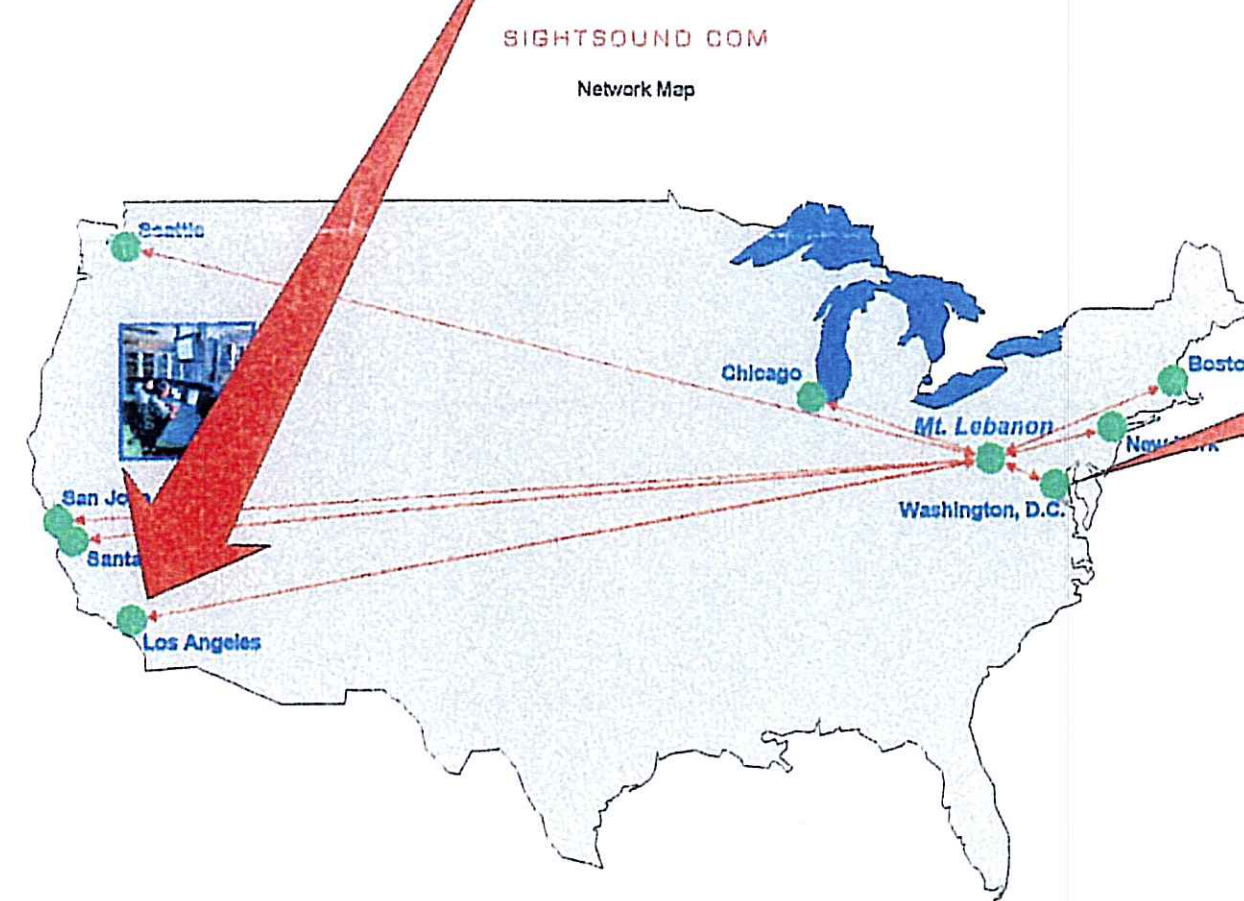
(412) 341-1001 voice
(412) 341-2442 fax
<http://www.sightsound.com>

SIGHTSOUND TECHNOLOGIES, LLC

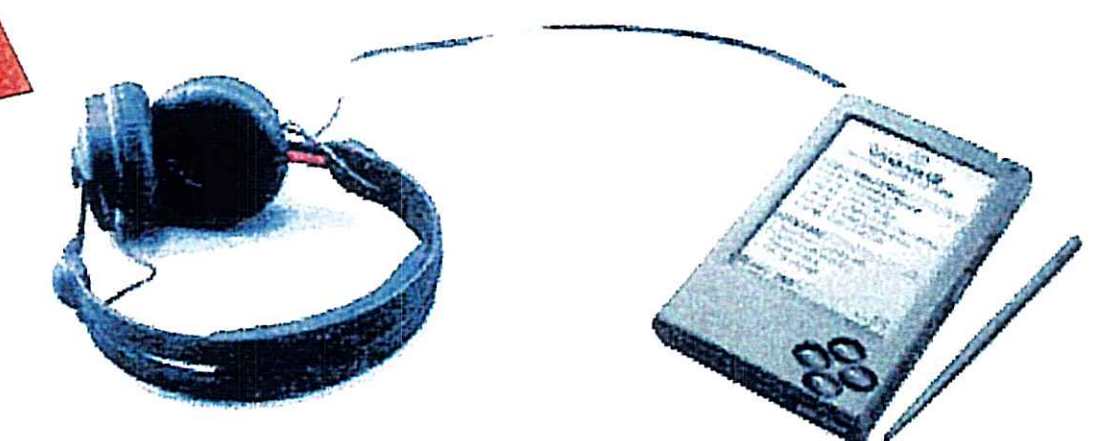
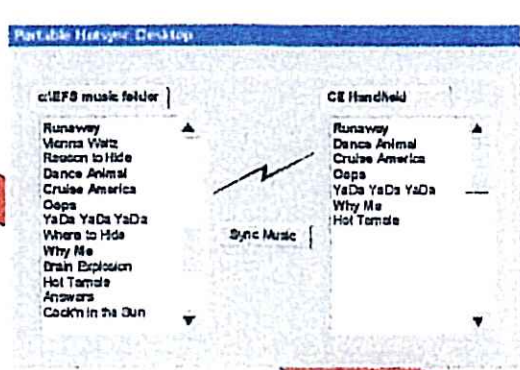
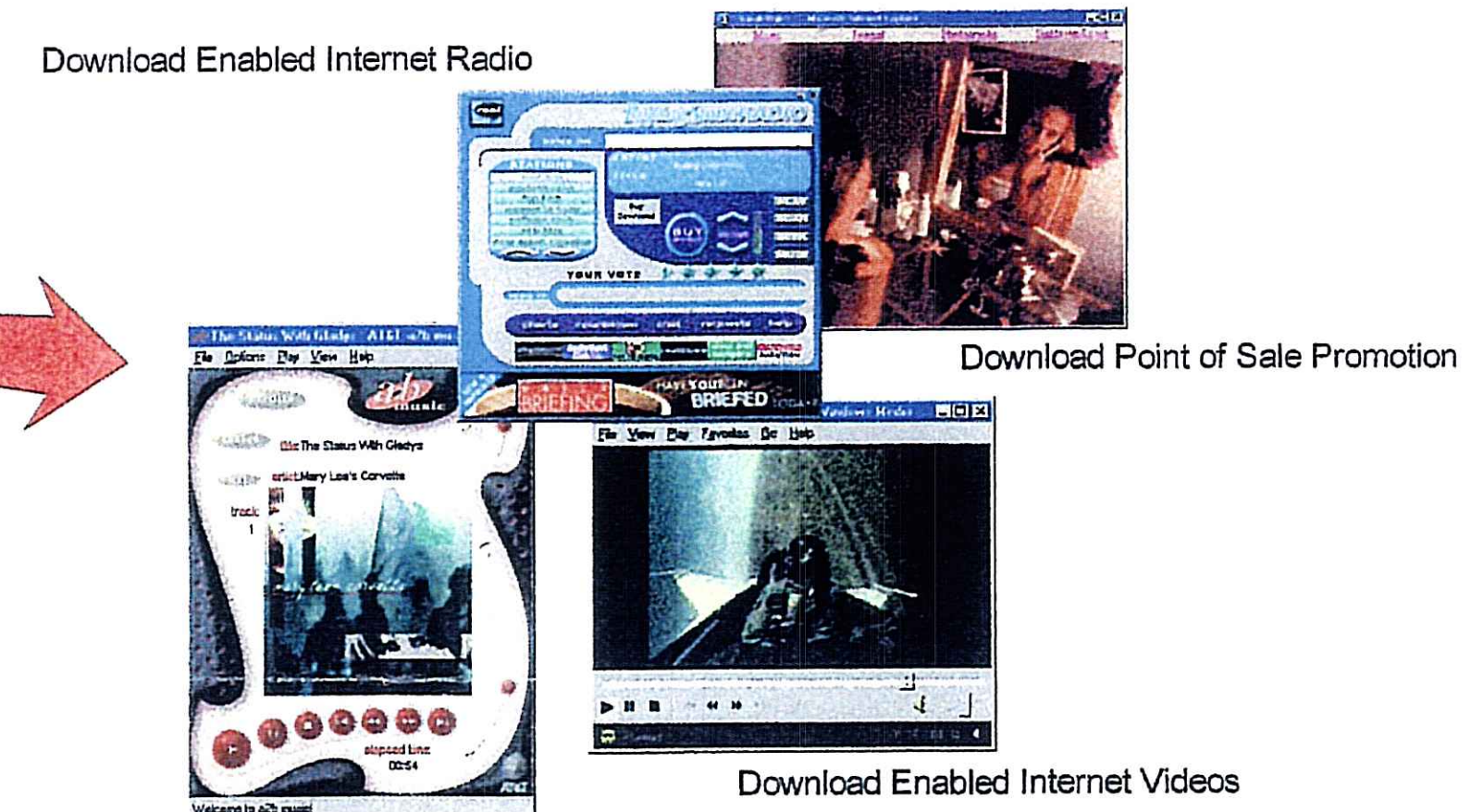
EXHIBIT 2317

CBM2013-00023 (APPLE INC. v. SIGHTSOUND TECHS., LLC)

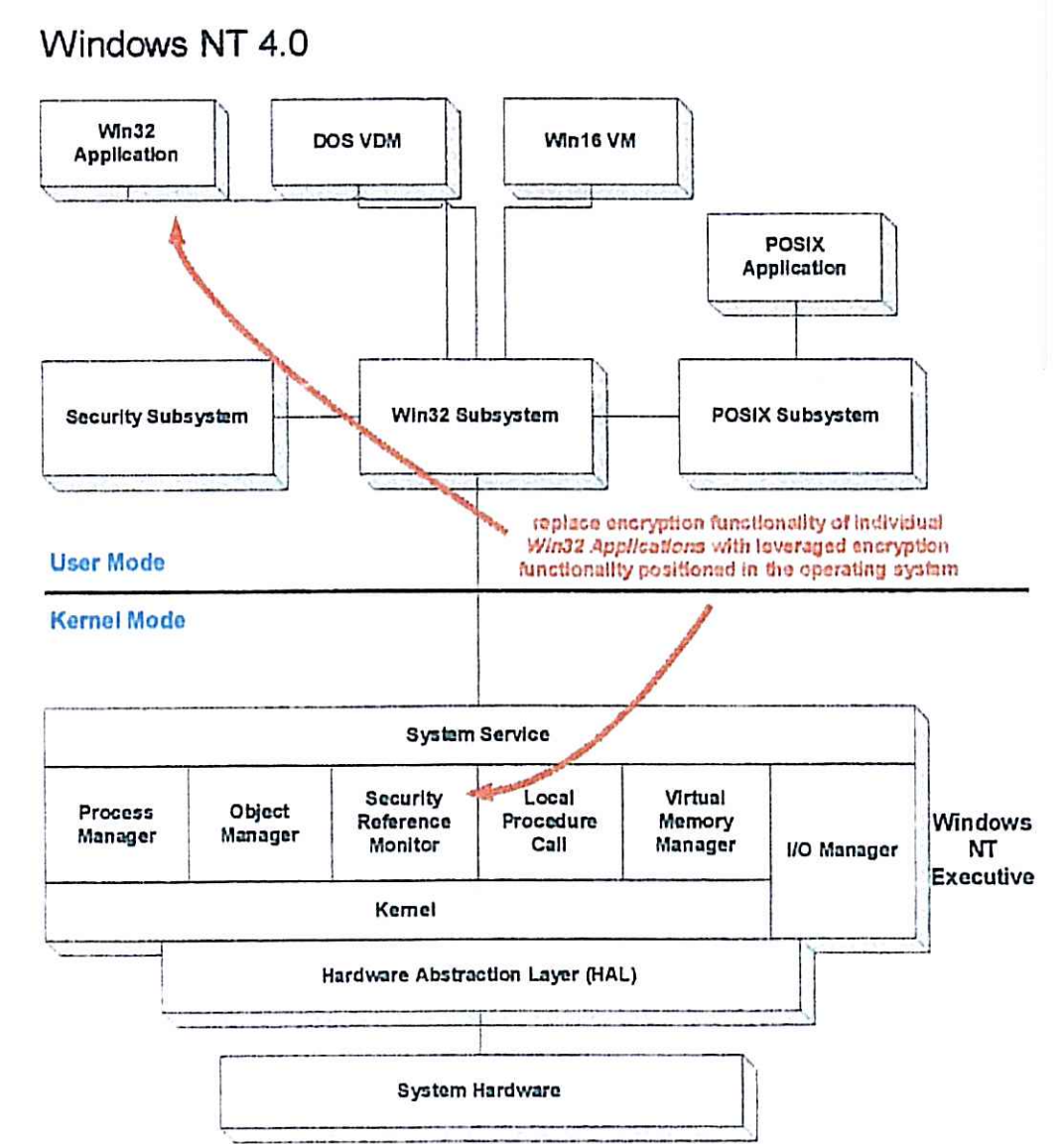
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SIGHTSOUND.COM



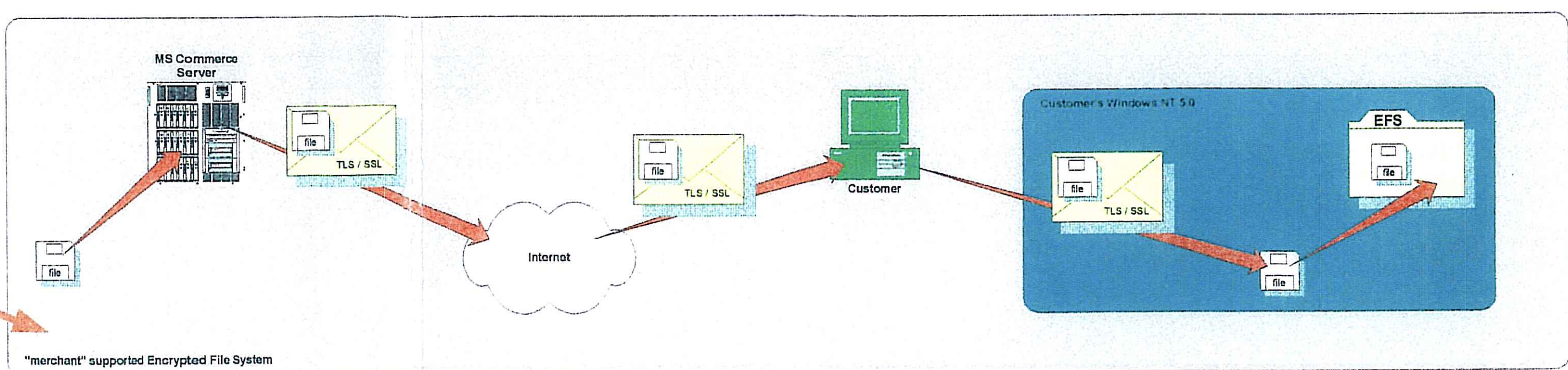
Windows CE / Apple Mac Handheld Audio/Video Player



Operating System Security Enhancements
 SIGHTSOUND.COM sells music (digital audio files) via the Internet in download fashion. Currently, a "one key fits all" security architecture does not exist for Internet users. Encryption/decryption currently takes place at the application level (i.e. Win32 Application), and once the music is decrypted, an unencrypted audio signal is sent by the application (i.e. the audio player) to the OS for playback through the sound card. If a consumer of encrypted audio files experiences a hard disk failure and must reinstall their audio player software, requiring a new encryption key, the new audio player will not be able to decrypt and playback their old library of purchased audio files which were encrypted with the lost key, even if they have backed up those audio files.

Microsoft has announced plans to include a Shared Public Key Infrastructure (Shared PKI) in the upcoming Windows NT 5.0 and permit application developers to take advantage of these new encryption features. SIGHTSOUND.COM believes that it would be to the benefit of both Microsoft and its customers if Microsoft provided a downloadable update for Windows CE, Win 95, Win 98, and Win NT 4.0 (if possible) to provide the same Shared PKI functionality, and that they be compatible with the Mac OS. SIGHTSOUND.COM also believes that it would be to the benefit of both Apple and its customers if Apple provided compatible Shared PKI functionality in their operating systems as well. SIGHTSOUND.COM believes that this "Shared Public Key" (Shared PK) will increase ease of use for the customer and increase on-line security for the audio/video files.

Additionally, Microsoft has announced plans to include an Encrypting File System (EFS) in the upcoming Windows NT 5.0, which supports transparent encryption and decryption of files stored on a disk. SIGHTSOUND.COM believes that it would be to the benefit of both Microsoft and its customers if Microsoft adds "merchant" functionality to the EFS and updates the Microsoft Commerce Server to provide an encrypted download link between a consumer's PC operated by Windows NT 5.0 and the merchant's Microsoft Commerce Server. Any file (i.e. WAV, AVI, MP4, EXE) could be sold and transmitted by the merchant's Microsoft Commerce Server, encrypted for Internet transmission (i.e. TLS or SSL) using the customer's Shared PK, decrypted by the customer's NT 5.0 using the Shared PK, re-encrypted by the customer's NT 5.0 using the updated EFS and using the customer's Shared PK, and saved to the customer's NTFS disk in encrypted format. Playback or opening of any file sold in this manner is only possible if the OS determines that its Shared PK matches the Shared PK used to initially encrypt the file. Additionally, SIGHTSOUND.COM believes that it would be to the benefit of both Microsoft and its customers if Microsoft adds "transparent" functionality to the EFS to enable the customer to pass along the EFS encrypted file without creating unauthorized duplicates. SIGHTSOUND.COM believes that it would be to the benefit of both Microsoft and its customers if Microsoft provided a downloadable update for Windows CE, Win 95, Win 98, and Win NT 4.0 (if possible) to provide the same EFS functionality, and that they be compatible with the Mac OS. SIGHTSOUND.COM also believes that it would be to the benefit of both Apple and its customers if Apple provided compatible EFS functionality in their operating systems as well. This would permit portability of EFS encrypted audio/video files from one PC or Mac to another, including portables running Windows CE.



CORRECTED EXHIBIT 2347



How iTunes Works

by Julia Layton and Jonathan Strickland

Browse the article [How iTunes Works](#)



Internet Connection Image Gallery The iTunes store has a slick interface and a huge library of media and applications. See options for getting online with Internet connection pictures. Screenshot by HowStuffWorks.com

TOOLS FOR LISTENING

- [MP3 Quiz](#)
- [HowStuffWorks Podcasts](#)
- [Discovery.com: Discovery Channel Podcasts](#)

Introduction to How iTunes Works

Remember when Microsoft was the bad guy and Apple was the underdog? Funny how a brilliant idea can change everything. With the raging success of the iPhone, the iPod line of products and iTunes, you'll now find almost as many people ranting about Apple as about Microsoft. Where one person sees the coolest combination to hit electronics since TiVo met the TV, another sees plans for world domination. And it's all about one word: control.

In this article, we'll see what makes iTunes the most popular jukebox software in the world, review some of its more advanced functions, explore the integrated iTunes Store and find out why the whole setup has inspired some lawsuits and epic hacking wars. First, let's cover the basics.

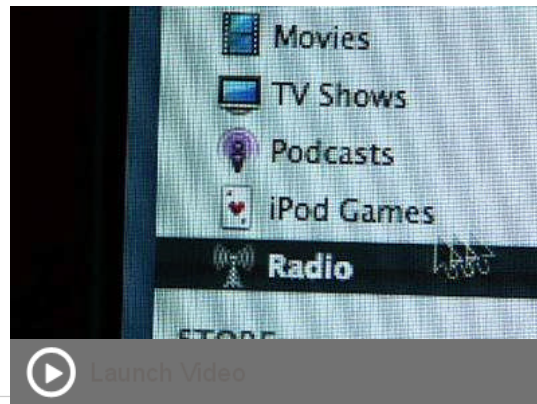
iTunes is a piece of software that lets you add to, organize and play your digital media collection on your computer, as well as sync it to a portable device. It's a jukebox player along the lines of Songbird and Windows Media Player, and you can use it on a Mac or Windows machine. The most significant difference between iTunes and some other media players is the built-in iTunes Store (where you can get podcasts; iPhone, iPad and iPod touch apps; music videos; movies; audiobooks and TV shows, too) and its multi-level integration with Apple's iPhone and its iPod portable media player.

But a portable media player isn't the only way to enjoy iTunes content. There's your Mac OS X or Windows computer, first off -- if you've got a sound card and a set of speakers (and you probably do), that's all you need to use iTunes. There's also Apple's popular entry into the smartphone market, the iPhone. Or you can play your iTunes library with one of the few phones Apple authorized

to access the service, such as the Motorola ROKR E1 phone. Some enterprising hackers have created apps that let you synchronize non-Apple products with iTunes, but these aren't supported by Apple and may not work with every version of iTunes. Apple's wireless networking hub, AirPort Express, lets you wirelessly stream iTunes music from your computer to your hub-connected home-theater speakers. With this setup, you control playback via your computer, iPhone, iPad or iPod touch.

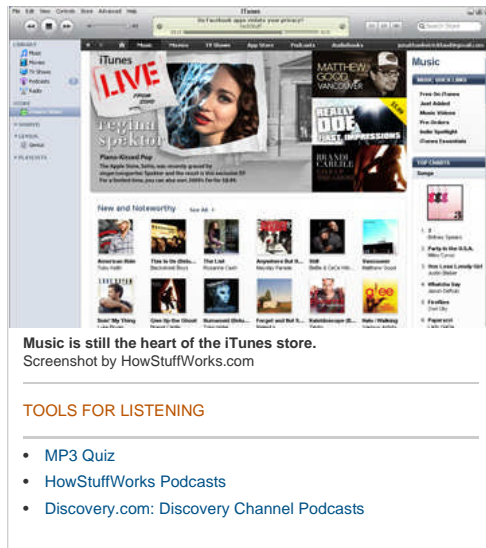
With another iTunes stream receiver, Roku's SoundBridge Network Music Player, you control everything through the SoundBridge remote control. So you're not limited to any single option when it comes to playback. But you may be limited by the type of player you have and the capabilities of your computer system. You may also have some difficulty tracking down one of these devices; Roku no longer sells the units [source: Roku]

Next, learn about iTunes compatibility with your computer and MP3 player.



iTunes Compatibility

iTunes compatibility in the realm of portable players is a bit of a quagmire, which is part of the reason why some people just avoid iTunes entirely. You can use the iTunes Mac software with, say, a Creative Nomad MP3 player (see iTunes for Mac OS X: Compatible Players for a complete list). But iTunes for Windows only supports the iPhone, iPad or iPod series -- if you connect a Creative Nomad to a Windows machine running iTunes, the software won't see it. And there's no version of iTunes for Linux machines, either. But there are ways around that -- just do a Google search for



"iPod Linux hacks." What's more, Apple is no longer updating the compatible players list, which may suggest iTunes won't support new non-Apple players moving forward.

Since the introduction of the **iPhone**, Apple no longer provides iTunes support to new phones from other manufacturers. Apple's strategy is to convince consumers to purchase Apple products and use them with Apple services. The company doesn't make it easy for you to use iTunes with any non-Apple device. Some companies, such as Palm, tried to get around Apple's closed system only to be shut down in subsequent iTunes updates.

So iTunes (or at least the Mac version) does support other players besides the iPod. But here it gets even trickier: Older music you downloaded from the iTunes Store is protected by the Apple FairPlay **digital rights management** (DRM) format, which is a proprietary, protected AAC file format that Apple doesn't license to anybody. The only devices that can play those files are ones with the ability to decrypt the Apple DRM, which includes your computer running iTunes, an iPod, an iPad, an iPhone, an iTunes phone and your speakers connected to AirPort Express. (You can't play them on Roku's SoundBridge, because Apple licensed Roku the iTunes software minus the DRM decryption.)

To play iTunes Store files with DRM on a portable player besides an iPod, you have to first burn them to a **CD** or **DVD** as **MP3 files**. The DRM encoding doesn't make it to the disc. You then rip the now-unprotected files back into your iTunes library and download them to the player. Alternatively, you can repurchase songs at a reduced price to get the version without Fairplay. Songs purchased from the iTunes Store in the iTunes Plus format don't carry DRM, which means you won't have to go

through this step.

So now we know which devices will and won't work with the iTunes software. Next, we'll find out what you can do with the software if you've got the right hardware (or the wrong hardware with the right hack).

SYSTEM REQUIREMENTS

Mac

Mac OS X v10.5 or later

1 GHz or faster processor (G4 Mac or better)

QuickTime 7.6.4 or later

1 GB RAM to play HD video

16 MB of video RAM for HD video

200 MB of disk space

Broadband Internet (to use iTunesStore)

Windows

Windows XP service pack 2 or later

200 MB of disk space

2 GHz Intel Core 2 Duo or faster processor to play HD video, iTunes LP or iTunes Extras

DirectX 9.0-compatible video card with at least 32 MB of video RAM

Screen resolution of 1024 x 768 or greater

QuickTime-compatible audio card

1 GB of RAM to play HD video, iTunes LP or iTunes Extras

Broadband Internet (to use iTunes Store)

WHAT'S A PODCAST?

A podcast is an audio (or sometimes video) broadcast that you can download via the Internet and subscribe to so your computer automatically downloads all new episodes served up by that podcaster. You can listen to it on your computer or download it to a portable media player. Lots of podcasts are homemade, put together on a **home PC** and loaded up to a server for distribution. Many **bloggers** now produce their own podcasts. Some podcasts are professional-grade recordings put out by organizations like HowStuffWorks.com,

iTunes Software

Even if you never make a single purchase from the iTunes Store, you can still take advantage of the basic functions of iTunes. iTunes offers all of the features we've come to expect from a high-level jukebox media player:

- **Audio-file playback:** iTunes supports AAC, AIFF, Apple Lossless, MP3, WAV, Audible.com's .aa format and unprotected WMA audio formats.
- **Streaming music:** You can open a stream in iTunes just by entering the URL in the "Open Stream" dialog box.

Discovery Channel, NPR, PBS and The Onion. See [How Podcasting Works](#) to learn more.

You can subscribe to a podcast directly through iTunes. Just click "Subscribe to Podcast" and type the podcast's URL in the dialog box that pops up. You'll automatically receive all new podcasts from that broadcaster.

TOOLS FOR LISTENING

- [MP3 Quiz](#)
- [HowStuffWorks Podcasts](#)
- [Discovery.com: Discovery Channel Podcasts](#)

- **Sharing music over a network**

NETWORK PROTOCOL

iTunes uses Apple's proprietary Digital Audio Access Protocol (DAAP) to transfer shared music between devices on a network. That means any other computer on the network can only access the shared music through iTunes -- unless you build yourself a DAAP server. See [OpenDAAP](#) to learn more. The iTunes 10 update reportedly interfered with third-party devices working with the service [source: [Foskett](#)].

TOOLS FOR LISTENING

- [MP3 Quiz](#)
- [HowStuffWorks Podcasts](#)
- [Discovery.com: Discovery Channel Podcasts](#)

- **Internet radio:** You can set [Internet radio](#) presets.
- **Graphics:** You can view audio-coordinated graphics on-screen and print jewel-case art for your burned CDs.
- **CD track information:** iTunes automatically displays all available CD information when you insert a disc into the [drive](#). You can also edit the information if it's incomplete or wrong.
- **Organization and management tools:** iTunes offers automatic and manual management options for your library.
- **File-type conversion:** iTunes will convert your AAC, AIFF, Apple Lossless, MP3, WAV or unprotected WMA files to AAC, AIFF, Apple Lossless, MP3 or WAV format.
- **Playlist creation**
- **Burning and ripping CDs**
- **Downloading files to a portable player**

Advanced Features in iTunes

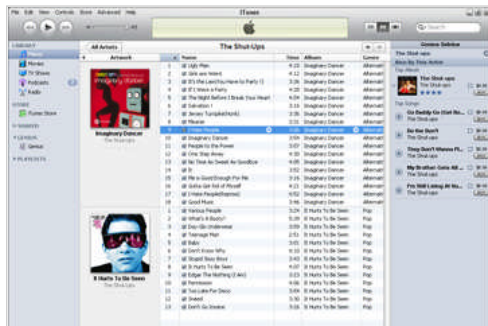
In addition to the typical jukebox functions, iTunes offers some nice advanced features:

- **Ping:** The newest major feature in iTunes is Ping, Apple's attempt at inserting a social networking [element](#) into iTunes. With Ping, you can follow your favorite artists and see what music they like or get the early word on albums, releases and concerts. Your friends can follow you and learn more about the music you enjoy. Apple includes links to make it easier to purchase music you discover.
- **Autosyncing:** iTunes will not only detect an iPod, iPhone or iPad, but will also automatically download all content you added to iTunes since the last sync (you can set it to manual mode if you don't want iTunes to transfer everything). Your iPod will also upload to iTunes any new song ratings or playlists you created directly on your iPod (but not any songs you added -- if there's a song on your iPod that isn't in your iTunes library, say goodbye to it when you autosync). The problem with autosync is that it syncs blindly -- if, for instance, you clear out your iTunes library for some reason, and you then connect your iPod to your computer, the autosync will wipe everything off your iPod to make it look just like your iTunes library. To avoid this, just turn off autosync.
- **Smart Playlists:** You can set parameters for iTunes to create a playlist for you using songs from your library.

Parameters can be the song's genre, date of release or rating. When you add a new song to iTunes that matches your Smart Playlist parameters, the software will automatically add it to the playlist.

- **Genius:** One of the more recent features in iTunes is the Genius function. Genius assembles playlists for you -- just pick a song and Genius will build a playlist around it. Ideally, the songs should all complement each other. It will also recommend songs and apps for you to purchase to build out your library.
- **Home Sharing:** If you have several computers in your household, you may have several music libraries. The Home Sharing feature lets you share music across multiple computers on your home network. All the computers must be logged into iTunes under the same account for Home Sharing to work.
- **Videos:** You can download videos, movies or TV shows from the iTunes Store to watch them in iTunes and download them to an [iPod video](#). You can also convert your [DVDs](#) to iTunes video format using one of many pieces of external software available for just this purpose. See [Engadget: HOW-TO: Convert a DVD for your iPod \(with video\) in Windows](#) and [AfterDawn Forums: Rip Convert DVD to iPod, iPod Video Converter](#).
- **Audiobooks:** You can listen to audiobooks (Audible .aa file format) through iTunes.
- **Editing ID3 tags:** ID3 tags are bits of data attached to a song that can include the artist name, album title, release date, music genre, album art and other related items. You can edit the tags and add tag data to your songs through iTunes.
- **iTunes Store:** The iTunes Store is an integrated function of the software. Click the store icon in the main iTunes interface to browse and buy content online, or click the icon next to any song, album or artist in your library to go directly to that content in the Music Store.

So that's what the software can do. In the next section, we'll find out how to get started with iTunes on your computer.



The iTunes music library gives you multiple options to organize and listen to your music collection. Screenshot by [HowStuffWorks.com](#)

TOOLS FOR LISTENING

- [MP3 Quiz](#)

The iTunes Interface

Here's an overview of the main iTunes interface (version 10) on a Windows machine (the Mac interface is almost identical).

There are really just a few steps to getting started with iTunes:

1. **Download and install the software:** Go to www.apple.com/itunes/ and click "[Free Download](#)". When you install the software, it asks if you want it to move your current music library into iTunes. It'll find it and import it all at once, organizing your files in folders by artist name and then at a second level by album title. If you don't want to import your music during the installation process because you want more control over what gets moved where, then you can do it manually after the installation (see step 2).
2. **Import your music:** You have two options in the "File" menu at the top of the iTunes interface. You can add a file to your iTunes library, add a folder to your iTunes library, or "Import." If you "Import," iTunes will search for your music and give you the option to import it all at once, which is basically the same process as letting iTunes import your music during installation. Once you import some music, the iTunes library looks something like this:

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- [Discovery.com: Discovery Channel Podcasts](#)

1. **Create a playlist** - Click the "+" button at the bottom-left of the iTunes interface. A new playlist will appear in the Source column.

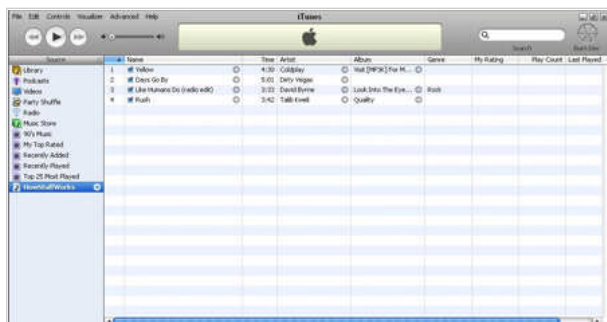
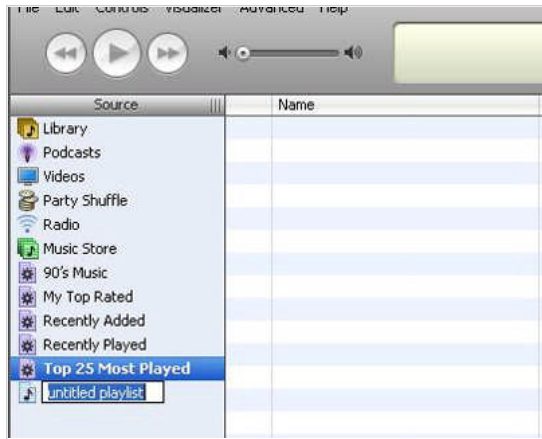
Name your playlist. We'll call ours "HowStuffWorks." Then right-click on each song in your library that you want on this playlist and choose "Add to Playlist" from the list of options. The playlist you just named will appear for you to choose it.

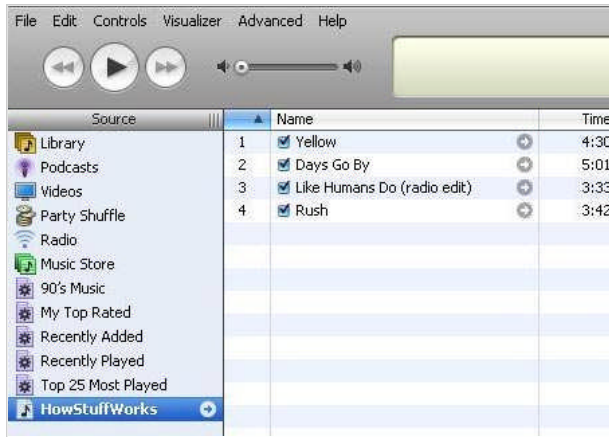
Here's our new playlist:

1. **Burn the playlist to a CD or DVD:** Just put a CD-R or DVD-ROM in your drive, and the iTunes software detects it. Now the Browse/Burn button in the top-right corner of the iTunes interface is for burning. Click it. Done. You'll have your new CD or DVD in a few minutes (depending on how many tracks are in your playlist and the speed of your disc burner).

2. **Download your music to an iPhone or iPod** - Plug your iPhone, iPod or iPad into your computer's USB 2.0 port. Done. iTunes sees the player and downloads your entire iTunes library. If you'd rather transfer files manually or only transfer certain playlists, you can change the sync settings at Edit/Preferences/Devices.

Once you've got a feel for the software, check out the Advanced tab and the Preferences and View Options areas under the Edit tab at the top of the screen. From here, you can play with some of the features like display settings, file-type conversion, burn speed, parental controls and podcast settings. And you might want to explore the built-in iTunes Store to add to your library of content. In the next section, we'll visit the iTunes Store.





IS APPLE SPYING?

The Genius feature analyzes your music library and suggests new music that you might want to purchase. That means Apple is collecting information about the music libraries of its customers. Apple first began collecting this kind of information -- which the company claims is anonymous and isn't recorded -- when it introduced the MiniStore. The Genius feature is opt-in. You don't have to turn it on if you don't want to.



iTunes Store

At the iTunes Store, you can find millions of songs, thousands of audiobooks, thousands of music videos, tens of thousands of podcasts, feature films, TV shows, iPad, iPod and iPhone applications, and CD album art. All you do to get to the store is click a button in the main iTunes screen. You're not going through a Web browser -- the jukebox software is the user interface for the store.

Apple has deals with record labels for iTunes-exclusive music tracks from select artists. In addition to pure content, there are community-type functions like user-published reviews, ratings and playlists, and then there is the pop-culture headshaker that is the "celebrity playlist." These are lists of songs (with a little "buy song" button next to each track) reportedly assembled by stars like Quentin Tarantino, RuPaul and Lady GaGa. In case you're curious, Lady GaGa included songs like "Thriller" by Michael Jackson, "Blue Christmas" by Elvis Presley and "Radio Ga Ga" by Queen. She also included three of her own tunes on her list. There's also a podcast dedicated to celebrity playlists if you want to keep up with what the rich and famous listen to.

Here's a breakdown of the store content areas and what you can do there:

Music

- Wide price range for albums
- Browse by genre

Music videos

- \$1.49 or \$1.99 each
- Browse by music genre (first level) and artist (second level)

Audiobooks

- Wide price range
- Browse by category (first level) and author (second level)

TV shows

- \$0.99 to rent an episode for up to 30 days -- you have 24 hours to finish an episode once you start it.
- \$1.99 to buy most episodes, \$2.99 for HD episodes and selected content, or a group rate for an entire season
- Browse by title (first level) and season (second level)

Feature-length films

- \$4.99 to \$19.99 each, some are available in HD
- \$0.99 to \$3.99 to rent a film for up to 30 days -- once you start viewing it, you have 24 hours to finish it
- Browse by category

Podcasts

- Most are free, variable prices on others
- Browse by category
- Download per episode or subscribe to series
- [Submit your own podcast](#) to appear in the iTunes podcast library

iPhone and iPod Applications

- Many are free, variable prices on others
- Browse by name, genre, price and best-selling

Movie Trailers

- **Free** (streaming format, not to download)
- Browse by movie studio or movie genre

In addition to browsing each content area, you can also perform a **search**. There's a search box on the main store page where you just enter a keyword, and iTunes returns matching results from all areas of the store. You can also perform a "power search" by song, artist, album, genre or composer. If you enter "Adam Sandler" in the "artist" field and choose "comedy" as the genre, you'll get a list of all of Adam Sandler's songs and albums available on iTunes. If your mother has set up parental controls to limit your access to explicit content, you'll see a lot fewer results than we did.

Apple also includes a link to free content available for iTunes. This can include samples from all the categories we've listed. Sometimes the free content is available for only a limited time so it's a good idea to check this section regularly if you're interested.

To buy content, you need to set up an iTunes payment account. To set up an iTunes account, you provide a [credit card](#) number or [PayPal](#) account that you'll use for all of your purchases. You can also pay using an iTunes Allowance (sort of like a debit account, typically set up by parents for their kids) or by Music Card or gift certificate.

To make a purchase in the iTunes store, all you have to do is click the "Buy" button next to the song, video or app. Apple will charge your account and the download will begin. If you have to shut down your computer in the middle of your download, the process will continue once you reboot your computer and log into iTunes. It's important to create a backup of your iTunes library. Songs, videos and iPod games (not apps) can only be downloaded once per purchase. Apps are different -- once you purchase an app, you can download it again for free. You just have to use the same iTunes account as the one used to purchase the app the first time.

CAN I PUT MY MUSIC ON ITUNES?

Submitting your music to iTunes is not a simple task. You don't just click a button like you do with a podcast. You need to be a company, first of all; you need a [UPC code](#) for your album and an [ISRC code](#) for each track on it; and you need to be passably good -- Apple reviews the submissions and chucks the bad stuff. See [CNET: How to take part in iTunes Music Store's success](#) to learn more.



Need to catch up on your television shows? You can check them out through iTunes.
Screenshot by HowStuffWorks.com

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Security in iTunes

All purchases are accomplished via an SSL (Secure Socket Layer) connection that encrypts the data. Exchanges related to browsing content and sampling songs happens in simple HTTP (hypertext transfer protocol) through a proxy server, which is a lower level server that sits between your computer and the main iTunes [Web servers](#). This cuts down on requests sent to the main system architecture. Here's what else we know about the store's technology infrastructure:

The iTunes Music Store is composed of XML-based pages, lots of them encrypted using 128-bit AES in CBC mode. AES-CBC is a type of symmetric-key encryption. AES (for advanced encryption standard) basically takes a 128-bit block of code and reorganizes it into a 128-bit block of ciphertext using a particular key (an encryption algorithm). CBC (cipher block chaining) mode is a method of disguising any encryption patterns that might reveal the key. In CBC, what happens is sort of like a double-layer encryption scheme. During the encryption process, each consecutive, 128-bit block of unencrypted text (we'll call this the "original block") is XORed with the previous, already encrypted block of ciphertext to generate a 128-bit block of text that represents the original block. The "XOR" operation is a piece of computer code that returns values based on an "exclusive OR" formula -- for example, an XOR operation might state that if the first bit in the original block OR the first bit in the ciphertext block is "1" (but only one or the other), then the resulting value is "1." This "1" is now the first bit in the new, 128-bit "representational block." It is the representational block that will be encrypted using the key. In this way, if you were encrypting a page that had two consecutive, identical 128-bit blocks of code, they would end up as completely different blocks of ciphertext.

The same key is used to encrypt and decrypt the ciphertext -- that's the "symmetric" part of the process. Once each block is decrypted using the key, the XOR operation is reversed to generate the original block of text. See [Cryptographic Algorithms and RFC 3602](#) to learn more about AES-CBC encryption.

As we already mentioned, the iTunes Store once used a proprietary encryption method called FairPlay for its digital rights management scheme. When you purchased a song, the file was encrypted as part of the download process. Next, we'll take a closer look at FairPlay and the controversy that surrounded it.

THE GIFT OF ITUNES

You can buy someone an iTunes Music Card (purchased at a retail store) or iTunes gift certificate (purchased through iTunes) for a certain dollar amount, or you can actually buy someone a specific piece of content. Your giftee will receive [e-mail](#) notification of the gift and instructions on how to "pick up" the file at the iTunes Store.



The iTunes store contains a large library of audio books. Screenshot by HowStuffWorks.com

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iTunes and FairPlay

FairPlay was an Apple-proprietary encryption scheme that determined what users could do with a file once they downloaded it. FairPlay let you:

- authorize up to five different computers to play FairPlay-protected files
- burn a protected song to CD as many times as you want
- burn a particular playlist containing a protected song up to seven times

To authorize a computer, all you had to do was to try to play a protected song on it. When you did, the computer generated a unique [ID](#) and sent it to the iTunes server, requesting authorization. If there were fewer than five authorizations on your account, the server added this unique ID to your account and sent back a decryption key to store on the computer. The key itself was encrypted so you couldn't just send it to someone else to use. This computer was then authorized to play FairPlay-protected songs registered to that account. The next time you clicked on a protected song, the iTunes software used the computer's authorized ID to decrypt the key and then used the key to decrypt the song. Newer tracks on the iTunes Store are free of FairPlay encryption, but the technology still works if you attempt to play an older encrypted track.

Most of the controversy surrounding FairPlay was about Apple's refusal to license it, not about the limitations it imposed -- as far as DRM schemes go, FairPlay wasn't overly restrictive. But since Apple didn't license FairPlay to anyone, you could only play a protected file using iTunes software,

and you could only take it with you on an iPod, iPhone or an iTunes phone. By keeping FairPlay in-house, Apple effectively created a dependence loop between iTunes and iPod that some went so far as to call a monopoly on digital entertainment. In January 2005, one person filed a class-action [lawsuit](#) against Apple to this effect, claiming the company is violating federal [anti-trust laws](#).

The other problem with FairPlay was that it created a Linux shut-out. Since protected songs will only play on iTunes, and iTunes is only compatible with Mac OS X and Windows XP or later, people who use the Linux [operating system](#) without running a virtual Windows machine can't buy content at the iTunes Store (actually, they can buy it -- they just can't play it). This led to an ongoing war between Linux hackers and Apple. The most famous example of this battle is the back-and-forth between a team of hackers led by "DVD Jon" Johansen (who cracked the DeCSS encryption on protected DVDs in 2002) and Apple programmers [source: [Borland](#)].

In January 2004, Johansen published a piece of code that disabled Apple's DRM scheme on the user end, allowing people to play FairPlay-protected files on a Linux machine. In March 2005, Johansen released a piece of software that disabled FairPlay on the Apple end, creating a glitch in the download process that stopped the encryption from being applied to a file. Just days later, Apple released a new version of the iTunes software that disabled this glitch. One day later, Johansen released another piece of code that recreated the glitch. And from there it went on in much the same vein.

ITUNES ALTERNATIVES

- [eMusic](#)
- [MSN Music](#)
- [Napster](#)
- [Rhapsody](#)
- [Wal-Mart Music Downloads](#)

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iTunes and Digital Rights Management

The digital-media business has gotten a lot more complicated in the last decade. When [file-sharing networks](#) opened a gaping hole in the entertainment industry's ability to control the distribution of its content, a war broke out between copyright holders and consumers. The current manifestation of that war is [DRM](#) and DRM hacking. FairPlay was only one example of DRM -- many companies dealing with licensed digital content have adopted DRM schemes that limit what a consumer can do with legally purchased files. See [How Digital Rights Management Works](#) to learn more.

The fact is, working with the entertainment industry to license content is not a simple process. When Apple strikes a deal to sell licensed content, everybody wants a cut. As soon as iTunes started offering TV shows, Apple having struck deals with the TV networks that own those shows, the five entertainment-industry unions decided they needed a cut, too. So out of that \$1.99-per-show charge, Apple is paying royalties to a whole lot of people. Subtract from that the cost of building and maintaining the iTunes technology infrastructure, paying credit-card fees and advertising the service, and it looks like Apple's iTunes Store is more of a marketing

[vehicle](#) than a big revenue generator for the \$8 billion company. In short: The iTunes Store helps sell iPods, iPhones and iPads.

The backlash against DRM didn't go unnoticed. In 2007, music publisher EMI announced it would sell unprotected music on iTunes. Any song from EMI would come without the FairPlay DRM. In early 2009, Apple announced that it was phasing out the FairPlay technology throughout the iTunes Store. Today, any song you purchase from iTunes shouldn't have any DRM technology associated with it. Older songs purchased during the FairPlay era still have DRM code. Apple allows users to upgrade to a non-DRM version of the song for 30 cents per song. Alternatively, you can burn the old music files to a CD, which removes the Fairplay DRM from the tracks. Then you can rip the songs back to iTunes.

Future of iTunes

The future of iTunes most certainly includes ongoing hacking wars. One can only wonder if Apple will release a version of iTunes for Linux, if only to eliminate the legitimate complaint that [Linux](#) people don't get to use the iTunes Store.

The introduction of the iPhone, iPad and the iPod touch have increased demand for the iTunes service, particularly the App Store. But it also means bad news for third-party products. Now that Apple is in the smartphone game, it no longer partners with other phone manufacturers to support iTunes implementation. From a business perspective this makes sense -- Apple is famous for trying



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to control as much of the customer experience as possible. By eliminating support of third-party products, Apple channels more customers to its own line of devices.

Apple also introduced Apple TV, a device that can play iTunes content on [televisions](#). In September 2010, Apple unveiled some new features for Apple TV, including a partnership with Netflix. Apple is also expanding its content in unexpected [directions](#) like [iTunesU](#) -- a free service for universities to post lectures and other content for their students to download through the iTunes software. This prompted the University of Missouri's School of Journalism to include a new requirement for all incoming freshmen in 2009: every student must purchase an [iPod touch](#) or iPhone to access class materials [source: [Rivera](#)]. Though the word "requirement" may sound as though students will get themselves in trouble if they don't own an iPod or [iPhone](#), the truth behind the arrangement is less extreme -- by making the devices a requirement, students could build the price of the device into their student financing requests. The school stated that students wouldn't be punished for not owning an Apple-branded product.

The next logical step might be to offer a similar service to businesses -- they could use iTunes to supply recorded meetings or training lectures to remote workers and frequent travelers. The future may see iTunes as standard software on office computers (and tiny iPod speakers embedded in the lapels of dark-blue suits everywhere).

For more information on iTunes, visit the links on the next page.

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- [How Digital Rights Management Works](#)

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