

## Exhibit 833-09: Airport Express

The Apple Airport Express and software and computer used in connection with the Apple Airport Express (collectively “Airport Express”) were sold or offered for sale in the United States—and became known or used by others in the United States—before June 5, 2004, which is the earliest application date to which U.S. Patent No. 10,541,883 (“the ’883 Patent”) can claim priority. Moreover, Airport Express was in public use or on sale in the United States more than one year before June 5, 2004. Accordingly, Airport Express constitutes prior art to the ’883 Patent under at least 35 U.S.C. §§ 102(a), (b).

Airport Express anticipates claims 1, 2, 4, 5, 9, 10, 11, 13, 14, 15, 16, 17, and 19 (the “Asserted Claims”) of the ’883 Patent under 35 U.S.C. §§ 102(a), (b).

To the extent any limitation is found not to be expressly or inherently disclosed in Airport Express, such a limitation would have been obvious either based on Airport Express alone, given the state of the art, or in combination with one or more of the references cited in Exhibits 883-01 through 883-11, or Exhibit 883-B because the ’883 Patent is merely a collection of prior art elements that fails to meet the statutory requirement of non-obviousness under 35 U.S.C. § 103, and the factors delineated in *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007), weigh against a finding of non-obviousness.

Additionally, on information and belief, inventors working for Airport Express made the claimed invention in the United States before the inventors listed on the ’883 Patent. As evidenced by the products above and the evidence cited below, those inventors working for Airport Express did not abandon, suppress, or conceal the claimed invention. Accordingly, on information and belief, Airport Express constitutes prior art to the ’883 Patent under 35 U.S.C. § 102(g)(2).

Thus, Airport Express anticipates the Asserted Claims of the ’883 patent under 35 U.S.C. §§ 102(a) and § 102(g)(2).

Any disclosures identified for each limitation of the ’883 Patent in the aforementioned Exhibits may be combined with Airport Express below for the same limitation to render that limitation obvious. A POSITA would have found such a combination/modification obvious for the reasons discussed herein and in Defendant’s cover pleading.<sup>1</sup>

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<sup>1</sup> Plaintiff appears in many instances to be pursuing overly broad constructions of limitations of the asserted claims in an effort to piece together an infringement claim where none exists. This claim chart accounts for overly broad construction of the claim limitations. Any assertion that a particular limitation is disclosed by a prior art reference or references may be based on Plaintiff’s apparent constructions and is not intended to be, and is not, an admission that such constructions are supportable or proper. Defendant is investigating this prior art and has not yet completed discovery from third parties, who may have relevant information concerning the prior art. Therefore, Defendant reserves the right to supplement this chart after additional discovery is received. To the extent that any of the prior art discloses the same or similar functionality or feature(s) of any of the accused products, Defendant reserves the right to argue that said feature or functionality does not practice any limitation of any of the asserted claims, and to argue, in the

## Exhibit 833-09: Airport Express

Airport Express is described by at least the following documents:<sup>2</sup>

- Airport Express Setup Guide (“Airport Express Setup Guide”);
- Airport Express Setup Description posted by Columbia University IT Department (“Airport Express Setup Example”);
- an actual Apple Airport Express product and pictures thereof (collectively “Airport Express Product”);
- Teardown of the Apple Airport Express (“Airport Express Teardown”) available at <https://www.vonwenzel.net/ABS/Dissection-Express/index.html>;
- Apple technical document “Enabling Secure Storage with Keychain Services” (“Apple Keychain Services”);
- IEEE Internet Computing article “Autoconfiguration for IP Networking: Enabling Local Communication” by Erik Guttman (IEEE Internet Computing, May/June 2001 Volume, 81-86) (“Guttman”);
- IETF Zeroconf – Dynamic Configuration of IPv4 Link-Local Addresses by Cheshire et al. (Draft Version 14, March 31, 2004) (“IETF Zeroconf”);
- GitHub apple-oss-distributions documentation on Apple mDNS and associated applications and services (“GitHub mDNS Documentation”) available at <https://github.com/apple-oss-distributions/mDNSResponder>;
- Apple Rendezvous and Bonjour source code (“Apple Source Code”) available at <https://github.com/apple-oss-distributions/mDNSResponder>, <http://developer.apple.com/darwin/projects/rendezvous/>, and <https://opensource.apple.com/releases/>;
- Apple Developer Documentation “SCNetwork Configuration” API collections (“Apple Network Configuration API”) available at <https://developer.apple.com/documentation/systemconfiguration?language=objc>;
- U.S. Patent No. 7,532,862 (“Cheshire”);
- U.S. Patent No. 8,797,926 (“Kearney”); and
- Testing of the Airport Express prior art product. Physical samples and testing equipment originally made available for inspection in the ITC care are also being made available for inspection here. Google intends to and reserves the right to rely on the results from testing those physical samples. In addition, Google reserves the right to rely on additional testing equipment, including older testing laptops and other equipment that predate the earliest priority date of the ’883

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alternative, that if said feature or functionality is found to practice any limitation of any of the asserted claims, then the prior art reference teaches the limitation and that the claim is not patentable.

<sup>2</sup> Defendant does not concede that the ‘896 Patent is entitled to its alleged priority date of June 5, 2004. To the extent any of the documents cited herein are dated after June 5, 2004, the relevant features and functionalities Defendant refers to in this contention were known to the public prior to June 5, 2004. Discovery is ongoing, Defendant specifically reserves its rights to supplement these documents as additional information becomes available.

## Exhibit 833-09: Airport Express

patent and more complex network topologies used for the claimed “initial communication path.”

These documents also evidence public sale, offer for sale, knowledge, and use of Airport Express before June 5, 2004. Additional evidence of public sale, offer for sale, knowledge, and use of Airport Express before June 5, 2004 is found in the following documents:

- Apple press release “Apple ‘Open Sources’ Rendezvous” dated September 25, 2002;
- The New York Times news article “Company supports Apple: Philips sets up a ‘Rendezvous’” dated September 11, 2002;
- Apple press release “TiVo, Brother & Aspyr announce Rendezvous networked products” dated January 7, 2003;
- Apple press release “Epson, HP & Lexmark Support Apple’s Rendezvous Technology” dated July 17, 2003; and
- Apple press release “Apple unveils Airport Express for Mac & PC users” dated June 7, 2004.<sup>3</sup>

The references cited in this chart are representative of the structures in Airport Express. The citations to portions of any reference in this chart are exemplary only. Citations presented for one claim limitation are expressly incorporated by reference into all other limitations for that claim, as well as all limitations of all claims on which that claim depends.

Defendant’s investigations regarding Airport Express are ongoing. Defendant reserves the right to amend any and all contentions regarding Airport Express based on additional information obtained from any third parties, or based on any other information Defendant may obtain through discovery or its own continuing investigations.

Defendant reserves the right to rely on additional citations or sources of evidence that also may be applicable, or that may become applicable in light of claim construction, changes in Plaintiff’s infringement contentions, and/or information obtained during discovery as the case progresses.

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<sup>3</sup> To the extent the release date of Airport Express was after June 5, 2004, the relevant features and functions of Airport Express were known to the public well before June 5, 2004. For example, Apple released multiple generations of the Airport series products starting in 1999. For another example, relevant technologies adopted in Airport Express were substantially disclosed in Apple Rendezvous.

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

#### 1[pre] A playback device comprising:

Defendant does not concede that the preamble is limiting. To the extent it is limiting, Airport Express discloses the preamble. For example, Airport Express discloses a wireless adapter that can be connected to a stereo and plays music via iTunes. *See, e.g.*, the following:



Airport Express Product.

#### Congratulations on purchasing AirPort Express. Read [this guide to get started using it.](#)

You can use AirPort Express to share your broadband Internet access with wireless computers on your network, play iTunes music on your home stereo, and much more.

Your AirPort Express comes with AirTunes, a way to play iTunes music through remote speakers.

With AirPort Express, you can:

- Create a wireless network in your home, then connect to the Internet and share the connection with up to ten computers simultaneously. An entire family can be connected to the Internet at the same time.
- Connect AirPort Express to your home stereo or powered speakers and use AirTunes to play your iTunes music on your home stereo from a Macintosh with an AirPort or AirPort Extreme Card, or a compatible Windows XP or 2000 wireless computer.
- Set up a wireless connection to your Ethernet network. AirPort and AirPort Extreme-equipped Macintosh computers or Windows XP or 2000 computers can then have access to an entire network without being connected with a cable.
- Extend the range of your network by adding AirPort Express to your existing AirPort Extreme or AirPort Express wireless network (this is called a Wireless Distribution System, or WDS).
- Connect a USB printer to your AirPort Express. All of the compatible computers on the AirPort network, both wireless and wired, can print to it.
- Create custom profiles so you can store settings for up to five different locations.

Airport Express Setup Guide at 4-5.

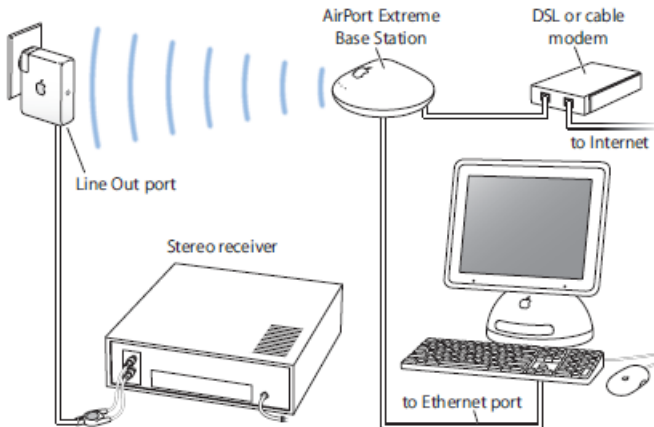
## Exhibit 833-09: Airport Express

### Exemplary Disclosures

#### Using AirPort Express on an Existing Wireless Network to Stream Music to Your Home Stereo

You can also connect AirPort Express to a wireless network and use iTunes to play music on your stereo from iTunes. Connecting AirPort Express to your existing network allows you to place AirPort Express in another room, within range of your network.

#### What It Looks Like



Airport Express Setup Guide at 17.

See also, Cheshire at FIG. 1, 3:3-10.

To the extent that Airport Express is found not to disclose the preamble, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant's cover pleading.

**1[a] a network interface that is configured to provide an interconnection with at least one data network;**

Airport Express discloses this feature. For example, the Airport Express includes a network interface that is configured to provide an interconnection with a wireless and/or wired data network. See, e.g., the following:

## Exhibit 833-09: Airport Express

### Exemplary Disclosures



Airport Express Product.

## AirPort Express Specifications

### AirPort Specifications

- *Wireless Data Rate:* Up to 54 megabits per second (Mbps)
- *Range:* Up to 150 feet (45 meters) in typical use (varies with environment)
- *Frequency Band:* 2.4 gigahertz (GHz)
- *Radio Output Power:* 15 dBm (nominal)
- *Standards:* 802.11 DSSS 1 and 2 Mbps standard, 802.11b, and 802.11g specification

### Interfaces

- RJ-45 Ethernet LAN connector for built-in 10/100Base-T (↔)
- Universal Serial Bus (USB) printing (🖨)
- Analog/digital optical 3.5mm mini-jack
- AirPort Extreme

### Environmental Specifications

- *Operating Temperature:* 32° F to 95° F (0° C to 35° C)
- *Storage Temperature:* -13° F to 140° F (-25° C to 60° C)
- *Relative Humidity (Operational):* 20% to 80% relative humidity
- *Relative Humidity (Storage):* 10% to 90% relative humidity, noncondensing
- *Operating Altitude:* 0 to 10,000 feet (0 to 3048 m)
- *Maximum Storage Altitude:* 15,000 feet (4572 m)

Airport Express Setup Guide at 44.

For example, the Airport Express includes a Broadcom BCM2050 chipset for WiFi connection.

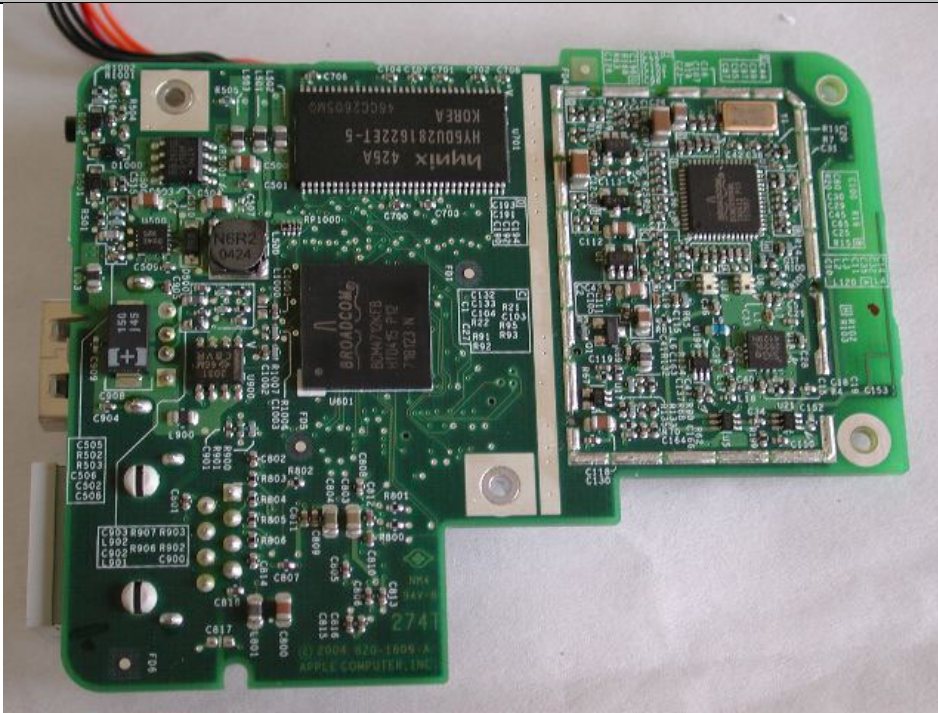
Exemplary Disclosures



Airport Express Teardown.

Exhibit 833-09: Airport Express

Exemplary Disclosures



Airport Express Teardown.

See also, Cheshire at FIG. 1, 3:3-21.

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant’s cover pleading.

**1[b] at least one processor;**

Airport Express discloses this feature. For example, the Airport Express includes a Broadcom BCM4712KFB application processor that performs functions such as managing network connectivity, communicating with the computer (e.g., a Mac or PC with the Airport Express software installed), decoding audio formats, etc. See, e.g., the following:

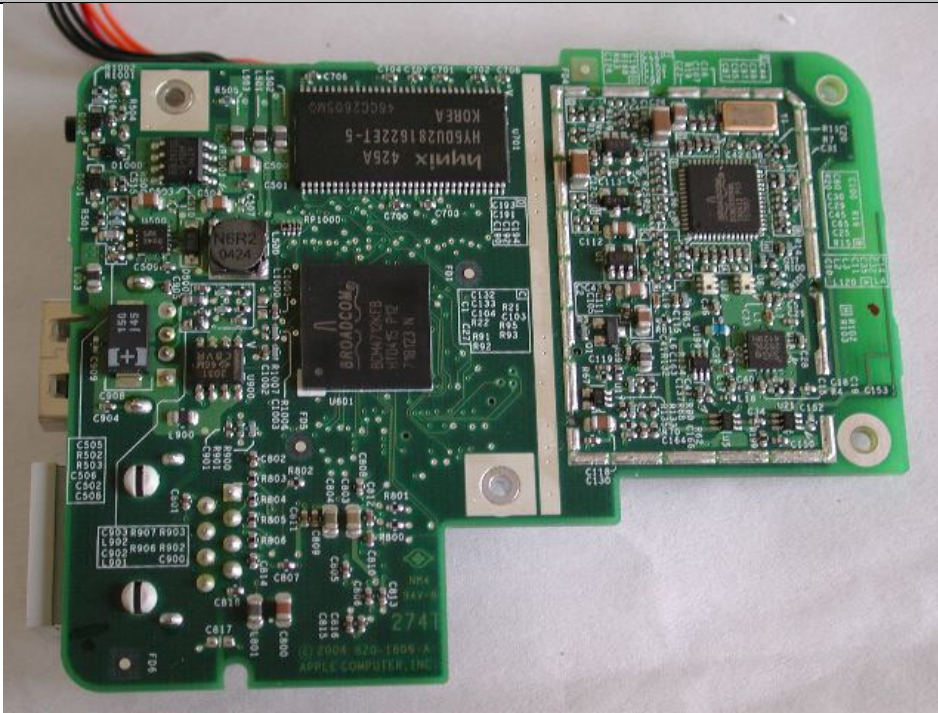
Exemplary Disclosures



Airport Express Teardown.

Exhibit 833-09: Airport Express

Exemplary Disclosures



Airport Express Teardown.

See also, Cheshire at FIG. 1, 3:3-10.

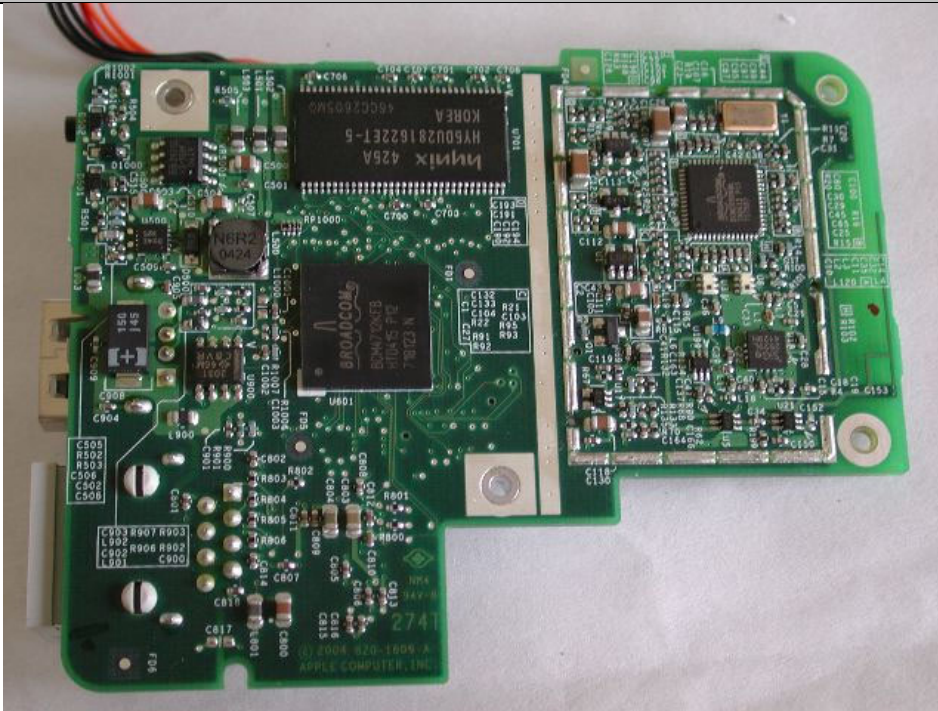
To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant’s cover pleading.

**1[c] a non-transitory computer-readable medium; and**

Airport Express discloses this feature. For example, the Airport Express includes a non-transitory computer-readable medium for storing software, driver and/or firmware to operate the device, such as the Hynix and the Atmel memories. See, e.g., the following:



Exemplary Disclosures



Airport Express Teardown.

See also, Cheshire at FIG. 1, 2:48-51, 3:3-10.

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant’s cover pleading.

**1[d] program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:**

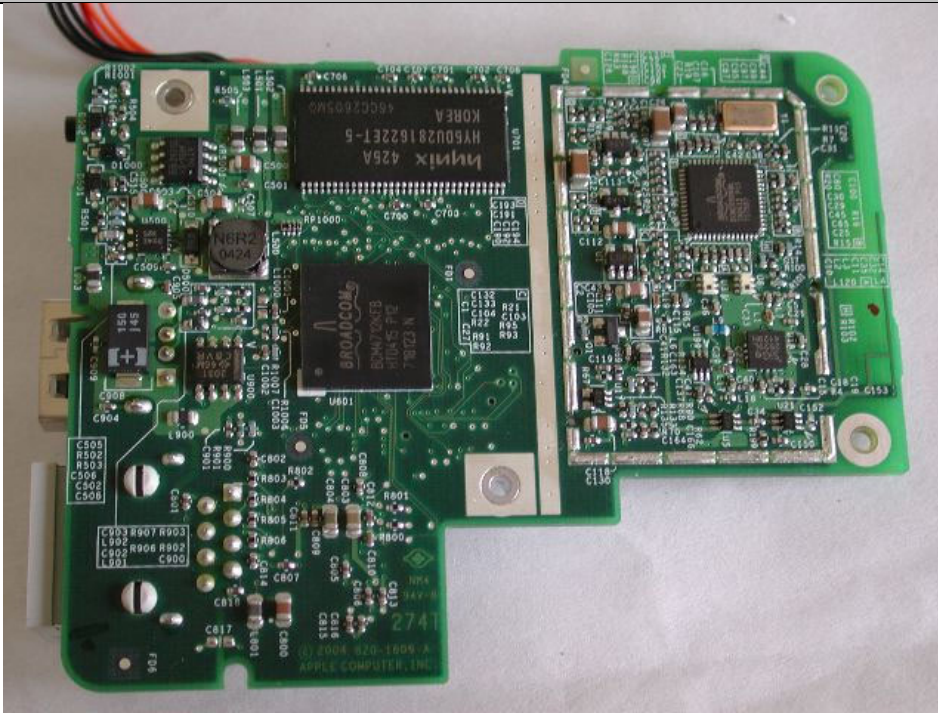
Airport Express discloses this feature. For example, the Airport Express includes program instructions stored on the non-transitory computer-readable medium including software, driver, and/or firmware that are executed by the processor and cause the Airport Express to perform functions, including responding to commands from a computer installed with Airport Express software. See, e.g., the following:

Exemplary Disclosures



Airport Express Teardown.

Exemplary Disclosures



Airport Express Teardown.

About the AirPort Software

AirPort Express works with the AirPort software included on the AirPort Express CD.



**AirPort Setup Assistant**

Use the AirPort Setup Assistant (or the AirPort Express Assistant if you are using Windows XP) to set up your AirPort Express to connect to the Internet, play iTunes music on your home stereo or powered speakers, and share a printer. You can also bridge your AirPort Express to your existing AirPort Extreme or AirPort Express wireless network to extend the range of your network (WDS).



**AirPort Admin Utility**

AirPort Admin Utility is an advanced tool for setting up and managing AirPort Extreme and AirPort Express base stations. Use AirPort Admin Utility to adjust network, routing, and security settings and other advanced options.



**AirPort status menu in the menu bar**

Use the AirPort status menu to switch quickly between AirPort networks, monitor the signal quality of the current network, create a Computer-to-Computer network, and turn AirPort on and off. The status menu is available on computers using Mac OS X.

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

#### What You Need to Get Started

To set up AirPort Express using a Macintosh, you must have the following:

- A Macintosh computer with an AirPort or AirPort Extreme Card installed
- Mac OS X v10.3 or later
- iTunes 4.7 (included on the AirPort Express CD) or later

To set up AirPort Express using a Windows PC, you must have the following:

- A Windows PC with 300 MHz or higher processor speed
- Windows XP Home or Professional
- iTunes 4.7 for Windows (included on the AirPort Express CD) or later

You need iTunes 4.6 or later to play audio from your computer to a stereo connected to AirPort Express. To be sure you have the latest version of iTunes, go to [www.apple.com/itunes](http://www.apple.com/itunes).

You can use AirPort Express with any wireless-enabled computer that is compliant with the IEEE 802.11b or 802.11g standards. To set up AirPort Express, your computer must meet the requirements listed above.

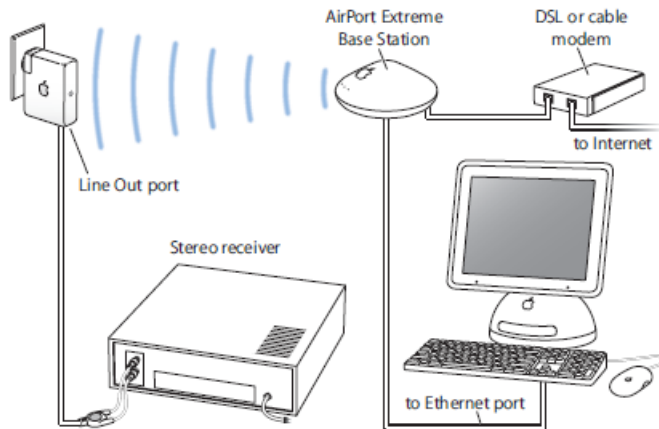
**Note:** If you are using Windows 2000, use AirPort Admin Utility for Windows to set up your AirPort Express. The AirPort Express Assistant is not compatible with Windows 2000.

Airport Express Setup Guide at 7-8.

#### Using AirPort Express on an Existing Wireless Network to Stream Music to Your Home Stereo

You can also connect AirPort Express to a wireless network and use iTunes to play music on your stereo from iTunes. Connecting AirPort Express to your existing network allows you to place AirPort Express in another room, within range of your network.

#### What It Looks Like



Airport Express Setup Guide at 17.

See also, Cheshire at FIG. 1, 2:48-51, 3:3-10.

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant's cover pleading.

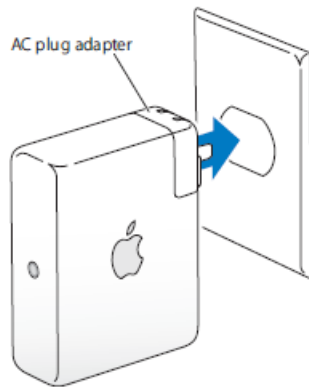
**1[e] detecting a triggering event that causes the playback device to enter a setup mode in which the playback device transmits at least a first message indicating that the playback device is available for setup;**

Airport Express discloses this feature. For example, when the Airport Express is being configured, the Airport Express enters a setup mode and transmits a first message, indicating that the device is available for set up. *See, e.g.*, the following:

#### Plugging In AirPort Express

Before you plug in your AirPort Express, first connect the appropriate cables to the ports you want to use, including the Ethernet cable connected to your DSL or cable modem (if you will connect to the Internet), the audio cable connected to your stereo (if you will use iTunes to play music from iTunes) and a USB cable connected to a compatible USB printer (if you will print to a USB printer).

Once you have connected the cables for all the devices you plan to use, connect the AC plug adapter if necessary. Plug AirPort Express into the wall. There is no on switch.



## Exhibit 833-09: Airport Express

### Exemplary Disclosures

When you plug AirPort Express into the wall, the status light flashes green and then glows amber while it starts up. Once it has started up completely, the status light glows solid green.

#### AirPort Express Status Lights

The following table explains AirPort Express light sequences and what they indicate.

Light	Status/description
Off	AirPort Express is unplugged.
Flashing green	AirPort Express is starting up. <i>Note:</i> If you choose Flash On Activity from the Status Light pop-up menu in the Base Station pane of AirPort Admin Utility, the status light may flash green to indicate normal activity.
Solid green	AirPort Express is on and working properly. If you choose Flash On Activity from the Status Light pop-up menu in the Base Station pane of AirPort Admin Utility, the status light may flash green to indicate normal activity.
Flashing amber	AirPort Express cannot establish a connection to the network or the Internet. See "Your AirPort Express Status Light Flashes Amber" on page 38.
Solid amber	AirPort Express is completing its startup sequence.
Flashing amber and green	There may be a problem starting up. AirPort Express will restart and try again.

#### What's Next

After you plug in AirPort Express, you use the AirPort Setup Assistant on a Macintosh computer to set it up to work with your Internet connection, stereo, USB printer, or existing network. If you are using a computer with Windows XP, use the AirPort Express Assistant to set up AirPort Express. If you are using a computer with Windows 2000, use AirPort Admin Utility.

See "Using AirPort Express" on page 12 for examples of all the ways you can use AirPort Express, and information about how to set them up.

Then see "Setting Up AirPort Express" on page 26 to find out more about the setup process.

Airport Express Setup Guide at 9-11.

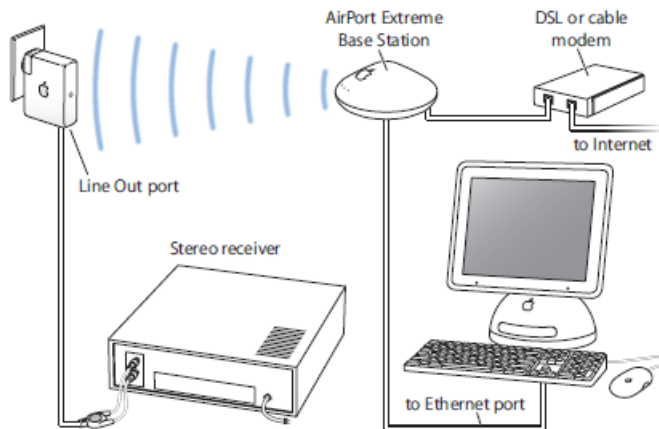
## Exhibit 833-09: Airport Express

### Exemplary Disclosures

#### Using AirPort Express on an Existing Wireless Network to Stream Music to Your Home Stereo

You can also connect AirPort Express to a wireless network and use iTunes to play music on your stereo from iTunes. Connecting AirPort Express to your existing network allows you to place AirPort Express in another room, within range of your network.

#### What It Looks Like



Airport Express Setup Guide at 17.

#### This chapter provides information and instructions for using the AirPort Express software to set up your AirPort Express.

Use the diagrams in the previous chapter to help you decide where you want to use your AirPort Express, and what features you want to set up on your AirPort network. Then use the instructions in this chapter to easily configure AirPort Express and set up your AirPort network.

AirPort Express software lets you:

- Set up a new network that wireless computers can use to communicate with each other. If you set up your AirPort Express as a base station and connect it to the Internet, wireless computers can also share the Internet connection.
- Connect your AirPort Express to your existing wireless network and use iTunes to play iTunes music on your home stereo or powered speakers, and connect a USB printer to share.
- Connect your AirPort Express to your existing AirPort Extreme or AirPort Express network and extend the range of your wireless network using the AirPort Express as a wireless bridge. This is known as a WDS (Wireless Distribution System).

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

You can use iTunes to play music from iTunes and share a USB printer in any type of network you set up, whether it is a new network or you are joining an existing network.

If you have more than one AirPort Express, you can connect one to the stereo in your living room and connect another to the powered speakers in your den. Using iTunes, you can stream your iTunes music to either AirPort Express, depending on where you are in your house. Choose the name of the AirPort Express you want to use from the speakers pop-up menu in iTunes.

This chapter provides an overview for using the AirPort Express Assistant to set up your network and other features of your AirPort Express. For more detailed wireless networking information, and for information about the advanced features of AirPort, refer to the document "Designing AirPort Networks," or "AirPort Networks for Windows," located on the AirPort Express CD, and at [www.apple.com/airportextreme](http://www.apple.com/airportextreme).

You can do most of your network setup and configuration tasks with the AirPort Setup Assistant for Mac OS X and the AirPort Express Assistant for Windows XP. To set advanced options, you need to use AirPort Admin Utility. See "Setting Advanced Options" on page 32.

**Note:** If you are using Windows 2000, use AirPort Admin Utility for Windows to set up your AirPort Express. The AirPort Express Assistant is not compatible with Windows 2000.

#### Using the AirPort Setup Assistant or the AirPort Express Assistant

To set up and configure your AirPort Express to use AirPort for wireless networking and Internet access, use the AirPort Setup Assistant for Mac OS X, or the AirPort Express Assistant for Windows XP. (The assistant is installed on your computer when you install the software on the AirPort Express CD.)

##### On a Macintosh computer using Mac OS X v10.3 or later:

- Open the AirPort Setup Assistant, located in Applications/Utilities, and follow the onscreen instructions.

##### On a computer using Windows XP:

- Open the AirPort Express Assistant, located in Start > All Programs > AirPort Express Assistant.



You will be asked a series of questions about the type of network you want to use and the services you want to set up. The AirPort Setup Assistant or AirPort Express Assistant helps you enter the appropriate settings for the network you are setting up.

Airport Express Setup Guide at 26-28.

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

#### Connecting to an Existing Wireless Network

You can use the AirPort Express Assistant to join an existing wireless network. When you connect your AirPort Express to your home stereo, computers on your wireless network can use iTunes to play music on the stereo from iTunes. If you connect a USB printer to your AirPort Express, all of the computers on the network can print to it.

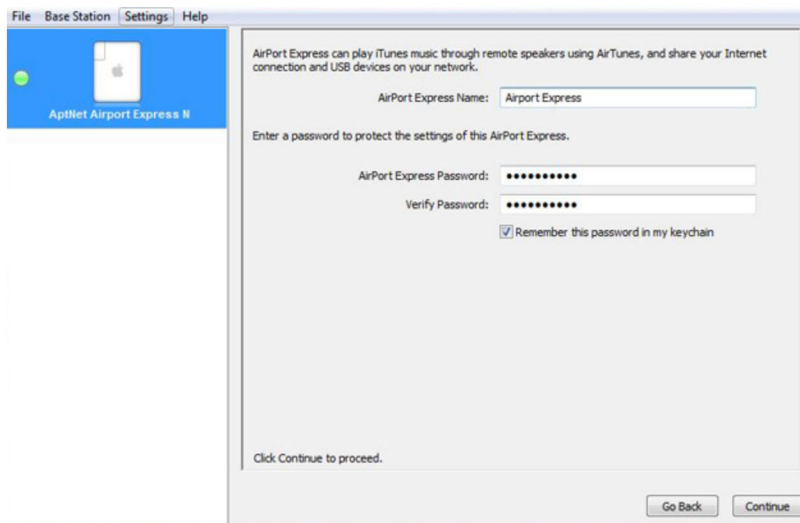
Be sure to connect the audio cable to your stereo and the USB cable to your printer before you use the AirPort Express Assistant.

- Open the AirPort Setup Assistant, located in Applications/Utilities on a Macintosh, or the AirPort Express Assistant, located in Start > All Programs > AirPort on a computer using Windows XP. Follow the onscreen instructions to connect your AirPort Express to your wireless network.

Airport Express Setup Guide at 31.

#### Apple Airport Express

1. To set up and configure your AirPort Express to use AirPort for wireless networking and Internet access, use the AirPort Setup Assistant for Mac OS X, or the AirPort Express Assistant for Windows XP. (The assistant is installed on your computer when you install the software on the AirPort Express CD or you can also download it from [Apple](#).)
2. After unpacking your AirPort Express, connect the ethernet cable from your jack to the ethernet port on the AirPort Express. Plug the AC adapter into an electrical outlet.
3. Open the AirPort Setup Assistant, located in Applications/Utilities on a Macintosh, or the AirPort Express Assistant, located in Start > All Programs > AirPort on a computer using Windows XP. Follow the onscreen instructions to configure and share Internet access on your AirPort Express.
4. Enter a Base Station Name and Password click Continue. Write these names down for future reference.



Airport Express Setup Example at 1.

*See generally, Apple Source Code.*

For another example, the Airport Express transmits a message through multicast DNS (mDNS) message exchange, indicating it is available for setup.

# Exhibit 833-09: Airport Express

## Exemplary Disclosures

### 4.1 mDNS Service Discovery

With our current mDNS Service Discovery, the process would be:

#### 4.1.1. Determine the domain to browse.

Since the user does not specify the domain in which to look for the `_hap` service, we first need to determine the appropriate domain, which is called the "browsing domain". mDNSResponder maintains a list of browsing domains, one of which is always `.local.`. Other browsing domains can be discovered using the mechanism described in [Section 11 of DNS-Based Service Discovery](#). Since the device is being advertised using multicast DNS on the local network, even if other default browsing domains are configured on that network, the domain in which it can be discovered will be `.local.`

#### 4.1.2. Determine where the query should be sent.

Like the browsing domain, the user does not know (and probably doesn't care) where the query should go. mDNSResponder will attempt to find the service in all of the default browsing domains. Since one of these is `.local`, which is resolved using multicast DNS, we will send a query for the service to the multicast address (`224.0.0.251` or `ff02::fb`).

#### 4.1.3. Find the service instances that are providing the `_hap._udp.` service.

To do that, mDNSResponder sends out a query with the domain and destination we get above with mDNS:

```
_hap._udp.local. PTR ?
```

Each device on the local network that is advertising an instance of the service will respond with an answer for its service:

```
_hap._udp.local. PTR my-homekit-device-1._hap._udp.local.  
_hap._udp.local. PTR my-homekit-device-2._hap._udp.local.
```

Now the user knows that there are two service instances in the network: `my-homekit-device-1._hap._udp.local.` and `my-homekit-device-2._hap._udp.local.` Suppose the user chooses `my-homekit-device-1._hap._udp.local.`

#### 4.1.4. Resolve the service instance.

mDNSResponder will then send out a query using mDNS, for the service instance name chosen by user:

```
my-homekit-device-1._hap._udp.local. SRV ?
```

The response will be the host name of the device, and the port number on which the service is available on that device:

```
my-homekit-device-1._hap._udp.local. SRV my-homekit-device-1.local 12345
```

#### 4.1.5. Resolve the local host name and connect to it.

To find the address of the device, mDNSResponder sends out A and AAAA queries:

```
my-homekit-device-1.local A/AAAA ?
```

The response from the device will include zero or more A and zero or more AAAA records, for example:

```
my-homekit-device-1.local A 192.0.2.17  
my-homekit-device-1.local A 169.254.123.234  
my-homekit-device-1.local AAAA fe80::fedc:1234:6cd1:0c2a
```

With these IP addresses and the port number, the client now knows how to connect to the desired device and use the service. Service discovery is now complete.

Documents/Automatic Discovery of DNS Push Zones.md.

# Exhibit 833-09: Airport Express

## Exemplary Disclosures

### DNSSD Advertising Proxy

The DNSSD Advertising proxy advertises services registered using SRP on one or more links using mDNS. The primary purpose of this proxy is to enable discovery of devices on [stub networks](#).

The advertising proxy works by providing [DNSSD Service Registration Protocol](#) service on some link, typically a stub network link. Hosts on the stub network can offer services that should be discoverable both on the stub network and on the adjacent infrastructure link. To do this, they register their service using the DNSSD Service Registration Protocol.

Once a service has been registered with the advertising proxy, the advertising proxy stores that information in its internal database and then advertises it on the adjacent infrastructure link (typically a home Wi-Fi network) using multicast DNS. Registrations must be periodically renewed; if they are not, then the registration is eventually removed from the database and is no longer advertised using mDNS.

### Documents/advertising-proxy.md.

#### About the mDNSResponder Code

Because Apple benefits more from widespread adoption of Bonjour than it would benefit from keeping Bonjour proprietary, Apple is making this code open so that other developers can use it too.

Because Apple recognises that networks are heterogeneous environments where devices run many different kinds of OS, this code has been made as portable as possible.

A typical mDNS program contains three components:

```
+-----+
| Application |
+-----+
| mDNS Core |
+-----+
| Platform Support |
+-----+
```

The "mDNS Core" layer is absolutely identical for all applications and all Operating Systems.

The "Platform Support" layer provides the necessary supporting routines that are specific to each platform -- what routine do you call to send a UDP packet, what routine do you call to join multicast group, etc.

The "Application" layer does whatever that particular application wants to do. It calls routines provided by the "mDNS Core" layer to perform the functions it needs:

- advertise services,
- browse for named instances of a particular type of service
- resolve a named instance to a specific IP address and port number
- etc.

The "mDNS Core" layer in turn calls through to the "Platform Support" layer to send and receive the multicast UDP packets to do the actual work.

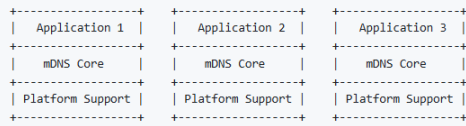
Apple currently provides "Platform Support" layers for macOS, Microsoft Windows, and for POSIX platforms like Linux, Solaris, FreeBSD, etc.

Note: Developers writing applications for OS X do not need to incorporate this code into their applications, since OS X provides a system

## Exhibit 833-09: Airport Express

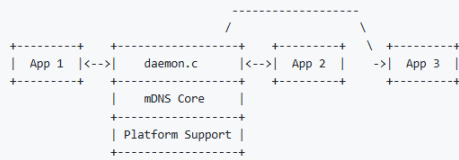
### Exemplary Disclosures

service to handle this for them. If every application developer were to link-in the mDNSResponder code into their application, then we would end up with a situation like the picture below:



This would not be very efficient. Each separate application would be sending their own separate multicast UDP packets and maintaining their own list of answers. Because of this, macOS and POSIX versions of mDNSResponder provide a common system service which client software should access through the "/usr/include/dns\_sd.h" APIs.

The situation on Apple and POSIX platforms looks more like the picture below:



In this configuration, applications make interprocess-communication (IPC) calls to the single mDNSResponder daemon which implements the mDNS and DNS-SD protocols.

Vendors of products such as printers, which are closed environments not expecting to be running third-party application software, can reasonably implement a single monolithic mDNSResponder to advertise all the services of that device. Vendors of open systems which run third-party application software should implement a system service such as the one provided by the OS X mDNSResponder daemon, and application software on that platform should, where possible, make use of that system service instead of embedding their own mDNSResponder.

See ReadMe.txt in the mDNSPosix directory for specific details of building an mDNSResponder on a POSIX Operating System.

Documents/mDNSResponder.md.

See also, generally, GitHub mDNS Documentation.

ServiceRegistration/srp-api.h.

ServiceRegistration/srp-thread.c.

mDNSCore/mDNS.c.

mDNSCore/DNSCommon.h.

mDNSCore/mDNSEmbeddedAPI.h.

See generally, Apple Source Code.

See also, Cheshire at FIGs. 1, 3, 3:10-14, 3:23-26, 3:57-61, 4:11-13, 4:20-23, 4:31-39.

See also, Kearney at FIGs. 1, 11, 2:18-28, 8:11-29, 9:24-33, 9:45-55, 10:24-44, 11:8-12.

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant's cover pleading.

Exemplary Disclosures

**1[f] while in the setup mode, receiving a response to the first message that facilitates establishing an initial communication path with a computing device that is installed with an application for controlling the playback device, wherein the computing device is operating on a secure wireless local area network (WLAN) that is defined by an access point, wherein the initial communication path with the computing device does not traverse the access point;**

Airport Express discloses this feature. For example, the Airport Express receives a response from the computer, e.g., through mDNS message exchange, that facilitates establishing an initial communication path with the Airport Express such as a network with name “Apple Network XXXXXX,” which does not traverse the access point. *See, e.g.,* the following:

Setting Advanced Options

To set advanced options, use AirPort Admin Utility.

You can use AirPort Admin Utility to configure advanced base station settings, such as advanced security options, closed networks, DHCP lease time, access control, WAN privacy, power controls, renaming a USB printer, setting up port mapping, and more.

To set advanced options:

- 1 Choose the wireless network you want to change. On a Macintosh, use the AirPort status menu in the menu bar. On a computer using Windows XP or Windows 2000, hold the pointer over the wireless connection icon until you see your AirPort network name (SSID), and choose it from the list if there are multiple networks available.
- 2 Open AirPort Admin Utility, located in Applications/Utilities on a Macintosh, and in Start > All Programs > AirPort on a computer using Windows XP or Windows 2000.
- 3 If there is more than one base station in the list, select the base station you want to configure. If you don't see the base station you want to configure, click Rescan to scan for available base stations, then select the base station.
- 4 If you are prompted for a password, enter it, then click Configure.

For more information and instructions for using AirPort Admin Utility, see the document “Designing AirPort Networks” or “AirPort Networks for Windows,” located on your AirPort Express CD and at [www.apple.com/airport](http://www.apple.com/airport).

Airport Express Setup Guide at 32.

To return AirPort Express to the factory settings:

- Use the end of a straightened paper clip to press and hold the reset button for ten seconds.

AirPort Express restarts with the following settings:

- AirPort Express receives its IP address using DHCP.
- The network name reverts to Apple Network XXXXXX (where X is a letter or number).
- The AirPort Express password returns to *public*.

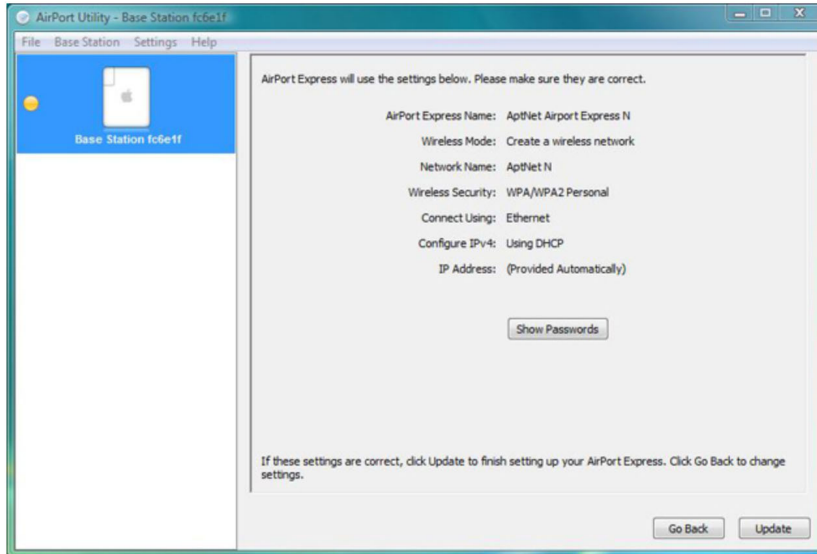
If you used AirPort Admin Utility to create profiles for your AirPort Express, they are preserved when you reset your AirPort Express.

Airport Express Setup Guide at 38.

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

8. The next screen will review your setup information. Click Update. Your Airport Express station has been configured and will now restart. Quit the Airport Utility and connect to your new wireless network.



If you are interested in connecting USB peripherals to your Airport, consult your manual for additional information. Otherwise leave the default settings and click Continue.

## Airport Express Setup Example at 4.

### 4.1 mDNS Service Discovery

With our current mDNS Service Discovery, the process would be:

#### 4.1.1. Determine the domain to browse.

Since the user does not specify the domain in which to look for the `_hap` service, we first need to determine the appropriate domain, which is called the "browsing domain". mDNSResponder maintains a list of browsing domains, one of which is always `.local.`. Other browsing domains can be discovered using the mechanism described in [Section 11 of DNS-Based Service Discovery](#). Since the device is being advertised using multicast DNS on the local network, even if other default browsing domains are configured on that network, the domain in which it can be discovered will be `.local.`

#### 4.1.2. Determine where the query should be sent.

Like the browsing domain, the user does not know (and probably doesn't care) where the query should go. mDNSResponder will attempt to find the service in all of the default browsing domains. Since one of these is `.local.`, which is resolved using multicast DNS, we will send a query for the service to the multicast address ( `224.0.0.251` or `ff02::fb` ).

#### 4.1.3. Find the service instances that are providing the `_hap._udp.` service.

To do that, mDNSResponder sends out a query with the domain and destination we get above with mDNS:

```
_hap._udp.local. PTR ?
```

Each device on the local network that is advertising an instance of the service will respond with an answer for its service:

```
_hap._udp.local. PTR my-homekit-device-1._hap._udp.local.  
_hap._udp.local. PTR my-homekit-device-2._hap._udp.local.
```

Now the user knows that there are two service instances in the network: `my-homekit-device-1._hap._udp.local.` and `my-homekit-device-2._hap._udp.local.`. Suppose the user chooses `my-homekit-device-1._hap._udp.local.`

#### 4.1.4. Resolve the service instance.

mDNSResponder will then send out a query using mDNS, for the service instance name chosen by user:

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

```
my-homekit-device-1._hap._udp.local. SRV ?
```



The response will be the host name of the device, and the port number on which the service is available on that device:

```
my-homekit-device-1._hap._udp.local. SRV my-homekit-device-1.local 12345
```



#### 4.1.5. Resolve the local host name and connect to it.

To find the address of the device, mDNSResponder sends out A and AAAA queries:

```
my-homekit-device-1.local A/AAAA ?
```



The response from the device will include zero or more A and zero or more AAAA records, for example:

```
my-homekit-device-1.local A 192.0.2.17  
my-homekit-device-1.local A 169.254.123.234  
my-homekit-device-1.local AAAA fe80::fedc:1234:6cd1:0c2a
```



With these IP addresses and the port number, the client now knows how to connect to the desired device and use the service. Service discovery is now complete.

## Documents/Automatic Discovery of DNS Push Zones.md.

### DNSSD Advertising Proxy

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## Documents/advertising-proxy.md.

# Exhibit 833-09: Airport Express

## Exemplary Disclosures

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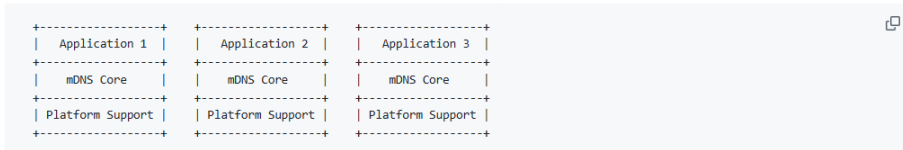
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service to handle this for them. If every application developer were to link-in the mDNSResponder code into their application, then we would end up with a situation like the picture below:



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See ReadMe.txt in the mDNSPosix directory for specific details of building an mDNSResponder on a POSIX Operating System.

Documents/mDNSResponder.md.

Exemplary Disclosures

OpenThread Stub Network Border Router

The OpenThread Stub Network Border Router (henceforth "BR") consists of three parts: OpenThread itself, the Service Registration Protocol Advertising Proxy, and the OpenThread Stub Network Border Router management system, which is currently included as part of the Advertising Proxy.

Currently the BR is known to work on Raspbian Buster on the Raspberry Pi 4. It should also be possible to make it work on OpenWRT and other Linux installations. No BSD installations have been attempted yet. If you wish to set up a BR for your own use, your best way forward is to get a Raspberry Pi 4. Instructions for setting up a BR on a Raspberry Pi are included below.

The BR connects to one or more infrastructure networks using either or both of its Ethernet and Wi-Fi network interfaces. Additional infrastructure link connections can be established either using additional USB Ethernet adapters, additional USB Wi-Fi adapters, or VLANs. Most applications will only need a single infrastructure connection.

The BR requires one or more Thread devices to be connected in order to form a Thread mesh. If no Thread devices are present, no Thread mesh will form, and the BR will not advertise routes nor start the SRP Advertising Proxy.

Documents/openthread-border-router.md.

See generally, GitHub mDNS Documentation.

ServiceRegistration/srp-api.h.

ServiceRegistration/srp-thread.c.

mDNSScore/mDNS.c.

mDNSScore/DNSCommon.h.

mDNSScore/mDNSEmbeddedAPI.h.

See generally, Apple Source Code.

“The third zero configuration protocol area is service discovery. Clients should be able to discover services on the network without prior configuration, and without any administered configuration management services (such as directories) on the network. Furthermore, the service discovery protocol must not cause broadcast storms or other unscalable behavior. (Some existing service discovery protocols—most notably the Service Advertising Protocol from the IPX protocol suite—require inordinate network resources.)”

“The fourth protocol area the working group identified is multicast address allocation. Some multicast-based applications need to obtain a unique multicast address to prevent other applications (or sessions based on the same application) from conflicting with them. A multicast address conflict can cause applications to fail in an analogous way to two hosts configured with the same IP address: Communication from the two distinct sessions could be delivered to incorrect destinations.

The zeroconf multicast address allocation protocol (ZMAAP)<sup>12</sup> allows applications to

- allocate unique addresses and maintain them over time;

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

- prevent reallocation of assigned addresses; and
- be notified of multicast allocation collision.”

Guttman at 84-85.

*See also*, IETF Zeroconf.

For example, the computer is installed with an application for controlling the Airport Express, such as the Airport Setup Assistant, Airport Admin Utility, Airport status menu, etc.

#### About the AirPort Software

AirPort Express works with the AirPort software included on the AirPort Express CD.



##### AirPort Setup Assistant

Use the AirPort Setup Assistant (or the AirPort Express Assistant if you are using Windows XP) to set up your AirPort Express to connect to the Internet, play iTunes music on your home stereo or powered speakers, and share a printer. You can also bridge your AirPort Express to your existing AirPort Extreme or AirPort Express wireless network to extend the range of your network (WDS).



##### AirPort Admin Utility

AirPort Admin Utility is an advanced tool for setting up and managing AirPort Extreme and AirPort Express base stations. Use AirPort Admin Utility to adjust network, routing, and security settings and other advanced options.



##### AirPort status menu in the menu bar

Use the AirPort status menu to switch quickly between AirPort networks, monitor the signal quality of the current network, create a Computer-to-Computer network, and turn AirPort on and off. The status menu is available on computers using Mac OS X.

#### What You Need to Get Started

To set up AirPort Express using a Macintosh, you must have the following:

- A Macintosh computer with an AirPort or AirPort Extreme Card installed
- Mac OS X v10.3 or later
- iTunes 4.7 (included on the AirPort Express CD) or later

To set up AirPort Express using a Windows PC, you must have the following:

- A Windows PC with 300 MHz or higher processor speed
- Windows XP Home or Professional
- iTunes 4.7 for Windows (included on the AirPort Express CD) or later

You need iTunes 4.6 or later to play audio from your computer to a stereo connected to AirPort Express. To be sure you have the latest version of iTunes, go to [www.apple.com/itunes](http://www.apple.com/itunes).

You can use AirPort Express with any wireless-enabled computer that is compliant with the IEEE 802.11b or 802.11g standards. To set up AirPort Express, your computer must meet the requirements listed above.

**Note:** If you are using Windows 2000, use AirPort Admin Utility for Windows to set up your AirPort Express. The AirPort Express Assistant is not compatible with Windows 2000.

Airport Express Setup Guide at 7-8.

### Exemplary Disclosures

This chapter provides information and instructions for using the AirPort Express software to set up your AirPort Express.

Use the diagrams in the previous chapter to help you decide where you want to use your AirPort Express, and what features you want to set up on your AirPort network. Then use the instructions in this chapter to easily configure AirPort Express and set up your AirPort network.

AirPort Express software lets you:

- Set up a new network that wireless computers can use to communicate with each other. If you set up your AirPort Express as a base station and connect it to the Internet, wireless computers can also share the Internet connection.
- Connect your AirPort Express to your existing wireless network and use iTunes to play iTunes music on your home stereo or powered speakers, and connect a USB printer to share.
- Connect your AirPort Express to your existing AirPort Extreme or AirPort Express network and extend the range of your wireless network using the AirPort Express as a wireless bridge. This is known as a WDS (Wireless Distribution System).

You can use iTunes to play music from iTunes and share a USB printer in any type of network you set up, whether it is a new network or you are joining an existing network.

If you have more than one AirPort Express, you can connect one to the stereo in your living room and connect another to the powered speakers in your den. Using iTunes, you can stream your iTunes music to either AirPort Express, depending on where you are in your house. Choose the name of the AirPort Express you want to use from the speakers pop-up menu in iTunes.

This chapter provides an overview for using the AirPort Express Assistant to set up your network and other features of your AirPort Express. For more detailed wireless networking information, and for information about the advanced features of AirPort, refer to the document "Designing AirPort Networks," or "AirPort Networks for Windows," located on the AirPort Express CD, and at [www.apple.com/airportextreme](http://www.apple.com/airportextreme).

You can do most of your network setup and configuration tasks with the AirPort Setup Assistant for Mac OS X and the AirPort Express Assistant for Windows XP. To set advanced options, you need to use AirPort Admin Utility. See "Setting Advanced Options" on page 32.

**Note:** If you are using Windows 2000, use AirPort Admin Utility for Windows to set up your AirPort Express. The AirPort Express Assistant is not compatible with Windows 2000.

#### Using the AirPort Setup Assistant or the AirPort Express Assistant

To set up and configure your AirPort Express to use AirPort for wireless networking and Internet access, use the AirPort Setup Assistant for Mac OS X, or the AirPort Express Assistant for Windows XP. (The assistant is installed on your computer when you install the software on the AirPort Express CD.)

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

On a Macintosh computer using Mac OS X v10.3 or later:

- Open the AirPort Setup Assistant, located in Applications/Utilities, and follow the onscreen instructions.

On a computer using Windows XP:

- Open the AirPort Express Assistant, located in Start > All Programs > AirPort Express Assistant.



You will be asked a series of questions about the type of network you want to use and the services you want to set up. The AirPort Setup Assistant or AirPort Express Assistant helps you enter the appropriate settings for the network you are setting up.

Airport Express Setup Guide at 26-28.

#### Connecting to an Existing Wireless Network

You can use the AirPort Express Assistant to join an existing wireless network. When you connect your AirPort Express to your home stereo, computers on your wireless network can use AirTunes to play music on the stereo from iTunes. If you connect a USB printer to your AirPort Express, all of the computers on the network can print to it.

Be sure to connect the audio cable to your stereo and the USB cable to your printer before you use the AirPort Express Assistant.

- Open the AirPort Setup Assistant, located in Applications/Utilities on a Macintosh, or the AirPort Express Assistant, located in Start > All Programs > AirPort on a computer using Windows XP. Follow the onscreen instructions to connect your AirPort Express to your wireless network.

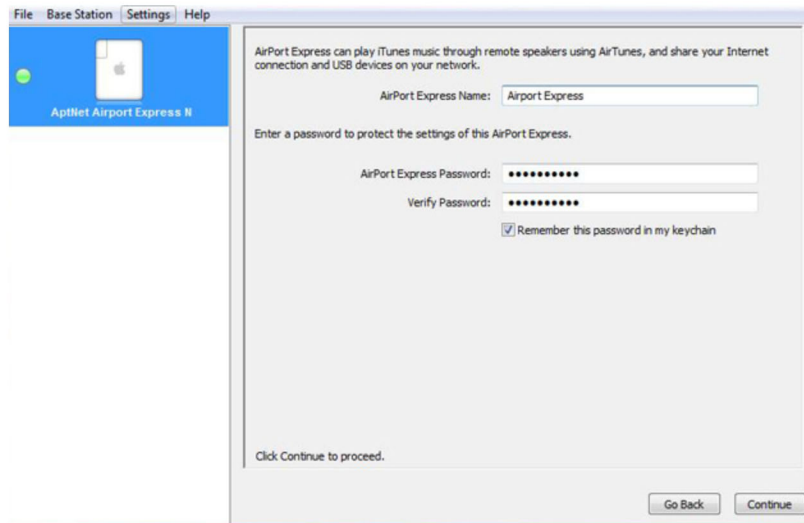
Airport Express Setup Guide at 31.

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

#### Apple Airport Express

1. To set up and configure your AirPort Express to use AirPort for wireless networking and Internet access, use the AirPort Setup Assistant for Mac OS X, or the AirPort Express Assistant for Windows XP. (The assistant is installed on your computer when you install the software on the AirPort Express CD or you can also download it from [Apple](#).)
2. After unpacking your Airport Express, connect the ethernet cable from your jack to the ethernet port on the Airport Express. Plug the AC adapter into an electrical outlet.
3. Open the AirPort Setup Assistant, located in Applications/Utilities on a Macintosh, or the AirPort Express Assistant, located in Start > All Programs > AirPort on a computer using Windows XP. Follow the onscreen instructions to configure and share Internet access on your AirPort Express.
4. Enter a Base Station Name and Password click Continue. Write these names down for future reference.



Airport Express Setup Example at 1.

*See generally, Apple Source Code.*

For example, the computer is operating on the secure WLAN.

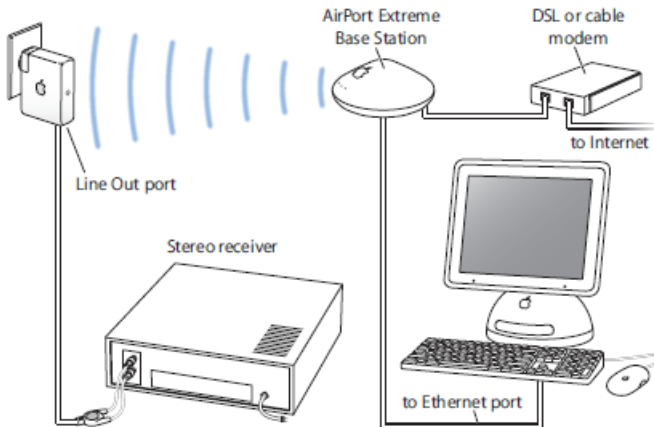
## Exhibit 833-09: Airport Express

### Exemplary Disclosures

#### Using AirPort Express on an Existing Wireless Network to Stream Music to Your Home Stereo

You can also connect AirPort Express to a wireless network and use iTunes to play music on your stereo from iTunes. Connecting AirPort Express to your existing network allows you to place AirPort Express in another room, within range of your network.

#### What It Looks Like



Airport Express Setup Guide at 17.

See also, Cheshire at FIGs. 1, 3, 3:18-29, 4:59-65.

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant's cover pleading.

**1[g] receiving, from the computing device via the initial communication path, at least a second message containing network configuration parameters for the secure WLAN, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN;**

Airport Express discloses this feature. For example, the Airport Express receives from the computer via the initial communication path containing network configuration parameters for the secure WLAN. The network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN. See, e.g., the following:

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

#### Connecting to an Existing Wireless Network

You can use the AirPort Express Assistant to join an existing wireless network. When you connect your AirPort Express to your home stereo, computers on your wireless network can use iTunes to play music on the stereo from iTunes. If you connect a USB printer to your AirPort Express, all of the computers on the network can print to it.

Be sure to connect the audio cable to your stereo and the USB cable to your printer before you use the AirPort Express Assistant.

- Open the AirPort Setup Assistant, located in Applications/Utilities on a Macintosh, or the AirPort Express Assistant, located in Start > All Programs > AirPort on a computer using Windows XP. Follow the onscreen instructions to connect your AirPort Express to your wireless network.

#### Airport Express Setup Guide at 31.

#### Commissioning a Thread Device to the Thread Network

The Border router has now initiated a Thread Network. To connect a Thread Device to the Thread Network you must provide the device with Thread Network Credentials. This may be done by:

- **Static Commissioning.** The accessory may be built with pre-determined Thread Network Credentials.
- **Joiner Mode.** The accessory may be built such that it boots into 'Joiner Mode'. An accessory in Joiner Mode must be manually commissioned by a node on the Thread Network (In this case the Border Router). See [OpenThread](#) for details.

#### Commissioning a Thread Accessory Statically

The accessory may be built to launch "just knowing" its Thread Network Credentials. This option must be used only for the convenience of testing the device over Thread without having to commission using Thread joiner mode.

The details for how to do static commissioning will be specific to your thread accessory's development environment. You will have to set thread commissioning parameters, likely in a header file, something like this (assuming the example network parameters we used above in `OT_CTL_SCRIPT`):

```
#ifndef THREAD_PANID
#define THREAD_PANID 43981
#endif
#ifndef THREAD_EXTPANID
#define THREAD_EXTPANID 0xDEAD00BEEF00CAFEu11
#endif
#ifndef THREAD_CHANNEL
#define THREAD_CHANNEL 11
#endif
#ifndef THREAD_MASTERKEY_UPPER64
#define THREAD_MASTERKEY_UPPER64 0x0011223344556677u11
#endif
#ifndef THREAD_MASTERKEY_LOWER64
#define THREAD_MASTERKEY_LOWER64 0x8899AABBCCDDEEFFu11
#endif
```

Note: PANID is decimal, not hex. 43981 corresponds to 0xabcd

- Compile the accessory for static commissioning (your Thread accessory development platform may have build parameters that must be set for static commissioning).

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

#### Commissioning a Thread Device using Joiner Mode

When the Thread accessory is built without static commissioning, it will automatically boot into [Joiner Mode](#). Joiner Mode is when a Thread accessory is actively searching for a Thread mesh to join. The Thread mesh must be told to accept a Joiner.

- When the accessory is in Joiner Mode, it will periodically report its **EUI** and **Joiner Passphrase**. Make a note of these. For accessories built with a CLI, it may be necessary to query the CLI for the EUI and Joiner passphrase.
- Launch `ot-ctl` at the border router. From the OpenThread root directory:

```
sudo output/posix/armv7l-unknown-linux-gnueabi/hf/bin/ot-ctl
```

- Initialize the commissioner

```
> commissioner start
Commissioner: petitioning
Done
> Commissioner: active
```

- Tell the commissioner to accept the joiner with EUI and Passphrase

```
> commissioner joiner add <EUI> <PASSPHRASE>
Done
```

for example:

```
> commissioner joiner add F4CE366B04F7D4DF 6D8E3F0A99C2D399A334619304800804
Done
```

Note: you may replace the EUI with `*` to accept all joiners with the appropriate passphrase.

- After a few minutes the accessory will be allowed into the Thread Network by the Border Router, receive its commissioning credentials, and, if it implements an SRP client, will register with `srp-mdns-proxy`.

[Documents/openthread-border-router.md](#).

*See generally*, [GitHub mDNS Documentation](#).

[ServiceRegistration/srp-api.h](#).

[ServiceRegistration/srp-thread.c](#).

[mDNSSCore/mDNS.c](#).

[mDNSSCore/DNSCommon.h](#).

[mDNSSCore/mDNSEmbeddedAPI.h](#).

*See generally*, [Apple Source Code](#).

For example, the computer is or can be configured to invoke Apple system functions and APIs such as `SCNetworkConfiguration` to store and retrieve network configuration parameters and use the parameters to configure network devices.

## Exemplary Disclosures

[System Configuration](#) / [SCNetworkConfiguration](#)

API Collection

### SCNetworkConfiguration

#### Overview

The `SCNetworkConfiguration` programming interface provides access to the stored network configuration. The functions include providing access to the network-capable devices on the system, the network sets, network services, and network protocols. Note that these functions follow Core Foundation function-name conventions. A function that has "Create" or "Copy" in its name returns a reference you must release with the [CFRelease](#) function.

Note that when using the functions in this programming interface, you must call the [SCPreferencesCommitChanges](#) function to ensure that your changes are committed to permanent storage.

[System Configuration](#) / [SCNetworkServiceCreate](#)

Function

### SCNetworkServiceCreate

Creates a new network service for the specified interface in the configuration.

macOS 10.4+

```
SCNetworkServiceRef SCNetworkServiceCreate(SCPreferencesRef prefs, SCNetworkInterfaceRef interface);
```

#### Parameters

`prefs`

The preferences session.

`interface`

The network interface for which to create the new service.

#### Return Value

The new network service. You must release the returned value.

#### See Also

##### Configuring Network Services

[SCNetworkServiceAddProtocolType](#)

Adds the network protocol of the specified type to the specified service.

# Exhibit 833-09: Airport Express

## Exemplary Disclosures

[System Configuration](#) / `SCPreferencesCreate`

Function

### SCPreferencesCreate

Initiates access to the per-system set of configuration preferences.

macOS 10.1+

```
SCPreferencesRef SCPreferencesCreate(CFAllocatorRef allocator, CFStringRef name, CFStringRef prefsID);
```

### Parameters

**allocator**

The allocator to use to allocate memory for this preferences session. If the value is not a valid `CFAllocator`, the behavior is undefined. Pass `NULL` or `kCFAllocatorDefault` to use the current default `CFAllocator`.

**name**

The name of the calling process.

**prefsID**

The name of the group of preferences to be accessed or updated. A name that starts with a leading `/` character specifies the absolute path to the file containing the preferences to be accessed. A name that does not start with a leading `/` character specifies a file relative to the default system preferences directory.

To access the default system preferences, pass in `NULL`.

### Return Value

A reference to the new preferences session. You must release the returned value.

## Exemplary Disclosures

[System Configuration](#) / SCNetworkServiceGetName

Function

### SCNetworkServiceGetName

Returns the user-specified name associated with the specified service.

macOS 10.4+

```
NSStringRef SCNetworkServiceGetName(SCNetworkServiceRef service);
```

### Parameters

`service`  
The network service.

### Return Value

The user-specified name associated with the service.

### See Also

#### Configuring Network Services

[SCNetworkServiceAddProtocolType](#)  
Adds the network protocol of the specified type to the specified service.

[SCNetworkServiceCopy](#)  
Returns the network service with the specified identifier.

[SCNetworkServiceCopyAll](#)

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

[System Configuration](#) / SCNetworkServiceSetName

Function

## SCNetworkServiceSetName

Stores the user-specified name for the specified service.

macOS 10.4+

```
Boolean SCNetworkServiceSetName(SCNetworkServiceRef service, CFStringRef name);
```

### Parameters

`service`

The network service.

`name`

The user-defined name to associate with the service.

### Return Value

TRUE if the name was saved; FALSE if an error occurred.

### Discussion

Although it is not technically required, the user-specified names for all services within any given set should be unique. For this reason, an error will be returned if you attempt to name two services with the same string.

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

[System Configuration](#) / `SCNetworkSetCopyCurrent`

Function

## SCNetworkSetCopyCurrent

Returns the current set.

macOS 10.4+

```
SCNetworkSetRef SCNetworkSetCopyCurrent(SCPreferencesRef prefs);
```

### Parameters

`prefs`

The preferences session.

### Return Value

The current set, or NULL if no current set has been defined.

### See Also

#### Configuring Network Sets

[SCNetworkSetAddService](#)

Adds the specified network service to the specified set.

[SCNetworkSetContainsInterface](#)

Apple Network Configuration API.

*See also*, Cheshire at FIGs. 2, 3, 1:37-45, 3:45-56, 4:53-58.

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant's cover pleading.

**1[h] using the network configuration parameters to connect to the secure WLAN that is defined by the access point; and**

Airport Express discloses this feature. For example, the Airport Express uses the network configuration parameters to connect to the secure WLAN that is defined by the access point. *See, e.g.*, the following:

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

When you plug AirPort Express into the wall, the status light flashes green and then glows amber while it starts up. Once it has started up completely, the status light glows solid green.

#### AirPort Express Status Lights

The following table explains AirPort Express light sequences and what they indicate.

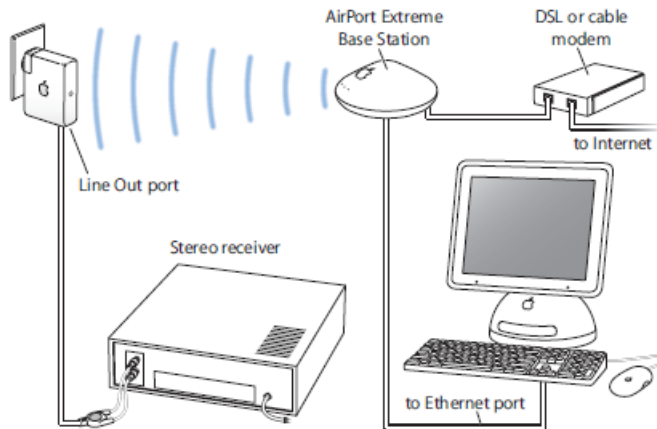
Light	Status/description
Off	AirPort Express is unplugged.
Flashing green	AirPort Express is starting up. <i>Note:</i> If you choose Flash On Activity from the Status Light pop-up menu in the Base Station pane of AirPort Admin Utility, the status light may flash green to indicate normal activity.
Solid green	AirPort Express is on and working properly. If you choose Flash On Activity from the Status Light pop-up menu in the Base Station pane of AirPort Admin Utility, the status light may flash green to indicate normal activity.
Flashing amber	AirPort Express cannot establish a connection to the network or the Internet. See "Your AirPort Express Status Light Flashes Amber" on page 38.
Solid amber	AirPort Express is completing its startup sequence.
Flashing amber and green	There may be a problem starting up. AirPort Express will restart and try again.

Airport Express Setup Guide at 10.

#### Using AirPort Express on an Existing Wireless Network to Stream Music to Your Home Stereo

You can also connect AirPort Express to a wireless network and use iTunes to play music on your stereo from iTunes. Connecting AirPort Express to your existing network allows you to place AirPort Express in another room, within range of your network.

#### What It Looks Like



Airport Express Setup Guide at 17.

### Exemplary Disclosures

This chapter provides information and instructions for using the AirPort Express software to set up your AirPort Express.

Use the diagrams in the previous chapter to help you decide where you want to use your AirPort Express, and what features you want to set up on your AirPort network. Then use the instructions in this chapter to easily configure AirPort Express and set up your AirPort network.

AirPort Express software lets you:

- Set up a new network that wireless computers can use to communicate with each other. If you set up your AirPort Express as a base station and connect it to the Internet, wireless computers can also share the Internet connection.
- Connect your AirPort Express to your existing wireless network and use iTunes to play iTunes music on your home stereo or powered speakers, and connect a USB printer to share.
- Connect your AirPort Express to your existing AirPort Extreme or AirPort Express network and extend the range of your wireless network using the AirPort Express as a wireless bridge. This is known as a WDS (Wireless Distribution System).

You can use iTunes to play music from iTunes and share a USB printer in any type of network you set up, whether it is a new network or you are joining an existing network.

If you have more than one AirPort Express, you can connect one to the stereo in your living room and connect another to the powered speakers in your den. Using iTunes, you can stream your iTunes music to either AirPort Express, depending on where you are in your house. Choose the name of the AirPort Express you want to use from the speakers pop-up menu in iTunes.

This chapter provides an overview for using the AirPort Express Assistant to set up your network and other features of your AirPort Express. For more detailed wireless networking information, and for information about the advanced features of AirPort, refer to the document "Designing AirPort Networks," or "AirPort Networks for Windows," located on the AirPort Express CD, and at [www.apple.com/airportextreme](http://www.apple.com/airportextreme).

You can do most of your network setup and configuration tasks with the AirPort Setup Assistant for Mac OS X and the AirPort Express Assistant for Windows XP. To set advanced options, you need to use AirPort Admin Utility. See "Setting Advanced Options" on page 32.

**Note:** If you are using Windows 2000, use AirPort Admin Utility for Windows to set up your AirPort Express. The AirPort Express Assistant is not compatible with Windows 2000.

#### Using the AirPort Setup Assistant or the AirPort Express Assistant

To set up and configure your AirPort Express to use AirPort for wireless networking and Internet access, use the AirPort Setup Assistant for Mac OS X, or the AirPort Express Assistant for Windows XP. (The assistant is installed on your computer when you install the software on the AirPort Express CD.)

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

On a Macintosh computer using Mac OS X v10.3 or later:

- Open the AirPort Setup Assistant, located in Applications/Utilities, and follow the onscreen instructions.

On a computer using Windows XP:

- Open the AirPort Express Assistant, located in Start > All Programs > AirPort Express Assistant.



You will be asked a series of questions about the type of network you want to use and the services you want to set up. The AirPort Setup Assistant or AirPort Express Assistant helps you enter the appropriate settings for the network you are setting up.

Airport Express Setup Guide at 26-28.

#### Connecting to an Existing Wireless Network

You can use the AirPort Express Assistant to join an existing wireless network. When you connect your AirPort Express to your home stereo, computers on your wireless network can use iTunes to play music on the stereo from iTunes. If you connect a USB printer to your AirPort Express, all of the computers on the network can print to it.

Be sure to connect the audio cable to your stereo and the USB cable to your printer before you use the AirPort Express Assistant.

- Open the AirPort Setup Assistant, located in Applications/Utilities on a Macintosh, or the AirPort Express Assistant, located in Start > All Programs > AirPort on a computer using Windows XP. Follow the onscreen instructions to connect your AirPort Express to your wireless network.

Airport Express Setup Guide at 31.

See also, Cheshire at FIGs. 2, 3, 1:37-45, 3:45-56, 4:53-58.

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant's cover pleading.

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

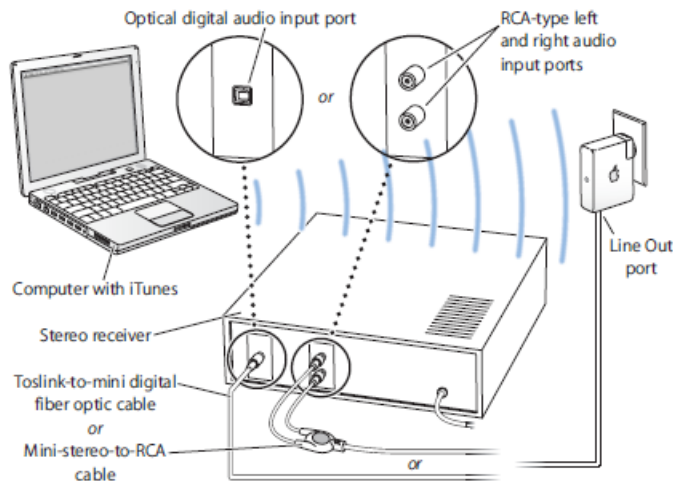
**1[i] transitioning from communicating with the computing device via the initial communication path to communicating with the computing device via the secure WLAN that is defined by the access point.**

Airport Express discloses this feature. For example, the Airport Express Audio Receiver disconnects the USB connection with the computer and transitions to communicating with the computer via the secure WLAN that is defined by the access point. For example, the Airport Express communicates with the computer via the secure WLAN and plays music files. *See, e.g.*, the following:

#### Using AirPort Express With AirTunes to Play iTunes Music on Your Stereo

You can connect your AirPort Express to your stereo with a Toslink-to-mini digital fiber optic cable or a mini-stereo-to-dual-RCA cable, and use AirTunes to wirelessly play music from iTunes.

##### What It Looks Like



##### How to Set It Up

- 1 Connect your AirPort Express to your home stereo or powered speakers using a digital fiber optic cable or analog mini-stereo-to-dual-RCA connected to the stereo mini-jack (Ⓜ).
- Note:** You cannot use powered USB speakers with AirPort Express. Use only powered speakers with a stereo mini-jack connector.
- 2 Use the AirPort Setup Assistant for Mac OS X or the AirPort Express Assistant for Windows XP to create a new network. (See page 26 for more information.)
  - 3 Open iTunes on your computer and choose your stereo or speakers from the speakers pop-up menu in the lower right of the iTunes window.

Wireless computers within range of AirPort Express can wirelessly stream music to it using iTunes 4.6 or later. Only one computer at a time can stream music to AirPort Express. You cannot stream music to more than one AirPort Express at a time.

**Note:** Do not connect AirPort Express to the phono jack on your stereo.

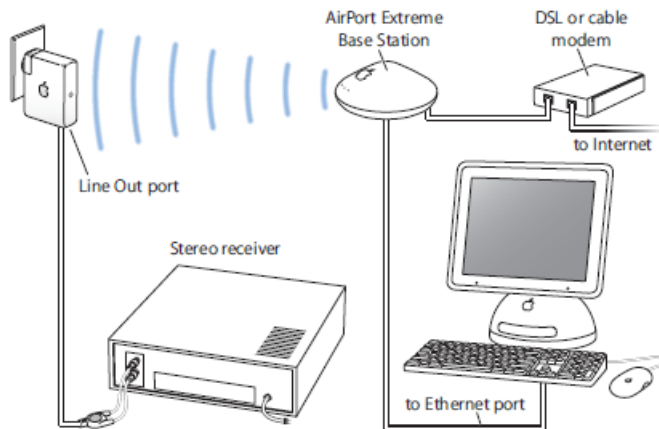
## Exhibit 833-09: Airport Express

### Exemplary Disclosures

#### Using AirPort Express on an Existing Wireless Network to Stream Music to Your Home Stereo

You can also connect AirPort Express to a wireless network and use iTunes to play music on your stereo from iTunes. Connecting AirPort Express to your existing network allows you to place AirPort Express in another room, within range of your network.

#### What It Looks Like



Airport Express Setup Guide at 15-17.

#### This chapter provides information and instructions for using the AirPort Express software to set up your AirPort Express.

Use the diagrams in the previous chapter to help you decide where you want to use your AirPort Express, and what features you want to set up on your AirPort network. Then use the instructions in this chapter to easily configure AirPort Express and set up your AirPort network.

AirPort Express software lets you:

- Set up a new network that wireless computers can use to communicate with each other. If you set up your AirPort Express as a base station and connect it to the Internet, wireless computers can also share the Internet connection.
- Connect your AirPort Express to your existing wireless network and use iTunes to play iTunes music on your home stereo or powered speakers, and connect a USB printer to share.
- Connect your AirPort Express to your existing AirPort Extreme or AirPort Express network and extend the range of your wireless network using the AirPort Express as a wireless bridge. This is known as a WDS (Wireless Distribution System).

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

You can use iTunes to play music from iTunes and share a USB printer in any type of network you set up, whether it is a new network or you are joining an existing network.

If you have more than one AirPort Express, you can connect one to the stereo in your living room and connect another to the powered speakers in your den. Using iTunes, you can stream your iTunes music to either AirPort Express, depending on where you are in your house. Choose the name of the AirPort Express you want to use from the speakers pop-up menu in iTunes.

This chapter provides an overview for using the AirPort Express Assistant to set up your network and other features of your AirPort Express. For more detailed wireless networking information, and for information about the advanced features of AirPort, refer to the document "Designing AirPort Networks," or "AirPort Networks for Windows," located on the AirPort Express CD, and at [www.apple.com/airportextreme](http://www.apple.com/airportextreme).

You can do most of your network setup and configuration tasks with the AirPort Setup Assistant for Mac OS X and the AirPort Express Assistant for Windows XP. To set advanced options, you need to use AirPort Admin Utility. See "Setting Advanced Options" on page 32.

**Note:** If you are using Windows 2000, use AirPort Admin Utility for Windows to set up your AirPort Express. The AirPort Express Assistant is not compatible with Windows 2000.

#### Using the AirPort Setup Assistant or the AirPort Express Assistant

To set up and configure your AirPort Express to use AirPort for wireless networking and Internet access, use the AirPort Setup Assistant for Mac OS X, or the AirPort Express Assistant for Windows XP. (The assistant is installed on your computer when you install the software on the AirPort Express CD.)

Airport Express Setup Guide at 26-27.

*See also*, Cheshire at FIG. 3, 4:66-5:2.

*See also*, Kearney at FIG. 11, 2:18-28, 8:11-29, 9:24-33, 9:45-55, 10:24-33, 10:38-44, 11:8-12.

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant's cover pleading.

### **2. The playback device of claim 1, wherein the triggering event comprises one of (a) powering on the playback device or (b) receiving user input via a physical interface of the playback device.**

Airport Express discloses this feature. For example, the triggering event can be powering on the Airport Express. *See, e.g.*, the following:

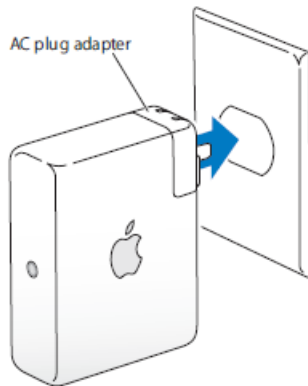
## Exhibit 833-09: Airport Express

### Exemplary Disclosures

#### Plugging In AirPort Express

Before you plug in your AirPort Express, first connect the appropriate cables to the ports you want to use, including the Ethernet cable connected to your DSL or cable modem (if you will connect to the Internet), the audio cable connected to your stereo (if you will use iTunes to play music from iTunes) and a USB cable connected to a compatible USB printer (if you will print to a USB printer).

Once you have connected the cables for all the devices you plan to use, connect the AC plug adapter if necessary. Plug AirPort Express into the wall. There is no on switch.



When you plug AirPort Express into the wall, the status light flashes green and then glows amber while it starts up. Once it has started up completely, the status light glows solid green.

#### AirPort Express Status Lights

The following table explains AirPort Express light sequences and what they indicate.

Light	Status/description
Off	AirPort Express is unplugged.
Flashing green	AirPort Express is starting up. <i>Note:</i> If you choose Flash On Activity from the Status Light pop-up menu in the Base Station pane of AirPort Admin Utility, the status light may flash green to indicate normal activity.
Solid green	AirPort Express is on and working properly. If you choose Flash On Activity from the Status Light pop-up menu in the Base Station pane of AirPort Admin Utility, the status light may flash green to indicate normal activity.
Flashing amber	AirPort Express cannot establish a connection to the network or the Internet. See "Your AirPort Express Status Light Flashes Amber" on page 38.
Solid amber	AirPort Express is completing its startup sequence.
Flashing amber and green	There may be a problem starting up. AirPort Express will restart and try again.

Airport Express Setup Guide at 9-10.

See also, Cheshire at 4:10-15, 5:9-22.

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant's cover pleading.

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

**4. The playback device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:**

**after receiving the second message, providing an indication that the playback device has successfully received the network configuration parameters for the secure WLAN.**

Airport Express discloses this feature. For example, the Airport Express further comprises program instructions stored on the non-transitory computer-readable medium that, when executed by the processor, cause the Airport Express to perform functions comprising: after receiving the second message, providing an indication that the media adapter has successfully received the network configuration parameters for the secure WLAN, such as through mDNS discovery service message exchange. *See, e.g.*, the following:

#### 4.1 mDNS Service Discovery

With our current mDNS Service Discovery, the process would be:

##### 4.1.1. Determine the domain to browse.

Since the user does not specify the domain in which to look for the `_hap` service, we first need to determine the appropriate domain, which is called the "browsing domain". mDNSResponder maintains a list of browsing domains, one of which is always `'local.'`. Other browsing domains can be discovered using the mechanism described in [Section 11 of DNS-Based Service Discovery](#). Since the device is being advertised using multicast DNS on the local network, even if other default browsing domains are configured on that network, the domain in which it can be discovered will be `.local.`

##### 4.1.2. Determine where the query should be sent.

Like the browsing domain, the user does not know (and probably doesn't care) where the query should go. mDNSResponder will attempt to find the service in all of the default browsing domains. Since one of these is `'local.'`, which is resolved using multicast DNS, we will send a query for the service to the multicast address (`224.0.0.251` or `ff02::fb`).

##### 4.1.3. Find the service instances that are providing the `_hap._udp` service.

To do that, mDNSResponder sends out a query with the domain and destination we get above with mDNS:

```
_hap._udp.local. PTR ?
```

Each device on the local network that is advertising an instance of the service will respond with an answer for its service:

```
_hap._udp.local. PTR my-homekit-device-1._hap._udp.local.  
_hap._udp.local. PTR my-homekit-device-2._hap._udp.local.
```

Now the user knows that there are two service instances in the network: `my-homekit-device-1._hap._udp.local.` and `my-homekit-device-2._hap._udp.local.` Suppose the user chooses `my-homekit-device-1._hap._udp.local.`

##### 4.1.4. Resolve the service instance.

mDNSResponder will then send out a query using mDNS, for the service instance name chosen by user:

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

```
my-homekit-device-1._hap._udp.local. SRV ?
```



The response will be the host name of the device, and the port number on which the service is available on that device:

```
my-homekit-device-1._hap._udp.local. SRV my-homekit-device-1.local 12345
```



#### 4.1.5. Resolve the local host name and connect to it.

To find the address of the device, mDNSResponder sends out A and AAAA queries:

```
my-homekit-device-1.local A/AAAA ?
```



The response from the device will include zero or more A and zero or more AAAA records, for example:

```
my-homekit-device-1.local A 192.0.2.17  
my-homekit-device-1.local A 169.254.123.234  
my-homekit-device-1.local AAAA fe80::fedc:1234:6cd1:0c2a
```



With these IP addresses and the port number, the client now knows how to connect to the desired device and use the service. Service discovery is now complete.

## Documents/Automatic Discovery of DNS Push Zones.md.

### DNSSD Advertising Proxy

The DNSSD Advertising proxy advertises services registered using SRP on one or more links using mDNS. The primary purpose of this proxy is to enable discovery of devices on [stub networks](#).

The advertising proxy works by providing [DNSSD Service Registration Protocol](#) service on some link, typically a stub network link. Hosts on the stub network can offer services that should be discoverable both on the stub network and on the adjacent infrastructure link. To do this, they register their service using the DNSSD Service Registration Protocol.

Once a service has been registered with the advertising proxy, the advertising proxy stores that information in its internal database and then advertises it on the adjacent infrastructure link (typically a home Wi-Fi network) using multicast DNS. Registrations must be periodically renewed; if they are not, then the registration is eventually removed from the database and is no longer advertised using mDNS.

## Documents/advertising-proxy.md.

# Exhibit 833-09: Airport Express

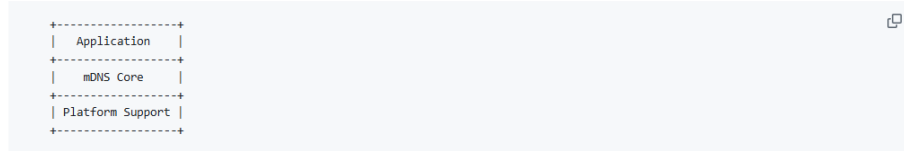
## Exemplary Disclosures

### About the mDNSResponder Code

Because Apple benefits more from widespread adoption of Bonjour than it would benefit from keeping Bonjour proprietary, Apple is making this code open so that other developers can use it too.

Because Apple recognises that networks are heterogeneous environments where devices run many different kinds of OS, this code has been made as portable as possible.

A typical mDNS program contains three components:



The "mDNS Core" layer is absolutely identical for all applications and all Operating Systems.

The "Platform Support" layer provides the necessary supporting routines that are specific to each platform -- what routine do you call to send a UDP packet, what routine do you call to join multicast group, etc.

The "Application" layer does whatever that particular application wants to do. It calls routines provided by the "mDNS Core" layer to perform the functions it needs:

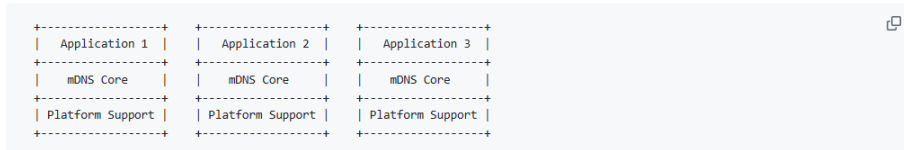
- advertise services,
- browse for named instances of a particular type of service
- resolve a named instance to a specific IP address and port number
- etc.

The "mDNS Core" layer in turn calls through to the "Platform Support" layer to send and receive the multicast UDP packets to do the actual work.

Apple currently provides "Platform Support" layers for macOS, Microsoft Windows, and for POSIX platforms like Linux, Solaris, FreeBSD, etc.

Note: Developers writing applications for OS X do not need to incorporate this code into their applications, since OS X provides a system

service to handle this for them. If every application developer were to link-in the mDNSResponder code into their application, then we would end up with a situation like the picture below:



This would not be very efficient. Each separate application would be sending their own separate multicast UDP packets and maintaining their own list of answers. Because of this, macOS and POSIX versions of mDNSResponder provide a common system service which client software should access through the "/usr/include/dns\_sd.h" APIs.

The situation on Apple and POSIX platforms looks more like the picture below:



In this configuration, applications make interprocess-communication (IPC) calls to the single mDNSResponder daemon which implements the mDNS and DNS-SD protocols.

Vendors of products such as printers, which are closed environments not expecting to be running third-party application software, can reasonably implement a single monolithic mDNSResponder to advertise all the services of that device. Vendors of open systems which run third-party application software should implement a system service such as the one provided by the OS X mDNSResponder daemon, and application software on that platform should, where possible, make use of that system service instead of embedding their own mDNSResponder.

See ReadMe.txt in the mDNSPosix directory for specific details of building an mDNSResponder on a POSIX Operating System.

Documents/mDNSResponder.md.

## Exemplary Disclosures

### OpenThread Stub Network Border Router

The OpenThread Stub Network Border Router (henceforth "BR") consists of three parts: OpenThread itself, the Service Registration Protocol Advertising Proxy, and the OpenThread Stub Network Border Router management system, which is currently included as part of the Advertising Proxy.

Currently the BR is known to work on Raspbian Buster on the Raspberry Pi 4. It should also be possible to make it work on OpenWRT and other Linux installations. No BSD installations have been attempted yet. If you wish to set up a BR for your own use, your best way forward is to get a Raspberry Pi 4. Instructions for setting up a BR on a Raspberry Pi are included below.

The BR connects to one or more infrastructure networks using either or both of its Ethernet and Wi-Fi network interfaces. Additional infrastructure link connections can be established either using additional USB Ethernet adapters, additional USB Wi-Fi adapters, or VLANs. Most applications will only need a single infrastructure connection.

The BR requires one or more Thread devices to be connected in order to form a Thread mesh. If no Thread devices are present, no Thread mesh will form, and the BR will not advertise routes nor start the SRP Advertising Proxy.

Documents/openthread-border-router.md.

### DNSSD Service Registration Protocol Client

The DNSSD SRP client is a sample implementation implemented using a generic API that should work on a variety of platforms. Two APIs are currently offered, one for [POSIX platforms](#) and another for [Thread](#). The API is documented in [a header file](#).

API implementations provide functions that are used to discover network configuration information, send and receive packets, set timers, and so on. These functions must be provided for a new platform. In addition, the platform is responsible for actually invoking the SRP client, and several entry points are provided to facilitate this.

Documents/srp-client.md.

*See generally*, GitHub mDNS Documentation.

ServiceRegistration/srp-api.h.

ServiceRegistration/srp-thread.c.

mDNSCore/mDNS.c.

mDNSCore/DNSCommon.h.

mDNSCore/mDNSEmbeddedAPI.h.

*See generally*, Apple Source Code.

*See also generally*, Apple Network Configuration API.

“The third zero configuration protocol area is service discovery. Clients should be able to discover services on the network without prior configuration, and without any administered configuration management services (such as directories) on the network. Furthermore, the service discovery protocol must not cause broadcast storms or other unscalable behavior. (Some existing service discovery protocols—most notably the Service Advertising Protocol from the IPX protocol suite—require inordinate network resources.)”

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

“The fourth protocol area the working group identified is multicast address allocation. Some multicast-based applications need to obtain a unique multicast address to prevent other applications (or sessions based on the same application) from conflicting with them. A multicast address conflict can cause applications to fail in an analogous way to two hosts configured with the same IP address: Communication from the two distinct sessions could be delivered to incorrect destinations.

The zeroconf multicast address allocation protocol (ZMAAP)<sup>12</sup> allows applications to

- allocate unique addresses and maintain them over time;
- prevent reallocation of assigned addresses; and
- be notified of multicast allocation collision.”

Guttman at 84-85.

*See also*, IETF Zeroconf.

For another example, the Airport Express blinks solid green light upon successful connection.

When you plug AirPort Express into the wall, the status light flashes green and then glows amber while it starts up. Once it has started up completely, the status light glows solid green.

#### AirPort Express Status Lights

The following table explains AirPort Express light sequences and what they indicate.

Light	Status/description
Off	AirPort Express is unplugged.
Flashing green	AirPort Express is starting up. <i>Note:</i> If you choose Flash On Activity from the Status Light pop-up menu in the Base Station pane of AirPort Admin Utility, the status light may flash green to indicate normal activity.
Solid green	AirPort Express is on and working properly. If you choose Flash On Activity from the Status Light pop-up menu in the Base Station pane of AirPort Admin Utility, the status light may flash green to indicate normal activity.
Flashing amber	AirPort Express cannot establish a connection to the network or the Internet. See “Your AirPort Express Status Light Flashes Amber” on page 38.
Solid amber	AirPort Express is completing its startup sequence.
Flashing amber and green	There may be a problem starting up. AirPort Express will restart and try again.

Airport Express Setup Guide at 10.

*See also*, Cheshire at FIG. 3, 4:66-5:2.

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant's cover pleading.

**5. The playback device of claim 4, wherein providing the indication comprises transmitting, to the computing device via the initial communication path, at least a third message indicating that the playback device has successfully received the network configuration parameters.**

Airport Express discloses this feature. For example, the Airport Express transmits a third message to the computer via the initial communication path indicating the network configuration parameters have been received. *See, e.g.*, the following:

#### 4.1 mDNS Service Discovery

With our current mDNS Service Discovery, the process would be:

##### 4.1.1. Determine the domain to browse.

Since the user does not specify the domain in which to look for the `_hap` service, we first need to determine the appropriate domain, which is called the "browsing domain". mDNSResponder maintains a list of browsing domains, one of which is always `.local`. Other browsing domains can be discovered using the mechanism described in [Section 11 of DNS-Based Service Discovery](#). Since the device is being advertised using multicast DNS on the local network, even if other default browsing domains are configured on that network, the domain in which it can be discovered will be `.local`.

##### 4.1.2. Determine where the query should be sent.

Like the browsing domain, the user does not know (and probably doesn't care) where the query should go. mDNSResponder will attempt to find the service in all of the default browsing domains. Since one of these is `.local`, which is resolved using multicast DNS, we will send a query for the service to the multicast address (`224.0.0.251` or `ff02::fb`).

##### 4.1.3. Find the service instances that are providing the `_hap._udp` service.

To do that, mDNSResponder sends out a query with the domain and destination we get above with mDNS:

```
_hap._udp.local. PTR ?
```

Each device on the local network that is advertising an instance of the service will respond with an answer for its service:

```
_hap._udp.local. PTR my-homekit-device-1._hap._udp.local.  
_hap._udp.local. PTR my-homekit-device-2._hap._udp.local.
```

Now the user knows that there are two service instances in the network: `my-homekit-device-1._hap._udp.local` and `my-homekit-device-2._hap._udp.local`. Suppose the user chooses `my-homekit-device-1._hap._udp.local`.

##### 4.1.4. Resolve the service instance.

mDNSResponder will then send out a query using mDNS, for the service instance name chosen by user:

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

```
my-homekit-device-1._hap._udp.local. SRV ?
```



The response will be the host name of the device, and the port number on which the service is available on that device:

```
my-homekit-device-1._hap._udp.local. SRV my-homekit-device-1.local 12345
```



#### 4.1.5. Resolve the local host name and connect to it.

To find the address of the device, mDNSResponder sends out A and AAAA queries:

```
my-homekit-device-1.local A/AAAA ?
```



The response from the device will include zero or more A and zero or more AAAA records, for example:

```
my-homekit-device-1.local A 192.0.2.17
my-homekit-device-1.local A 169.254.123.234
my-homekit-device-1.local AAAA fe80::fedc:1234:6cd1:0c2a
```



With these IP addresses and the port number, the client now knows how to connect to the desired device and use the service. Service discovery is now complete.

## Documents/Automatic Discovery of DNS Push Zones.md.

### DNSSD Advertising Proxy

The DNSSD Advertising proxy advertises services registered using SRP on one or more links using mDNS. The primary purpose of this proxy is to enable discovery of devices on [stub networks](#).

The advertising proxy works by providing [DNSSD Service Registration Protocol](#) service on some link, typically a stub network link. Hosts on the stub network can offer services that should be discoverable both on the stub network and on the adjacent infrastructure link. To do this, they register their service using the DNSSD Service Registration Protocol.

Once a service has been registered with the advertising proxy, the advertising proxy stores that information in its internal database and then advertises it on the adjacent infrastructure link (typically a home Wi-Fi network) using multicast DNS. Registrations must be periodically renewed; if they are not, then the registration is eventually removed from the database and is no longer advertised using mDNS.

## Documents/advertising-proxy.md.

# Exhibit 833-09: Airport Express

## Exemplary Disclosures

### About the mDNSResponder Code

Because Apple benefits more from widespread adoption of Bonjour than it would benefit from keeping Bonjour proprietary, Apple is making this code open so that other developers can use it too.

Because Apple recognises that networks are heterogeneous environments where devices run many different kinds of OS, this code has been made as portable as possible.

A typical mDNS program contains three components:



The "mDNS Core" layer is absolutely identical for all applications and all Operating Systems.

The "Platform Support" layer provides the necessary supporting routines that are specific to each platform -- what routine do you call to send a UDP packet, what routine do you call to join multicast group, etc.

The "Application" layer does whatever that particular application wants to do. It calls routines provided by the "mDNS Core" layer to perform the functions it needs:

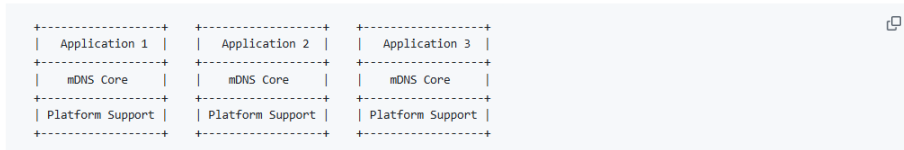
- advertise services,
- browse for named instances of a particular type of service
- resolve a named instance to a specific IP address and port number
- etc.

The "mDNS Core" layer in turn calls through to the "Platform Support" layer to send and receive the multicast UDP packets to do the actual work.

Apple currently provides "Platform Support" layers for macOS, Microsoft Windows, and for POSIX platforms like Linux, Solaris, FreeBSD, etc.

Note: Developers writing applications for OS X do not need to incorporate this code into their applications, since OS X provides a system

service to handle this for them. If every application developer were to link-in the mDNSResponder code into their application, then we would end up with a situation like the picture below:



This would not be very efficient. Each separate application would be sending their own separate multicast UDP packets and maintaining their own list of answers. Because of this, macOS and POSIX versions of mDNSResponder provide a common system service which client software should access through the "/usr/include/dns\_sd.h" APIs.

The situation on Apple and POSIX platforms looks more like the picture below:



In this configuration, applications make interprocess-communication (IPC) calls to the single mDNSResponder daemon which implements the mDNS and DNS-SD protocols.

Vendors of products such as printers, which are closed environments not expecting to be running third-party application software, can reasonably implement a single monolithic mDNSResponder to advertise all the services of that device. Vendors of open systems which run third-party application software should implement a system service such as the one provided by the OS X mDNSResponder daemon, and application software on that platform should, where possible, make use of that system service instead of embedding their own mDNSResponder.

See ReadMe.txt in the mDNSPosix directory for specific details of building an mDNSResponder on a POSIX Operating System.

Documents/mDNSResponder.md.

## Exemplary Disclosures

### OpenThread Stub Network Border Router

The OpenThread Stub Network Border Router (henceforth "BR") consists of three parts: OpenThread itself, the Service Registration Protocol Advertising Proxy, and the OpenThread Stub Network Border Router management system, which is currently included as part of the Advertising Proxy.

Currently the BR is known to work on Raspbian Buster on the Raspberry Pi 4. It should also be possible to make it work on OpenWRT and other Linux installations. No BSD installations have been attempted yet. If you wish to set up a BR for your own use, your best way forward is to get a Raspberry Pi 4. Instructions for setting up a BR on a Raspberry Pi are included below.

The BR connects to one or more infrastructure networks using either or both of its Ethernet and Wi-Fi network interfaces. Additional infrastructure link connections can be established either using additional USB Ethernet adapters, additional USB Wi-Fi adapters, or VLANs. Most applications will only need a single infrastructure connection.

The BR requires one or more Thread devices to be connected in order to form a Thread mesh. If no Thread devices are present, no Thread mesh will form, and the BR will not advertise routes nor start the SRP Advertising Proxy.

Documents/openthread-border-router.md.

### DNSSD Service Registration Protocol Client

The DNSSD SRP client is a sample implementation implemented using a generic API that should work on a variety of platforms. Two APIs are currently offered, one for [POSIX platforms](#) and another for [Thread](#). The API is documented in [a header file](#).

API implementations provide functions that are used to discover network configuration information, send and receive packets, set timers, and so on. These functions must be provided for a new platform. In addition, the platform is responsible for actually invoking the SRP client, and several entry points are provided to facilitate this.

Documents/srp-client.md.

*See generally, GitHub mDNS Documentation.*

ServiceRegistration/srp-api.h.

ServiceRegistration/srp-thread.c.

mDNSCore/mDNS.c.

mDNSCore/DNSCommon.h.

mDNSCore/mDNSEmbeddedAPI.h.

*See generally, Apple Source Code.*

## Exemplary Disclosures

[System Configuration](#) / [SCNetworkConfiguration](#)

API Collection

### SCNetworkConfiguration

#### Overview

The `SCNetworkConfiguration` programming interface provides access to the stored network configuration. The functions include providing access to the network-capable devices on the system, the network sets, network services, and network protocols. Note that these functions follow Core Foundation function-name conventions. A function that has "Create" or "Copy" in its name returns a reference you must release with the [CFRelease](#) function.

Note that when using the functions in this programming interface, you must call the [SCPreferencesCommitChanges](#) function to ensure that your changes are committed to permanent storage.

[System Configuration](#) / [SCNetworkServiceCreate](#)

Function

### SCNetworkServiceCreate

Creates a new network service for the specified interface in the configuration.

macOS 10.4+

```
SCNetworkServiceRef SCNetworkServiceCreate(SCPreferencesRef prefs, SCNetworkInterfaceRef interface);
```

#### Parameters

`prefs`

The preferences session.

`interface`

The network interface for which to create the new service.

#### Return Value

The new network service. You must release the returned value.

#### See Also

##### Configuring Network Services

[SCNetworkServiceAddProtocolType](#)

Adds the network protocol of the specified type to the specified service.

# Exhibit 833-09: Airport Express

## Exemplary Disclosures

[System Configuration](#) / `SCPreferencesCreate`

Function

### SCPreferencesCreate

Initiates access to the per-system set of configuration preferences.

macOS 10.1+

```
SCPreferencesRef SCPreferencesCreate(CFAllocatorRef allocator, CFStringRef name, CFStringRef prefsID);
```

### Parameters

**allocator**

The allocator to use to allocate memory for this preferences session. If the value is not a valid `CFAllocator`, the behavior is undefined. Pass `NULL` or `kCFAllocatorDefault` to use the current default `CFAllocator`.

**name**

The name of the calling process.

**prefsID**

The name of the group of preferences to be accessed or updated. A name that starts with a leading `/` character specifies the absolute path to the file containing the preferences to be accessed. A name that does not start with a leading `/` character specifies a file relative to the default system preferences directory.

To access the default system preferences, pass in `NULL`.

### Return Value

A reference to the new preferences session. You must release the returned value.

## Exemplary Disclosures

[System Configuration](#) / `SCNetworkServiceGetName`

Function

### SCNetworkServiceGetName

Returns the user-specified name associated with the specified service.

macOS 10.4+

```
NSStringRef SCNetworkServiceGetName(SCNetworkServiceRef service);
```

### Parameters

`service`  
The network service.

### Return Value

The user-specified name associated with the service.

### See Also

#### Configuring Network Services

[SCNetworkServiceAddProtocolType](#)  
Adds the network protocol of the specified type to the specified service.

[SCNetworkServiceCopy](#)  
Returns the network service with the specified identifier.

[SCNetworkServiceCopyAll](#)

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

[System Configuration](#) / SCNetworkServiceSetName

Function

## SCNetworkServiceSetName

Stores the user-specified name for the specified service.

macOS 10.4+

```
Boolean SCNetworkServiceSetName(SCNetworkServiceRef service, CFStringRef name);
```

### Parameters

`service`

The network service.

`name`

The user-defined name to associate with the service.

### Return Value

TRUE if the name was saved; FALSE if an error occurred.

### Discussion

Although it is not technically required, the user-specified names for all services within any given set should be unique. For this reason, an error will be returned if you attempt to name two services with the same string.

## Exemplary Disclosures

[System Configuration](#) / `SCNetworkSetCopyCurrent`

Function

### SCNetworkSetCopyCurrent

Returns the current set.

macOS 10.4+

```
SCNetworkSetRef SCNetworkSetCopyCurrent(SCPreferencesRef prefs);
```

### Parameters

`prefs`

The preferences session.

### Return Value

The current set, or NULL if no current set has been defined.

### See Also

#### Configuring Network Sets

[SCNetworkSetAddService](#)

Adds the specified network service to the specified set.

[SCNetworkSetContainsInterface](#)

Apple Network Configuration API.

*See generally*, Apple Network Configuration API.

“The third zero configuration protocol area is service discovery. Clients should be able to discover services on the network without prior configuration, and without any administered configuration management services (such as directories) on the network. Furthermore, the service discovery protocol must not cause broadcast storms or other unscalable behavior. (Some existing service discovery protocols—most notably the Service Advertising Protocol from the IPX protocol suite—require inordinate network resources.)”

“The fourth protocol area the working group identified is multicast address allocation. Some multicast-based applications need to obtain a unique multicast address to prevent other applications (or sessions based on the same application) from conflicting with them. A multicast address conflict can cause applications to fail in an analogous way to two hosts configured with the same IP address: Communication from the two distinct sessions could be delivered to incorrect destinations.

The zeroconf multicast address allocation protocol (ZMAAP)<sup>12</sup> allows applications to

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

- allocate unique addresses and maintain them over time;
- prevent reallocation of assigned addresses; and
- be notified of multicast allocation collision.”

Guttman at 84-85.

*See also*, IETF Zeroconf.

*See also*, Cheshire at FIG. 3, 4:66-5:2.

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant’s cover pleading.

**9. The playback device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising: receiving, from the computing device, a command to assign a name to the playback device.**

Airport Express discloses this feature. For example, the Airport Express comprises program instructions stored on the non-transitory computer-readable medium that, when executed by the processor, cause the media adapter to perform functions comprising: receiving, from the computing device, a command to assign a name to the Airport Express. *See, e.g.*, the following:

#### AirPort Express can store settings for different locations so you can easily move it from place to place.

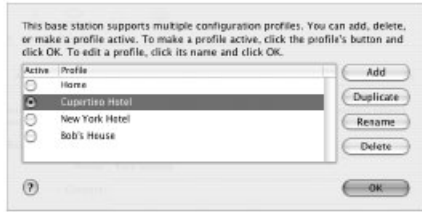
AirPort Express can store up to 5 different configurations, known as *profiles*. A profile contains settings for your AirPort Express, such as the iTunes speaker name and password, and network information, such as network name and password.

Profiles may be useful if you move your AirPort Express from one location to another. For example, you might have one profile for your AirPort Express at home, where you use iTunes to play music on your home stereo from iTunes and connect to the Internet using PPPoE. You might have another profile for using AirPort Express in a hotel, where you connect to the Internet using DHCP.

Use AirPort Admin Utility, located in Applications/Utilities on a Macintosh, and in Start > All Programs > AirPort on a computer using Windows XP or Windows 2000, to create, edit, rename, and delete profiles.

## Exhibit 833-09: Airport Express

### Exemplary Disclosures



#### To create a new profile:

- 1 Open AirPort Admin Utility, select your AirPort Express in the list, and click Configure.
- 2 Click the Profiles icon in the toolbar.
- 3 Click Add to create a new profile, give the profile a name, then click OK.
- 4 Set options, such as network name, remote speaker name, passwords, and the Internet connection method.
- 5 When you are finished setting the options, click Update.

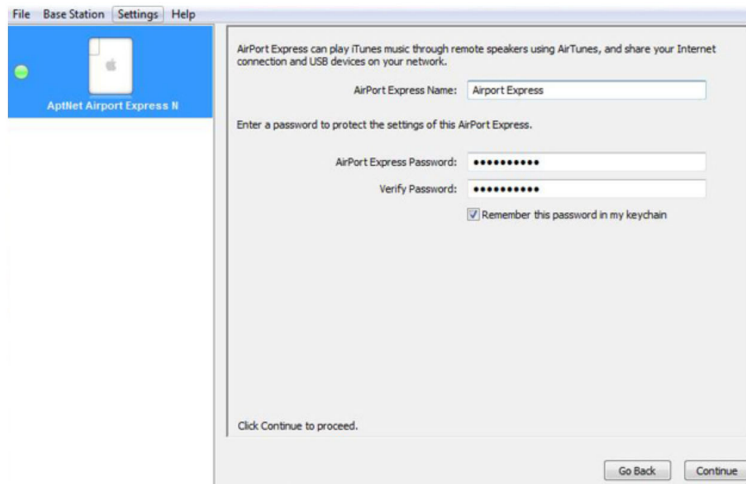
#### To edit an existing profile:

- 1 Open AirPort Admin Utility, select your AirPort Express in the list, and click Configure.
- 2 Click the Profiles icon in the toolbar.
- 3 Select a profile in the list and click OK.
- 4 Edit options for the profile. When you are finished editing the options, click Update to save the profile and make it active on your AirPort Express.

### Airport Express Setup Guide at 33-34.

#### Apple Airport Express

1. To set up and configure your AirPort Express to use AirPort for wireless networking and Internet access, use the AirPort Setup Assistant for Mac OS X, or the AirPort Express Assistant for Windows XP. (The assistant is installed on your computer when you install the software on the AirPort Express CD or you can also download it from [Apple](#).)
2. After unpacking your Airport Express, connect the ethernet cable from your jack to the ethernet port on the Airport Express. Plug the AC adapter into an electrical outlet.
3. Open the AirPort Setup Assistant, located in Applications/Utilities on a Macintosh, or the AirPort Express Assistant, located in Start > All Programs > AirPort on a computer using Windows XP. Follow the onscreen instructions to configure and share Internet access on your AirPort Express.
4. Enter a Base Station Name and Password click Continue. Write these names down for future reference.



### Airport Express Setup Example at 1.

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant's cover pleading.

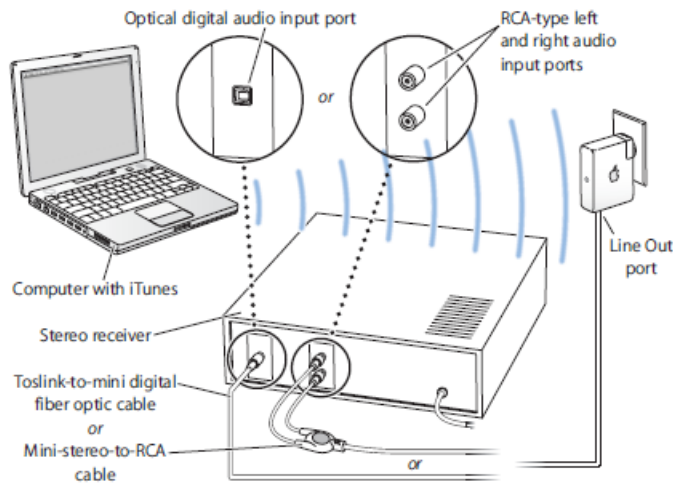
#### 10. The playback device of claim 1, wherein communicating with the computing device via the secure WLAN comprises receiving a command related to playback of audio content.

Airport Express discloses this feature. For example, the Airport Express communicates with the computer via the secure WLAN and receives a command related to playback of audio content. *See, e.g.*, the following:

#### Using AirPort Express With AirTunes to Play iTunes Music on Your Stereo

You can connect your AirPort Express to your stereo with a Toslink-to-mini digital fiber optic cable or a mini-stereo-to-dual-RCA cable, and use AirTunes to wirelessly play music from iTunes.

##### What It Looks Like



##### How to Set It Up

- 1 Connect your AirPort Express to your home stereo or powered speakers using a digital fiber optic cable or analog mini-stereo-to-dual-RCA connected to the stereo mini-jack (40).
- 2 Use the AirPort Setup Assistant for Mac OS X or the AirPort Express Assistant for Windows XP to create a new network. (See page 26 for more information.)
- 3 Open iTunes on your computer and choose your stereo or speakers from the speakers pop-up menu in the lower right of the iTunes window.

Wireless computers within range of AirPort Express can wirelessly stream music to it using iTunes 4.6 or later. Only one computer at a time can stream music to AirPort Express. You cannot stream music to more than one AirPort Express at a time.

**Note:** Do not connect AirPort Express to the phono jack on your stereo.

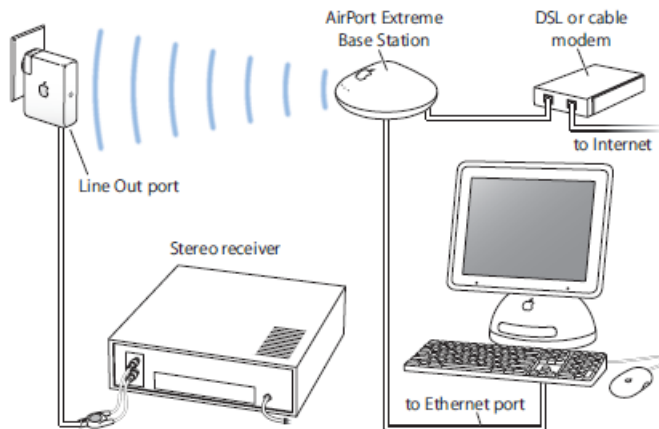
## Exhibit 833-09: Airport Express

### Exemplary Disclosures

#### Using AirPort Express on an Existing Wireless Network to Stream Music to Your Home Stereo

You can also connect AirPort Express to a wireless network and use iTunes to play music on your stereo from iTunes. Connecting AirPort Express to your existing network allows you to place AirPort Express in another room, within range of your network.

#### What It Looks Like



Airport Express Setup Guide at 15-17.

#### This chapter provides information and instructions for using the AirPort Express software to set up your AirPort Express.

Use the diagrams in the previous chapter to help you decide where you want to use your AirPort Express, and what features you want to set up on your AirPort network. Then use the instructions in this chapter to easily configure AirPort Express and set up your AirPort network.

AirPort Express software lets you:

- Set up a new network that wireless computers can use to communicate with each other. If you set up your AirPort Express as a base station and connect it to the Internet, wireless computers can also share the Internet connection.
- Connect your AirPort Express to your existing wireless network and use iTunes to play iTunes music on your home stereo or powered speakers, and connect a USB printer to share.
- Connect your AirPort Express to your existing AirPort Extreme or AirPort Express network and extend the range of your wireless network using the AirPort Express as a wireless bridge. This is known as a WDS (Wireless Distribution System).

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

You can use iTunes to play music from iTunes and share a USB printer in any type of network you set up, whether it is a new network or you are joining an existing network.

If you have more than one AirPort Express, you can connect one to the stereo in your living room and connect another to the powered speakers in your den. Using iTunes, you can stream your iTunes music to either AirPort Express, depending on where you are in your house. Choose the name of the AirPort Express you want to use from the speakers pop-up menu in iTunes.

This chapter provides an overview for using the AirPort Express Assistant to set up your network and other features of your AirPort Express. For more detailed wireless networking information, and for information about the advanced features of AirPort, refer to the document "Designing AirPort Networks," or "AirPort Networks for Windows," located on the AirPort Express CD, and at [www.apple.com/airportextreme](http://www.apple.com/airportextreme).

You can do most of your network setup and configuration tasks with the AirPort Setup Assistant for Mac OS X and the AirPort Express Assistant for Windows XP. To set advanced options, you need to use AirPort Admin Utility. See "Setting Advanced Options" on page 32.

**Note:** If you are using Windows 2000, use AirPort Admin Utility for Windows to set up your AirPort Express. The AirPort Express Assistant is not compatible with Windows 2000.

#### Using the AirPort Setup Assistant or the AirPort Express Assistant

To set up and configure your AirPort Express to use AirPort for wireless networking and Internet access, use the AirPort Setup Assistant for Mac OS X, or the AirPort Express Assistant for Windows XP. (The assistant is installed on your computer when you install the software on the AirPort Express CD.)

Airport Express Setup Guide at 26-27.

*See also*, Cheshire at 3:3-14.

*See also*, Kearney at FIG. 11, 2:18-28, 8:11-29, 9:24-33, 9:45-55, 10:24-33, 10:38-44, 11:8-12.

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant's cover pleading.

**11. The playback device of claim 10, wherein the command comprises a command to retrieve audio content for playback from an audio source that is accessible via a communication path that includes the secure WLAN, and wherein the playback device further comprises program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:**

**in response to receiving the command, retrieving the audio content from the audio source via the communication path that includes the secure WLAN.**

Airport Express discloses this feature. For example, the command comprises a command to retrieve audio content for playback from an audio source that is accessible via a communication path that includes the secure WLAN and the Airport Express further comprises program instructions stored on the non-transitory computer-readable medium that, when executed by the

## Exhibit 833-09: Airport Express

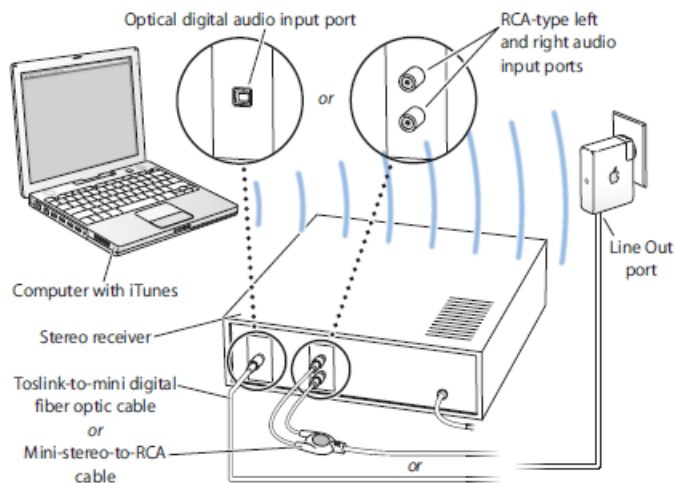
### Exemplary Disclosures

processor, cause the media adapter to perform functions comprising: in response to receiving the command, retrieving the audio content from the audio source via the communication path that includes the secure WLAN. *See, e.g.,* the following:

#### Using AirPort Express With AirTunes to Play iTunes Music on Your Stereo

You can connect your AirPort Express to your stereo with a Toslink-to-mini digital fiber optic cable or a mini-stereo-to-dual-RCA cable, and use AirTunes to wirelessly play music from iTunes.

##### What It Looks Like



##### How to Set It Up

- 1 Connect your AirPort Express to your home stereo or powered speakers using a digital fiber optic cable or analog mini-stereo-to-dual-RCA connected to the stereo mini-jack (40).
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**Note:** Do not connect AirPort Express to the phono jack on your stereo.

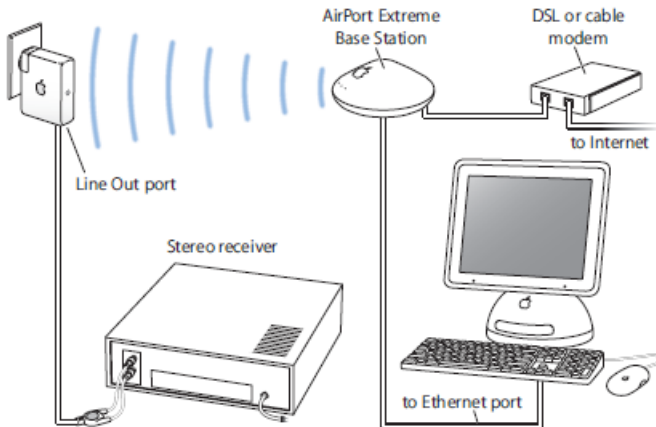
## Exhibit 833-09: Airport Express

### Exemplary Disclosures

#### Using AirPort Express on an Existing Wireless Network to Stream Music to Your Home Stereo

You can also connect AirPort Express to a wireless network and use iTunes to play music on your stereo from iTunes. Connecting AirPort Express to your existing network allows you to place AirPort Express in another room, within range of your network.

#### What It Looks Like



Airport Express Setup Guide at 15-17.

#### This chapter provides information and instructions for using the AirPort Express software to set up your AirPort Express.

Use the diagrams in the previous chapter to help you decide where you want to use your AirPort Express, and what features you want to set up on your AirPort network. Then use the instructions in this chapter to easily configure AirPort Express and set up your AirPort network.

AirPort Express software lets you:

- Set up a new network that wireless computers can use to communicate with each other. If you set up your AirPort Express as a base station and connect it to the Internet, wireless computers can also share the Internet connection.
- Connect your AirPort Express to your existing wireless network and use iTunes to play iTunes music on your home stereo or powered speakers, and connect a USB printer to share.
- Connect your AirPort Express to your existing AirPort Extreme or AirPort Express network and extend the range of your wireless network using the AirPort Express as a wireless bridge. This is known as a WDS (Wireless Distribution System).

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

You can use iTunes to play music from iTunes and share a USB printer in any type of network you set up, whether it is a new network or you are joining an existing network.

If you have more than one AirPort Express, you can connect one to the stereo in your living room and connect another to the powered speakers in your den. Using iTunes, you can stream your iTunes music to either AirPort Express, depending on where you are in your house. Choose the name of the AirPort Express you want to use from the speakers pop-up menu in iTunes.

This chapter provides an overview for using the AirPort Express Assistant to set up your network and other features of your AirPort Express. For more detailed wireless networking information, and for information about the advanced features of AirPort, refer to the document "Designing AirPort Networks," or "AirPort Networks for Windows," located on the AirPort Express CD, and at [www.apple.com/airportextreme](http://www.apple.com/airportextreme).

You can do most of your network setup and configuration tasks with the AirPort Setup Assistant for Mac OS X and the AirPort Express Assistant for Windows XP. To set advanced options, you need to use AirPort Admin Utility. See "Setting Advanced Options" on page 32.

**Note:** If you are using Windows 2000, use AirPort Admin Utility for Windows to set up your AirPort Express. The AirPort Express Assistant is not compatible with Windows 2000.

#### Using the AirPort Setup Assistant or the AirPort Express Assistant

To set up and configure your AirPort Express to use AirPort for wireless networking and Internet access, use the AirPort Setup Assistant for Mac OS X, or the AirPort Express Assistant for Windows XP. (The assistant is installed on your computer when you install the software on the AirPort Express CD.)

Airport Express Setup Guide at 26-27.

*See also*, Cheshire at 3:3-14.

*See also*, Kearney at FIG. 11, 2:18-28, 8:11-29, 9:24-33, 9:45-55, 10:24-33, 10:38-44, 11:8-12.

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant's cover pleading.

**13. The computing device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising:**  
**after transitioning to communicating with computing device via the secure WLAN, receiving, from the computing device, a command to form a group with at least a first playback device of a networked audio system such that the playback device is configured to play back audio content in synchrony with at least the first playback device.**

Claim 13 recites "The computing device of claim 1, further comprising ..." and "cause the computing device to perform functions comprising." The term "the computing device" lacks antecedent basis. As such, claim 13 is indefinite.

To the extent the court finds claim 13 not indefinite, Airport Express discloses this feature. For example, the Airport Express comprises program instructions stored on the non-transitory

## Exhibit 833-09: Airport Express

### Exemplary Disclosures

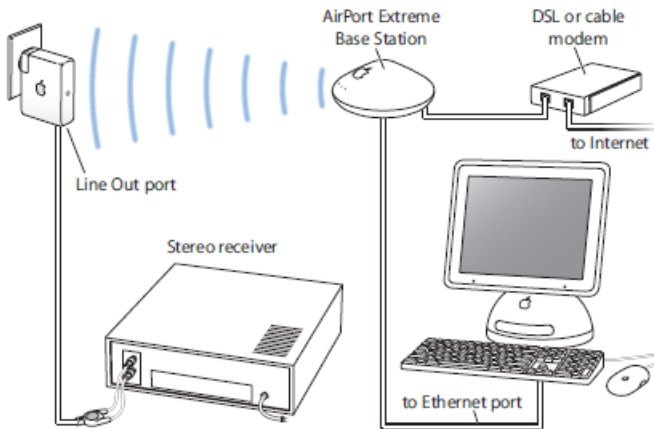
computer-readable medium that, when executed by the processor, cause the computer to perform functions comprising: after transitioning to communicating with computer via the secure WLAN, receiving, from the computer, a command to form a group with at least a first playback device of a networked audio system such that the playback device is configured to play back audio content in synchrony with at least the first playback device. *See, e.g.*, the following:

For example, more than one Airport Express devices can be commanded from the computer to play the same audio content in synchrony. *See, e.g.*, the following:

#### Using AirPort Express on an Existing Wireless Network to Stream Music to Your Home Stereo

You can also connect AirPort Express to a wireless network and use iTunes to play music on your stereo from iTunes. Connecting AirPort Express to your existing network allows you to place AirPort Express in another room, within range of your network.

#### What It Looks Like



Airport Express Setup Guide at 17.

## Exhibit 833-09: Airport Express

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Airport Express Setup Guide at 27.

See also, Cheshire at 3:3-14.

See also, Kearney at FIG. 11, 2:18-28, 8:11-29, 9:24-33, 9:45-55, 10:24-33, 10:38-44, 11:8-12.

To the extent that Airport Express is found not to disclose this feature, it would have been obvious based on the disclosures of Airport Express alone or in combination with the disclosures of one or more of the references cited for this limitation in Exhibits 883-01 through 883-11 or Exhibit 883-B for the reasons discussed herein and in Defendant's cover pleading.

**14[pre]. A non-transitory, computer-readable storage medium, wherein the non-transitory computer-readable storage medium is provisioned with program instructions that are executable to cause a playback device to perform functions comprising:**

Defendant does not concede that the preamble is limiting. To the extent it is limiting, Airport Express discloses the preamble. For example, *see supra* Claim 1[pre], 1[c], 1[d].

**14[a] detecting a triggering event that causes the playback device to enter a setup mode in which the playback device transmits at least a first message indicating that the playback device is available for setup;**

Airport Express discloses this feature. For example, *see supra* Claim 1[e].

**14[b] while in the setup mode, receiving a response to the first message that facilitates establishing an initial communication path with a computing device that is installed with**

Exhibit 833-09: Airport Express

Exemplary Disclosures
<b>an application for controlling the playback device, wherein the computing device is operating on a secure wireless local area network (WLAN) that is defined by an access point, wherein the initial communication path with the computing device does not traverse the access point;</b>
Airport Express discloses this feature. For example, <i>see supra</i> Claim 1[f].
<b>14[c] receiving, from the computing device via the initial communication path, at least a second message containing network configuration parameters for the secure WLAN, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN;</b>
Airport Express discloses this feature. For example, <i>see supra</i> Claim 1[g].
<b>14[d] using the network configuration parameters to connect to the secure WLAN that is defined by the access point; and</b>
Airport Express discloses this feature. For example, <i>see supra</i> Claim 1[h].
<b>14[e] transitioning from communicating with the computing device via the initial communication path to communicating with the computing device via the secure WLAN that is defined by the access point.</b>
Airport Express discloses this feature. For example, <i>see supra</i> Claim 1[i].
<b>15. The non-transitory, computer-readable storage medium of claim 14, wherein the triggering event comprises one of (a) powering on the playback device or (b) receiving user input via a physical interface of the playback device.</b>
Airport Express discloses this feature. For example, <i>see supra</i> Claim 2.
<b>16. The non-transitory, computer-readable storage medium of claim 14, wherein the non-transitory computer-readable medium is also provisioned with program instructions that are executable to cause the playback device to perform functions comprising:  after receiving the second message, providing an indication that the playback device has successfully received the network configuration parameters for the secure WLAN.</b>
Airport Express discloses this feature. For example, <i>see supra</i> Claim 4.
<b>17. The non-transitory, computer-readable storage medium of claim 16, wherein providing the indication comprises transmitting, to the computing device via the initial</b>

Exhibit 833-09: Airport Express

Exemplary Disclosures
<b>communication path, at least a third message indicating that the playback device has successfully received the network configuration parameters.</b>
Airport Express discloses this feature. For example, <i>see supra</i> Claim 5.
<b>19. The non-transitory, computer-readable storage medium of claim 14, wherein communicating with the computing device via the secure WLAN comprises receiving a command to retrieve audio content for playback from an audio source that is accessible via a communication path that includes the secure WLAN, and wherein the non-transitory computer-readable medium is also provisioned with program instructions that are executable to cause the playback device to perform functions comprising:  in response to receiving the command, retrieving the audio content from the audio source via the communication path that includes the secure WLAN.</b>
Airport Express discloses this feature. For example, <i>see supra</i> Claim 10.