

**Application of U.S. Patent No. 9,107,000 (“’000”)  
to the Accused Transmitter Products**

Plaintiff accuses Defendants Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, “Samsung” or “Defendants”) of infringement through making, using, selling, offering for sale and importation of the Accused Transmitter Products. The term “Accused Transmitter Products” herein is defined as it is in Plaintiff’s Preliminary Infringement Contentions.

The Accused Transmitter Products are accused of directly infringing U.S. Patent No. 9,107,000 (“’000”) during the relevant damages period. Plaintiff further accuses Defendants of indirectly infringing the ’000 Patent through providing, authorizing, and instructing regarding the Accused Transmitter Products to others, including its customers. Installing or activating the Accused Transmitter Products and the operation thereof alone and/or with other products directly infringed the asserted claims. Wireless audio products are intended to interoperate with complementary devices also compliant with the same specification or standard. Defendants intended to cause infringement by its customers and users. Defendants instructed users to use the Accused Transmitter Products in an infringing manner. Defendants enacted contractual protections requiring that the Accused Transmitter Products be used in a manner intended by Defendants. Defendants further instructed users to configure and operate the Accused Transmitter Products in an infringing manner. Defendants also provided support services for the Accused Transmitter Products, including providing instructions, guides, online materials, and technical support. The hardware and/or software components of the Accused Transmitter Products were not staple articles or commodities of commerce because they were specifically designed to operated as part of a wireless digital audio system to wirelessly transmit and/or receive representations of an audio signal between corresponding transmitters and receivers, in part, via the use of a unique user code in accordance with the claims of the ’000 Patent.

The asserted claims include elements that were implemented, at least in part, by proprietary electronics and software in the Accused Transmitter Products. The precise source code, designs, data structures, processes, and algorithms used in them are held secret, at least in part, and are not publicly available in their entirety. An analysis of Defendants’ and/or third party documentation and/or source code may be necessary to fully and accurately describe all infringing features and functionality of the Accused Transmitter Products and, accordingly, Plaintiff reserves the right to supplement these charts once such information is made available to Plaintiff. Furthermore, Plaintiff reserves the right to revise these contentions, including as discovery in the case progresses, in view of the Court’s final claim construction in this action and in connection with the provision of Plaintiff’s expert reports.

**Application of U.S. Patent No. 9,107,000 to the Accused Transmitter Products**

Claim 8	Evidence												
<p><b>8. [Pre]</b> A wireless digital coded music audio spread spectrum transmitter operatively coupled to a music audio source and configured to transmit a unique user code and an original audio signal representation in the form of packets, wherein said digital coded music audio transmitter coupled to said music audio source, and configured to be directly communicable with a mobile digital audio spread spectrum receiver, is capable of being moved in any direction during operation, said wireless digital coded audio transmitter comprising:</p>	<p>The Accused Transmitter Products comprises of a wireless digital coded music audio spread spectrum transmitter operatively coupled to a music audio source and configured to transmit a unique user code and an original audio signal representation in the form of packets, wherein said digital coded music audio transmitter coupled to the music audio source, and configured to be directly communicable with a mobile digital audio spread spectrum receiver, is capable of being moved in any direction during operation being a wireless digital coded audio transmitter.</p> <p>The digital audio spread spectrum transmitter of the Accused Transmitter Products (Samsung Galaxy S10) which is compatible with, among others, versions of the 802.11 standard from the Wi-Fi Alliance, also operatively coupled to a music audio source (music application on the device streaming the music). It is and configured to be directly communicable with a mobile digital audio spread spectrum receiver (Galaxy Tab Active3).</p> <div data-bbox="709 768 802 1252" data-label="Image"> </div> <div data-bbox="936 833 1289 1243" data-label="Image"> </div> <div data-bbox="1444 789 1892 1260" data-label="Complex-Block"> <p>NEWLY REDUCED PRICE <span style="float: right;">♥ Wishlist</span></p> <p><b>Galaxy S10 512GB (Unlocked)</b> SM-G973UZKEXAA</p> <p>DEVICE</p> <p>GALAXY S10E    GALAXY S10</p> <p>CARRIER</p> <table border="1"> <tr> <td>Unlocked</td> <td>\$849.99</td> </tr> <tr> <td>verizon</td> <td>\$1149.99</td> </tr> <tr> <td>AT&amp;T</td> <td>\$1149.99</td> </tr> <tr> <td>T-Mobile</td> <td>\$1149.99</td> </tr> <tr> <td>Sprint</td> <td></td> </tr> <tr> <td>US Cellular</td> <td>\$999.99</td> </tr> </table> </div> <p align="center">Samsung Galaxy S10</p> <p align="center"><a href="https://web.archive.org/web/20200406015838/https://www.samsung.com/us/mobile/phones/galaxy-s/galaxy-s10-512gb-unlocked-sm-g973uzkexaa/">https://web.archive.org/web/20200406015838/https://www.samsung.com/us/mobile/phones/galaxy-s/galaxy-s10-512gb-unlocked-sm-g973uzkexaa/</a></p>	Unlocked	\$849.99	verizon	\$1149.99	AT&T	\$1149.99	T-Mobile	\$1149.99	Sprint		US Cellular	\$999.99
Unlocked	\$849.99												
verizon	\$1149.99												
AT&T	\$1149.99												
T-Mobile	\$1149.99												
Sprint													
US Cellular	\$999.99												

	<p>Connectivity</p> <p><b>Wi-Fi Connectivity</b> 802.11 a/b/g/n/ac/ax 2.4G+5GHz, HE80, MIMO, 1024-QAM</p> <p><b>ANT+</b> Yes</p> <p><b>Wi-Fi Direct</b> Yes</p> <p>OS <b>OS</b> Android</p> <p>Sensor Type <sup>?</sup> <b>Type</b> Accelerometer,Barometer,Fingerprint Sensor,Gyro Sensor,Geomagnetic Sensor,Hall Sensor,HR Sensor,RGB Light Sensor,Proximity Sensor</p> <p>Battery <b>Battery, Talk Time</b> <sup>?</sup> Up to 34</p> <p>Audio <b>Audio Playing Format</b> MP3,M4A,3GA,AAC,OGG,OGA,WAV,WMA,AMR,AWB,FLAC,MID,MIDI,XMF,MXMF,IMY,RTTTL,RTX,OTA,DFF,DSF,APE</p> <p><b>USB</b> <sup>?</sup> USB 3.1 Gen 1</p> <p><b>Location Technology</b> GPS,Glionass,Galileo</p> <p><b>NFC</b> Yes</p> <p><b>Bluetooth</b> Bluetooth v5.0</p> <p><b>Earjack</b> 3.5mm Stereo</p> <p><b>PC Sync.</b> Smart Switch (PC version)</p> <p><b>Audio Playback Time (Hours ,Wireless)</b> Up to 103</p> <p><b>Video Playback Time (Hours ,Wireless)</b> Up to 20</p> <p><b>Samsung Galaxy S10</b> <a href="https://web.archive.org/web/20200406015838/https://www.samsung.com/us/mobile/phones/galaxy-s/galaxy-s10-512gb-unlocked-sm-g973uzkexaa/#specs">https://web.archive.org/web/20200406015838/https://www.samsung.com/us/mobile/phones/galaxy-s/galaxy-s10-512gb-unlocked-sm-g973uzkexaa/#specs</a></p>
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<https://www.samsung.com/levant/tablets/galaxy-tab-a/galaxy-tab-active3-8-inch-black-64gb-lte-sm-t575nzkamid/>

<https://web.archive.org/web/20210731123746/https://www.samsung.com/us/business/mobile/tablets/galaxy-tab-active/explore/>

**Connectivity**

<b>ANT+</b> No	<b>USB Version</b> USB 3.1 Gen 1	<b>Location Technology</b> GPS, Glonass, Beidou, Galileo	<b>Earjack</b> 3.5mm Stereo
<b>MHL</b> No	<b>Wi-Fi</b> 802.11 a/b/g/n/ac/ax 2.4G+5GHz, HE80, MIMO, 1024-QAM	<b>Wi-Fi Direct</b> Yes	<b>Bluetooth Version</b> Bluetooth v5.0
<b>NFC</b> Yes	<b>Bluetooth Profiles</b> A2DP, AVRCP, HFP, HID, HOGP, HSP, MAP, OPP, PAN, PBAP	<b>PC Sync.</b> Smart Switch (PC version)	

<https://www.samsung.com/levant/tablets/galaxy-tab-a/galaxy-tab-active3-8-inch-black-64gb-lte-sm-t575nzkamid/>

<https://web.archive.org/web/20210731123746/https://www.samsung.com/us/business/mobile/tablets/galaxy-tab-active/explore/>

### **18.1 Overview**

This clause specifies the High Rate extension of the PHY for the Direct Sequence Spread Spectrum (DSSS) system (Clause 15 of IEEE Std 802.11, 1999 Edition), hereinafter known as the High Rate PHY for the 2.4 GHz band designated for ISM applications.

IEEE Std 802.11b-1999 SUPPLEMENT TO IEEE STANDARD FOR INFORMATION TECHNOLOGY, p. 11  
<https://standards.ieee.org/ieee/802.11b/1166/>

The transmitter of the Accused Transmitter Products uses a unique user code, e.g. friendly name (“device name”), while pairing with a digital audio spread spectrum receiver during, e.g., device discovery, pairing, and/or audio streaming.

Device Discovery (and optional Service Discovery) is intended to determine which P2P Devices may attempt to connect. Device selection may be based on non-unique information, e.g. Device Name, which potentially introduces ambiguity in this process. P2P Device manufacturers should attempt to create unique Device Names and user interfaces that maximize the probability of selecting the correct device, but there will be cases where device selection is non-deterministic. Group Formation uses the authentication provided by Wi-Fi Simple Configuration [2] to determine that the correct devices are connected. Group Formation may need to be executed more than once with different P2P devices to resolve the case of multiple devices with the same Device Name.

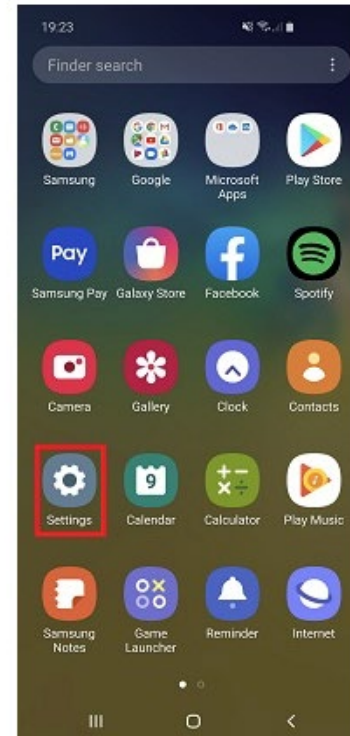
Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, p. 44 & 45

<https://web.archive.org/web/20170729135638/http://www.wi-fi.org/downloads-registered-guest/Wi-Fi+P2P+Technical+Specification+v1.7.pdf/29559>

Users of a 802.11 standard compatible transmitter and of Accused Transmitter Products could change or

customize the name of the 802.11 compatible device, for example as shown below in the context of a Samsung smartphone.

1 Open the **Settings** app



Samsung Support, *What is Bluetooth and how do I use it?*, (This identically includes 802.11 renaming)  
<http://web.archive.org/web/20200807093655/https://www.samsung.com/uk/support/mobile-devices/what-is-bluetooth/>

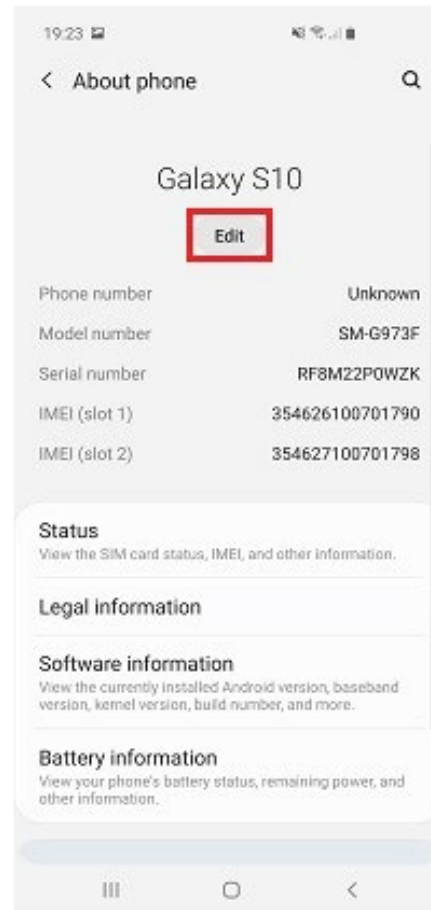
2 Tap About phone



Samsung Support, *What is Bluetooth and how do I use it?*, (This identically includes 802.11 renaming)  
<http://web.archive.org/web/20200807093655/https://www.samsung.com/uk/support/mobile-devices/what-is-bluetooth/>

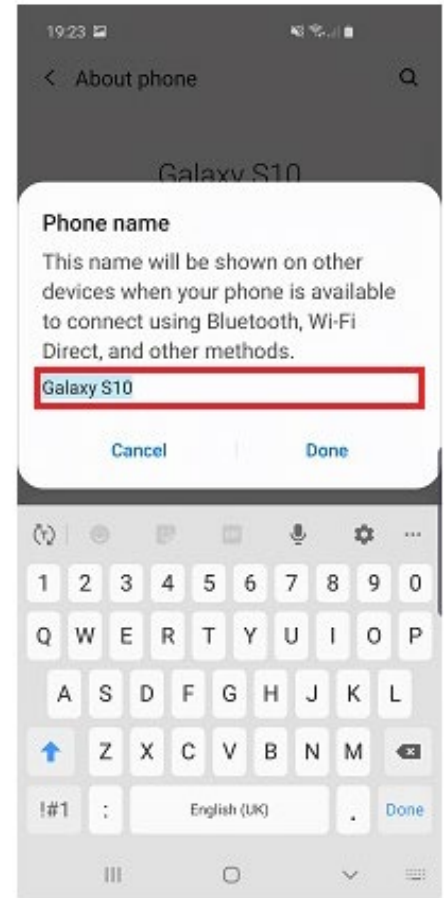
3

Tap Edit



Samsung Support, *What is Bluetooth and how do I use it?*, (This identically includes 802.11 renaming)  
<http://web.archive.org/web/20200807093655/https://www.samsung.com/uk/support/mobile-devices/what-is-bluetooth/>

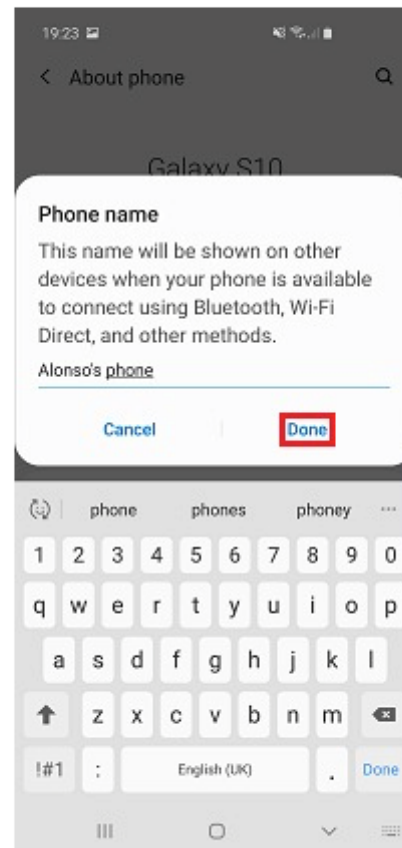
4 Choose a **Phone name**



Samsung Support, *What is Bluetooth and how do I use it?*, (This identically includes 802.11 renaming)  
<http://web.archive.org/web/20200807093655/https://www.samsung.com/uk/support/mobile-devices/what-is-bluetooth/>

5

Tap **Done** to confirm



Samsung Support, *What is Bluetooth and how do I use it?*, (This identically includes 802.11 renaming)  
<http://web.archive.org/web/20200807093655/https://www.samsung.com/uk/support/mobile-devices/what-is-bluetooth/>

### 3.1 P2P discovery

#### 3.1.1 Introduction

P2P Discovery enables P2P Devices to quickly find each other and form a connection.

P2P Discovery consists of the following major components:

- **Device Discovery** facilitates two P2P Devices arriving on a common channel and exchanging device information (e.g. device name and device type).

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, p. 25

<https://web.archive.org/web/20170729135638/http://www.wi-fi.org/downloads-registered-guest/Wi-Fi+P2P+Technical+Specification+v1.7.pdf/29559>

Device Name	variable	As defined in [2]	Friendly name of the P2P Device. Contains the entire WSC Device Name attribute in TLV format (see [2]). Note — Byte ordering within the Device Name field shall be big-endian.
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Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, p. 105

<https://web.archive.org/web/20170729135638/http://www.wi-fi.org/downloads-registered-guest/Wi-Fi+P2P+Technical+Specification+v1.7.pdf/29559>

Device Name	variable	As defined in [2]	Friendly name of the P2P Client. Contains the entire WSC Device Name attribute in TLV format (see [2]). Note — Byte ordering within the Device Name field shall be big-endian.
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Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, p. 107

<https://web.archive.org/web/20170729135638/http://www.wi-fi.org/downloads-registered-guest/Wi-Fi+P2P+Technical+Specification+v1.7.pdf/29559>

## Use Wi-Fi Direct without an Internet connection

Wi-Fi Direct-certified devices can be used for all kinds of applications - to share content, synch data, socialize, play games, play audio and video, and more - all the things you do with your Wi-Fi devices today, only easier and without worrying about finding an internet connection. Wi-Fi Direct-certified devices can form connections with nearly all the Wi-Fi CERTIFIED™ devices you already have. You only need one Wi-Fi Direct device to form a group. Now, Wi-Fi isn't just about accessing the internet - but about connecting all the Wi-Fi devices you and your friends have - anytime, anywhere - to enable your connected life.

<https://web.archive.org/web/20200320100420/https://wi-fi.org/discover-wi-fi/wi-fi-direct>

### Audio and Video

Video Playing Format	Video Playing Resolution	Audio Playing Format
MP4, M4V, 3GP, 3G2, WMV, ASF, AVI, FLV, MKV, WEBM	UHD 4K (3840 x 2160)@120fps	MP3, M4A, 3GA, AAC, OGG, OGA, WAV, WMA, AMR, AWB, FLAC, MID, MIDI, XMF, MXMF, IMY, RTTTL, RTX, OTA

The audio formats compatible with the wireless connection are of high quality, e.g., “Audio Playing Format.”

<https://www.samsung.com/levant/tablets/galaxy-tab-a/galaxy-tab-active3-8-inch-black-64gb-lte-sm-t575nzkamid/>

In order to promote efficient wireless medium use when operating outside DMG:

- P2P Devices shall not use 11b rates (1, 2, 5.5, 11 Mbps) for data and management frames except:
  - Probe Request frames sent to both P2P Devices and non-P2P Devices.
- P2P Devices shall not respond to Probe Request frames that indicate support for 11b rates only.

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, p. 22

<https://web.archive.org/web/20170729135638/http://www.wi-fi.org/downloads-registered-guest/Wi-Fi+P2P+Technical+Specification+v1.7.pdf/29559>

A P2P Device may simultaneously scan for P2P Groups and legacy networks (i.e. 802.11 infrastructure networks). The WSC IE shall be included in all Probe Request frames, with Device Name, Primary Device Type and Device

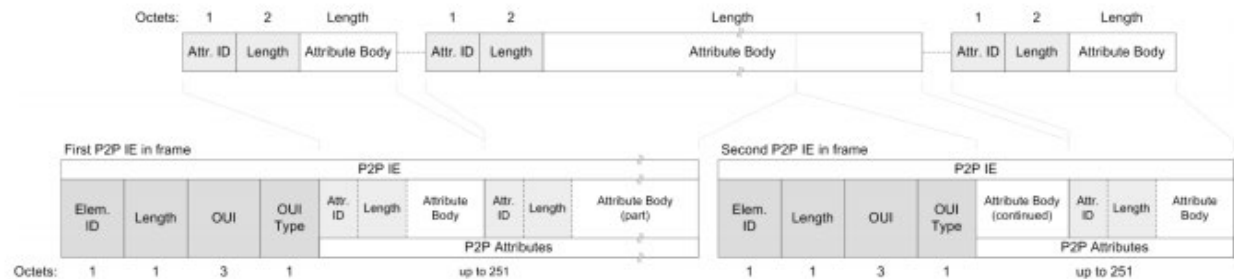
Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, p. 28

<https://web.archive.org/web/20170729135638/http://www.wi-fi.org/downloads-registered-guest/Wi-Fi+P2P+Technical+Specification+v1.7.pdf/29559>

A P2P Device shall include the WSC IE in all transmitted Beacon, Announce, Probe Request and Response frames. A P2P Device operating within DMG may include the WSC IE in transmitted DMG Beacon frames (see Section 4.3.1) Both the Device Name and Primary Device Type are required attributes in the WSC IE. The Secondary Device Type List is an optional attribute in the WSC IE. The inclusion of the WSC IE in the Probe Response frame sent by a P2P Device allows it to advertise human-readable device-specific information. It should be noted that this information is openly advertised.

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, p. 61

<https://web.archive.org/web/20170729135638/http://www.wi-fi.org/downloads-registered-guest/Wi-Fi+P2P+Technical+Specification+v1.7.pdf/29559>



**Figure 22—Example of P2P attributes carried in two P2P IEs**

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, p. 92

<https://web.archive.org/web/20170729135638/http://www.wi-fi.org/downloads-registered-guest/Wi-Fi+P2P+Technical+Specification+v1.7.pdf/29559>

### 7.3 Management frame body components

#### 7.3.1 Fixed fields

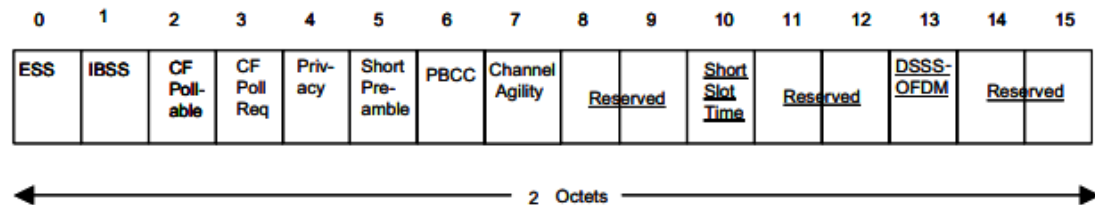
##### 7.3.1.4 Capability Information field

*Change the first and second paragraphs in 7.3.1.4 as shown:*

The Capability Information field contains a number of subfields that are used to indicate requested or advertised optional capabilities.

The length of the Capability Information field is 2 octets. The Capability Information field consists of the following subfields: ESS, IBSS, CF-Pollable, CF-Poll Request, Privacy, Short Preamble, Packet Binary Convolutional Code (PBCC), and Channel Agility, Short Slot Time, and DSSS-OFDM. The format of the Capability Information field is illustrated in Figure 27. No subfield is supplied for ERP as a STA supports ERP operation if it includes all of the Clause 19 mandatory rates in its supported rate set.

*Replace Figure 27 with the following:*



**Figure 27—Capability Information fixed field**

This supports spread spectrum in 802.11b and 802.11g (pg. 6 of 802.11g) in Wi-Fi Direct

IEEE Std 802.11g-2003 LOCAL AND METROPOLITAN AREA NETWORKS, p. 6

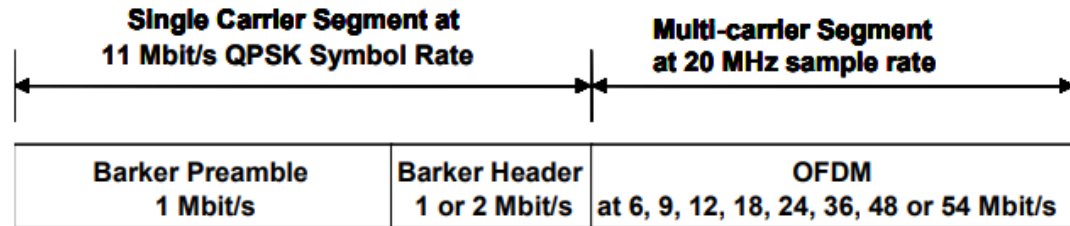
<https://ieeexplore.ieee.org/document/1210624>

This is at least, in part, a software limitation, and the software and source code of the Accused Transmitter Products are not publicly available. Plaintiff reserves the right to supplement these infringement contentions following a review of this software and source code.

8 [A] encoding operative to encode said original audio signal representation to reduce intersymbol interference and aid in lowering signal detection error of said audio representation signal respective to said receiver and mobile said transmitter coupled to said music audio source;

The Accused Transmitter Devices each comprise an encoding operative to encode said original audio signal representation to reduce intersymbol interference and aid in lowering signal detection error of said audio representation signal respective to said receiver and mobile said transmitter coupled to said music audio source.

The Accused Transmitter Products comprise of an encoder to encode the transmissions to reduce intersymbol interference (ISI). Pulse shaping in 802.11b and 802.11g reduces ISI.



- Ideal Transition Specification**
- **Constant Power**
  - **Constant Spectrum**
  - **Constant Frequency and Phase**
  - **Constant Timing**

**Figure 153G—Single carrier to multicarrier transition definition**

IEEE Std 802.11g-2003 LOCAL AND METROPOLITAN AREA NETWORKS, p. 32  
<https://ieeexplore.ieee.org/document/1210624>

### **19.7.2.1 Spectral binding requirement**

The spectral binding requirement allows the receiver's estimate of the channel state information to be transferred from the single-carrier packet segment to the multicarrier packet segment. This requirement establishes a coherent relationship between the end-to-end frequency responses of the single carrier and multicarrier segments.

During reception of the single carrier preamble and header, the receiver may estimate the channel impulse response. In practice, this could be accomplished through Barker code correlation. The channel impulse response contains end-to-end frequency response information about the linear distortion experienced by the signal due to filters and multipath. This distortion can be mitigated with an equalizer or other commonly known techniques.

The channel impulse response estimate generated during the single carrier packet segment will include the single carrier's pulse-shaping, filter frequency response used to control the single carrier's transmit spectrum and transmit impulse response. The single carrier's pulse-shaping filter may be distinct from the shaping technique used for the multicarrier segment.

The spectral binding requirement states that the linear distortions experienced by the single carrier signal and the linear distortions experienced by the multicarrier signal have a known relationship. This relationship is defined by this specification and shall be manifested by all compliant transmit radios. This will allow any receiver to exploit channel information derived during the single carrier segment and reuse the channel information during the multicarrier segment, if desired.

Three elements have been itemized for this specification to achieve spectral binding. All three elements are necessary to achieve spectral binding, and they are discussed in the next three subclauses. The first element focuses on distortions common to both the single carrier packet segment and the multicarrier packet segment. The second element deals with pulse-shaping unique to the OFDM packet segment. The third element deals with pulse-shaping unique to the single carrier packet segment. The multicarrier pulse shape discussion precedes the single carrier's pulse shape discussion because it is believed this will be a more comfortable progression, due to similar multicarrier pulse-shaping considerations contained in Clause 17.

IEEE Std 802.11g-2003 LOCAL AND METROPOLITAN AREA NETWORKS, p. 32  
<https://ieeexplore.ieee.org/document/1210624>

### 3.1 P2P discovery

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- **Device Discovery** facilitates two P2P Devices arriving on a common channel and exchanging device information (e.g. device name and device type).

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, p. 25

<https://web.archive.org/web/20170729135638/http://www.wi-fi.org/downloads-registered-guest/Wi-Fi+P2P+Technical+Specification+v1.7.pdf/29559>

Device Name	variable	As defined in [2]	Friendly name of the P2P Device. Contains the entire WSC Device Name attribute in TLV format (see [2]). Note — Byte ordering within the Device Name field shall be big-endian.
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Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, p. 105

<https://web.archive.org/web/20170729135638/http://www.wi-fi.org/downloads-registered-guest/Wi-Fi+P2P+Technical+Specification+v1.7.pdf/29559>

Device Name	variable	As defined in [2]	Friendly name of the P2P Client. Contains the entire WSC Device Name attribute in TLV format (see [2]). Note — Byte ordering within the Device Name field shall be big-endian.
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Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, p. 107

<https://web.archive.org/web/20170729135638/http://www.wi-fi.org/downloads-registered-guest/Wi-Fi+P2P+Technical+Specification+v1.7.pdf/29559>

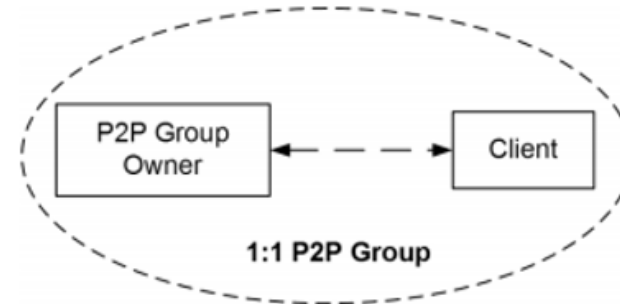
	<p style="text-align: center;"><b>Use Wi-Fi Direct without an Internet connection</b></p> <p>Wi-Fi Direct-certified devices can be used for all kinds of applications - to share content, synch data, socialize, play games, play audio and video, and more - all the things you do with your Wi-Fi devices today, only easier and without worrying about finding an internet connection. Wi-Fi Direct-certified devices can form connections with nearly all the Wi-Fi CERTIFIED™ devices you already have. You only need one Wi-Fi Direct device to form a group. Now, Wi-Fi isn't just about accessing the internet - but about connecting all the Wi-Fi devices you and your friends have - anytime, anywhere - to enable your connected life.</p> <p><a href="https://web.archive.org/web/20200320100420/https://wi-fi.org/discover-wi-fi/wi-fi-direct">https://web.archive.org/web/20200320100420/https://wi-fi.org/discover-wi-fi/wi-fi-direct</a></p> <div style="border: 1px dashed gray; padding: 5px;"> <p style="text-align: center;"><b>Audio and Video</b> <span style="float: right;">^</span></p> <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Video Playing Format</th> <th style="text-align: left; border-bottom: 1px solid black;">Video Playing Resolution</th> <th style="text-align: left; border-bottom: 1px solid black;">Audio Playing Format</th> </tr> </thead> <tbody> <tr> <td>MP4, M4V, 3GP, 3G2, WMV, ASF, AVI, FLV, MKV, WEBM</td> <td>UHD 4K (3840 x 2160)@120fps</td> <td>MP3, M4A, 3GA, AAC, OGG, OGA, WAV, WMA, AMR, AWB, FLAC, MID, MIDI, XMF, MXMF, IMY, RTTTL, RTX, OTA</td> </tr> </tbody> </table> <p>The audio formats compatible with the wireless connection are of high quality, e.g., “Audio Playing Format.”</p> <p><a href="https://www.samsung.com/levant/tablets/galaxy-tab-a/galaxy-tab-active3-8-inch-black-64gb-lte-sm-t575nzkamid/">https://www.samsung.com/levant/tablets/galaxy-tab-a/galaxy-tab-active3-8-inch-black-64gb-lte-sm-t575nzkamid/</a></p> <p><a href="https://web.archive.org/web/20210731123746/https://www.samsung.com/us/business/mobile/tablets/galaxy-tab-active/explore/">https://web.archive.org/web/20210731123746/https://www.samsung.com/us/business/mobile/tablets/galaxy-tab-active/explore/</a></p> <p>This is at least, in part, a software limitation, and the software and source code of the Accused Transmitter Products are not publicly available. Plaintiff reserves the right to supplement these infringement contentions following a review of this software and source code.</p> </div>	Video Playing Format	Video Playing Resolution	Audio Playing Format	MP4, M4V, 3GP, 3G2, WMV, ASF, AVI, FLV, MKV, WEBM	UHD 4K (3840 x 2160)@120fps	MP3, M4A, 3GA, AAC, OGG, OGA, WAV, WMA, AMR, AWB, FLAC, MID, MIDI, XMF, MXMF, IMY, RTTTL, RTX, OTA
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<p><b>8 [B]</b> a digital modulator module configured for independent code division multiple access communication operation, wherein each user has their own</p>	<p>The Accused Transmitter Products comprise of a digital modulator module configured for independent code division multiple access communication operation, wherein each user has their own separate transmitter configured to communicate with their receiver. The transmitter is configured to wirelessly transmit the audio to be reproduced virtually free from interference from transmission and reception device signals operating in the wireless digital audio transmitter shared spectrum.</p>						

separate transmitter configured to communicate with their receiver, said transmitter configured to wirelessly transmit said audio to be reproduced virtually free from interference from transmission and reception device signals operating in the wireless digital audio transmitter shared spectrum.

At the transmitter's end it modulates the transmissions to be demodulated at the receiver's end.

**A P2P Group has a single SSID and provides one security domain.**

**Figure 3 illustrates a 1:1 topology, which is a subset of P2P 1:n topology (n=1).**



**Figure 3—A subset of P2P 1:n topology (n=1)**

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, p. 20 & 21

<https://web.archive.org/web/20170729135638/http://www.wi-fi.org/downloads-registered-guest/Wi-Fi+P2P+Technical+Specification+v1.7.pdf/29559>

**Abstract:**

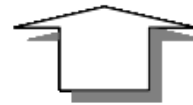
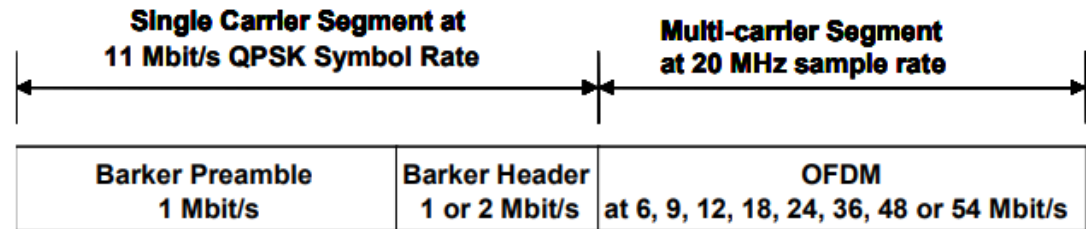
This paper proposes a low-power ASIC design of pseudonoise code synchronization for wireless code-division multiple access (WCDMA), CDMA2000, and IEEE 802.11 g systems. WCDMA and CDMA 2000 are two major standards in third-generation (3G) communication systems. Since 3G and 802.11 g are based on the same CDMA technology, there are common parts in the code synchronization hardware. We integrate the three systems on one ASIC. In addition, we use three kinds of low-power techniques in the design that include power management, absolute weighted magnitude calculation, and spurious power suppression adder. They can save 57.37% power consumption in WCDMA synchronization, 6.06% power consumption in CDMA2000 synchronization, and 84.69% power consumption in 802.11 g synchronization. The low-power synchronizer is implemented with an operating voltage of 1.2 V, 0.13- $\mu\text{m}$  CMOS technology, and chip area of 2.1times 2.1  $\text{mm}^2$ .

<https://ieeexplore.ieee.org/document/4539779>

Spread Spectrum Systems with Commercial Applications, 3<sup>rd</sup> Ed., by Robert C. Dixon: “Code division multiple access. Any signal multiplexing technique using codes to separate signals.”

The received unique user code (unique friendly name) is used to communicate only with the digital audio spread spectrum transmitter in a 802.11 (Wi-Fi Direct) device “paired” with the respective Accused Receiver Product.

The 802.11 (Wi-Fi Direct) specification discloses 802.11b (using DSSS) and 802.11g (including DSSS + OFDM), thus the below figure illustrates, at least, a multiplexing technique with a DSSS code separating signals. Furthermore, another example can be the unique user code (unique friendly name -a UTF-8 encoding) used that can separate signals.



**Ideal Transition Specification**

- **Constant Power**
- **Constant Spectrum**
- **Constant Frequency and Phase**
- **Constant Timing**

**Figure 153G—Single carrier to multicarrier transition definition**

IEEE Std 802.11g-2003 LOCAL AND METROPOLITAN AREA NETWORKS, p. 32  
<https://ieeexplore.ieee.org/document/1210624>

### **19.7.2.1 Spectral binding requirement**

The spectral binding requirement allows the receiver's estimate of the channel state information to be transferred from the single-carrier packet segment to the multicarrier packet segment. This requirement establishes a coherent relationship between the end-to-end frequency responses of the single carrier and multicarrier segments.

During reception of the single carrier preamble and header, the receiver may estimate the channel impulse response. In practice, this could be accomplished through Barker code correlation. The channel impulse response contains end-to-end frequency response information about the linear distortion experienced by the signal due to filters and multipath. This distortion can be mitigated with an equalizer or other commonly known techniques.

The channel impulse response estimate generated during the single carrier packet segment will include the single carrier's pulse-shaping, filter frequency response used to control the single carrier's transmit spectrum and transmit impulse response. The single carrier's pulse-shaping filter may be distinct from the shaping technique used for the multicarrier segment.

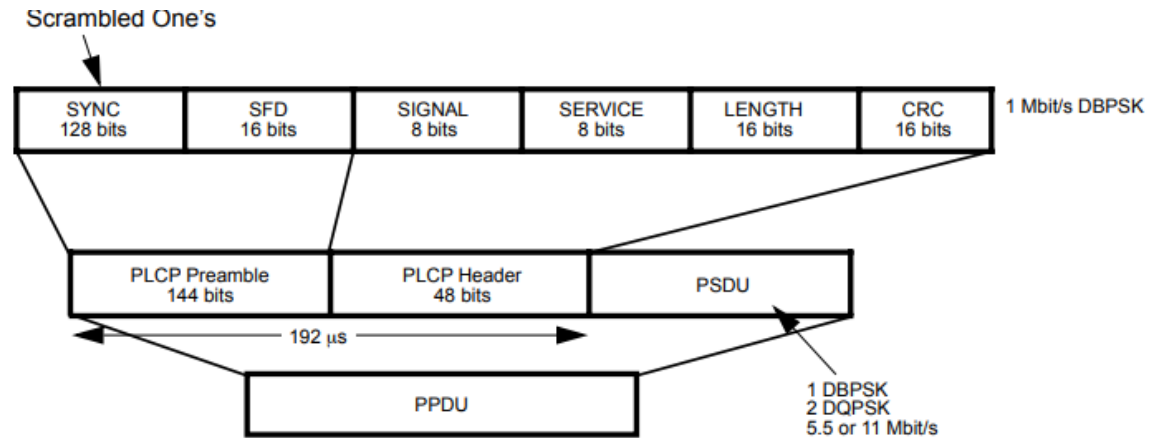
The spectral binding requirement states that the linear distortions experienced by the single carrier signal and the linear distortions experienced by the multicarrier signal have a known relationship. This relationship is defined by this specification and shall be manifested by all compliant transmit radios. This will allow any receiver to exploit channel information derived during the single carrier segment and reuse the channel information during the multicarrier segment, if desired.

Three elements have been itemized for this specification to achieve spectral binding. All three elements are necessary to achieve spectral binding, and they are discussed in the next three subclauses. The first element focuses on distortions common to both the single carrier packet segment and the multicarrier packet segment. The second element deals with pulse-shaping unique to the OFDM packet segment. The third element deals with pulse-shaping unique to the single carrier packet segment. The multicarrier pulse shape discussion precedes the single carrier's pulse shape discussion because it is believed this will be a more comfortable progression, due to similar multicarrier pulse-shaping considerations contained in Clause 17.

IEEE Std 802.11g-2003 LOCAL AND METROPOLITAN AREA NETWORKS, p. 32  
<https://ieeexplore.ieee.org/document/1210624>

The receiver shall implement the CCA procedure as defined in 18.4.8.4. Upon receiving a PPDU, the receiver shall distinguish between a long and short header format by the value of the SFD, as specified in 18.2.2. The receiver shall demodulate a long PLCP header using BPSK at 1 Mbit/s. The receiver shall demodulate a short PLCP header using QPSK at 2 Mbit/s. The receiver shall use the SIGNAL and SERVICE fields of the PLCP header to determine the data rate and modulation of the PSDU.

IEEE Std 802.11b-1999 SUPPLEMENT TO IEEE STANDARD FOR INFORMATION TECHNOLOGY, p. 24  
<https://standards.ieee.org/ieee/802.11b/1166/>



**Figure 127—Long PLCP PPDU format**


**18.2.2.2 Short PLCP PPDU format (optional)**

IEEE Std 802.11b-1999 SUPPLEMENT TO IEEE STANDARD FOR INFORMATION TECHNOLOGY, p. 13  
<https://standards.ieee.org/ieee/802.11b/1166/>

This is at least, in part, a software limitation, and the software and source code of the Accused Transmitter Products are not publicly available. Plaintiff reserves the right to supplement these infringement contentions following a review of this software and source code.

<b>Claim 10</b>	<b>Evidence</b>
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<p><b>10. [Pre]</b> A wireless digital coded audio spread spectrum transmitter operatively coupled to a audio source and configured to transmit a unique user code and an original audio signal representation in the form of packets, wherein said digital coded audio transmitter coupled to said audio source, and configured to be directly communicable with a mobile digital audio spread spectrum receiver, is capable of being moved in any direction during operation, said wireless digital coded audio transmitter comprising:</p>	<p>The Accused Transmitter Products are wireless digital coded audio spread spectrum transmitter operatively coupled to a audio source and configured to transmit a unique user code and an original audio signal representation in the form of packets, wherein the digital coded audio transmitter is coupled to the audio source, and configured to be directly communicable with a mobile digital audio spread spectrum receiver, is capable of being moved in any direction during operation, being a wireless digital coded audio transmitter .</p> <p>See Claim <b>8[Pre]</b> above.</p> <p>This is at least, in part, a software limitation, and the software and source code of the Accused Transmitter Products are not publicly available. Plaintiff reserves the right to supplement these infringement contentions following a review of this software and source code.</p>
<p><b>10 [A]</b> an encoding module operative to encode said original audio signal representation to reduce intersymbol interference and aid in lowering signal detection error of said audio signal representation, said transmitter coupled to said audio source;</p>	<p>The Accused Transmitter Devices each comprise an encoding module operative to encode the original audio signal representation to reduce intersymbol interference and aid in lowering signal detection error of the audio signal representation and the transmitter coupled to said audio source.</p> <p>See Claim <b>8[A]</b> above.</p> <p>This is at least, in part, a software limitation, and the software and source code of the Accused Transmitter Products are not publicly available. Plaintiff reserves the right to supplement these infringement contentions following a review of this software and source code.</p>
<p><b>10 [B]</b> a digital modulator module configured for independent code division multiple access communication operation, each user has their own separate transmitter configured to communicate with their receiver, said transmitter configured to wirelessly transmit said audio to be reproduced</p>	<p>The Accused Transmitter Products comprise of a digital modulator module configured for independent code division multiple access communication operation, each user has their own separate transmitter configured to communicate with their receiver. The transmitter is configured to wirelessly transmit the audio to be reproduced virtually free from interference from transmission and reception device signals operating in the wireless digital audio transmitter shared spectrum.</p> <p>See Claim <b>8[B]</b> above.</p>

<p>virtually free from interference from transmission and reception device signals operating in the wireless digital audio transmitter shared spectrum.</p>	<p>This is at least, in part, a software limitation, and the software and source code of the Accused Transmitter Products are not publicly available. Plaintiff reserves the right to supplement these infringement contentions following a review of this software and source code.</p>
<p><b>Claim 11</b></p>	<p><b>Evidence</b></p>
<p><b>11. [Pre]</b> The wireless digital audio receiver of claim 8, wherein the spread spectrum receiver module is further configured to utilize differential phase shift keying (DPSK) to demodulate said audio signal representation.</p>	<p>The Accused Receiver Products comprise a wireless digital audio receiver of claim 8, wherein the spread spectrum receiver module is further configured to utilize differential phase shift keying (DPSK) to demodulate the audio signal representation.</p> <p>At the receiver's end it demodulates the transmissions modulated at the transmitter end.</p>  <p><a href="https://www.samsung.com/levant/tablets/galaxy-tab-a/galaxy-tab-active3-8-inch-black-64gb-lte-sm-t575nzkamid/">https://www.samsung.com/levant/tablets/galaxy-tab-a/galaxy-tab-active3-8-inch-black-64gb-lte-sm-t575nzkamid/</a></p> <p><a href="https://web.archive.org/web/20210731123746/https://www.samsung.com/us/business/mobile/tablets/galaxy-tab-active/explore/">https://web.archive.org/web/20210731123746/https://www.samsung.com/us/business/mobile/tablets/galaxy-tab-active/explore/</a></p>

## Connectivity

<b>ANT+</b> No	<b>USB Version</b> USB 3.1 Gen 1	<b>Location Technology</b> GPS, Glonass, Beidou, Galileo	<b>Earjack</b> 3.5mm Stereo
<b>MHL</b> No	<b>Wi-Fi</b> 802.11 a/b/g/n/ac/ax 2.4G+5GHz, HE80, MIMO, 1024-QAM	<b>Wi-Fi Direct</b> Yes	<b>Bluetooth Version</b> Bluetooth v5.0
<b>NFC</b> Yes	<b>Bluetooth Profiles</b> A2DP, AVRCP, HFP, HID, HOGP, HSP, MAP, OPP, PAN, PBAP	<b>PC Sync.</b> Smart Switch (PC version)	

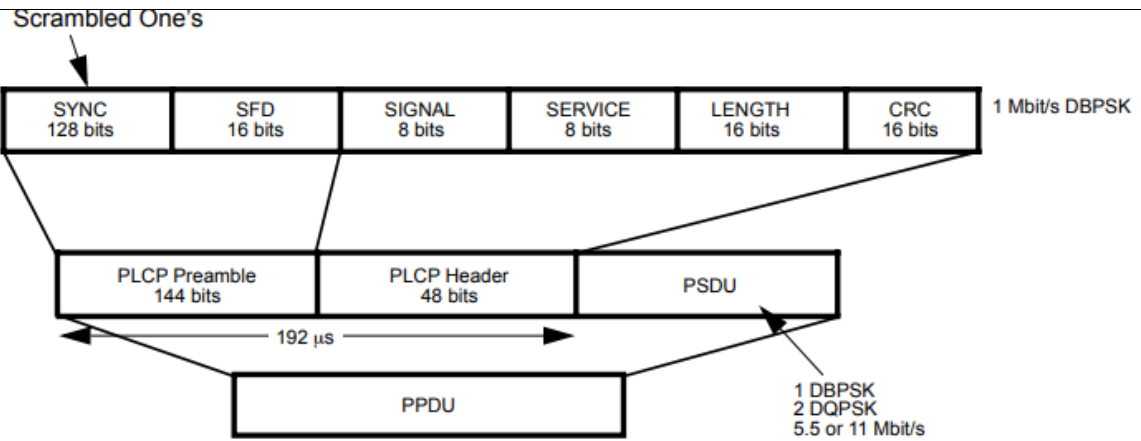
<https://www.samsung.com/levant/tablets/galaxy-tab-a/galaxy-tab-active3-8-inch-black-64gb-lte-sm-t575nzkamid/>

<https://web.archive.org/web/20210731123746/https://www.samsung.com/us/business/mobile/tablets/galaxy-tab-active/explore/>

### 18.1 Overview

This clause specifies the High Rate extension of the PHY for the Direct Sequence Spread Spectrum (DSSS) system (Clause 15 of IEEE Std 802.11, 1999 Edition), hereinafter known as the High Rate PHY for the 2.4 GHz band designated for ISM applications.

IEEE Std 802.11b-1999 SUPPLEMENT TO IEEE STANDARD FOR INFORMATION TECHNOLOGY, p. 11  
<https://standards.ieee.org/ieee/802.11b/1166/>



**Figure 127—Long PLCP PPDU format**

**18.2.2.2 Short PLCP PPDU format (optional)**

IEEE Std 802.11b-1999 SUPPLEMENT TO IEEE STANDARD FOR INFORMATION TECHNOLOGY, p. 13  
<https://standards.ieee.org/ieee/802.11b/1166/>

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Claim 12	Evidence
<p><b>12. [Pre]</b> The wireless digital audio receiver of claim 10, wherein the spread spectrum receiver module is further configured to utilize differential phase shift keying (DPSK) to demodulate said audio signal representation.</p>	<p>The Accused Receiver Products comprise a wireless digital audio receiver of claim 10, wherein the spread spectrum receiver module is further configured to utilize differential phase shift keying (DPSK) to demodulate the audio signal representation.</p> <p>See Claim 11 above.</p> <p>This is at least, in part, a software limitation, and the software and source code of the Accused Transmitter Products are not publicly available. Plaintiff reserves the right to supplement these infringement contentions following a review of this software and source code.</p>

