

METHOD FOR TRANSMITTING HE-LTF SEQUENCE AND APPARATUS

[0001] This application claims priority to Chinese Patent Application No. 201510532381.2, filed with the Chinese Patent Office on August 26, 2015 and entitled "INFORMATION TRANSMISSION METHOD, ACCESS POINT, AND STATION", and Chinese Patent Application No. 201510849062.2, filed with the Chinese Patent Office on November 26, 2015 and entitled "METHOD FOR TRANSMITTING HE-LTF SEQUENCE AND APPARATUS", which are incorporated herein by reference in their entireties.

TECHNICAL FIELD

[0002] The present invention relates to the field of wireless communications technologies, and more specifically, to a method for transmitting an HE-LTF sequence and an apparatus.

BACKGROUND

[0003] With development of the mobile Internet and popularization of smart terminals, data traffic grows rapidly. With advantages of a high rate and low costs, a wireless local area network (WLAN) becomes one of the mainstream mobile broadband access technologies.

[0004] To significantly improve a service transmission rate of a WLAN system, in the next-generation Institute of Electrical and Electronics Engineers (IEEE) 802.11ax standard, on the basis of an existing orthogonal frequency division multiplexing (OFDM) technology, an orthogonal frequency division multiple access (OFDMA) technology is further used. In the OFDMA technology, a time-frequency resource of an air interface radio channel is divided into multiple orthogonal time-frequency resource blocks (RB, Resource Block); the RBs may be shared in a time domain, and may be orthogonal in a frequency domain.

[0005] In an existing WiFi system (for example, 11n or 11ac), a terminal still performs channel access by using a contention manner of carrier sense with collision avoidance. When a quantity of users increases, because channel access collisions increase, a system average throughput drops rapidly. In current work of a new WiFi standard (11ax), it is already decided to introduce an

OFDMA technology in a WiFi system, to achieve an objective of improving a system average throughput in a high-density scenario. As an important part used for channel estimation in the existing WiFi system, an LTF also continues to be used in an OFDMA mode in the new WiFi standard. Therefore, in the OFDMA mode, a manner of generating an LTF becomes a research focus.

5 **[0006]** In the prior art, an 80-MHz LTF or a 160-MHz LTF in the 802.11ac standard is used as a basic template, from which values in a carrier part corresponding to a resource block scheduled by a user in an OFDMA mode are extracted, and values in a carrier part that does not correspond to the resource block are padded with 0s, so as to generate an LTF used by the user in the OFDMA mode. However, when a method in the prior art is used, a peak to average power ratio (PAPR) is relatively
10 high.

SUMMARY

[0007] Embodiments of the present invention provide a method for sending wireless local area network information, so as to reduce a peak-to-average power ratio.

[0008] According to one aspect, a method for sending wireless local area network information is
15 provided, including:

obtaining a corresponding HE-LTF sequence according to a bandwidth, where the HE-LTF sequence is specifically a sequence in each embodiment; and

sending a corresponding sequence segment in the HE-LTF sequence according to a size and a location of an RU allocated to a station.

20 **[0009]** According to another aspect, a method for receiving a wireless local area network PPDU is provided, including:

receiving a PPDU, and obtaining a total transmission bandwidth indicated in the PPDU;

obtaining a corresponding HE-LTF sequence according to the bandwidth, where the HE-LTF sequence is specifically a sequence in each embodiment; and

25 selecting, according to a size and a location of an RU, a corresponding HE-LTF sequence segment, as a reference sequence of the RU for channel estimation, at a receive end, .

[0010] Correspondingly, an apparatus configured to execute the foregoing method is provided, and the apparatus is, for example, an AP, a STA, or a corresponding chip.

[0011] An HE-LTF sequence provided in an embodiment of the present invention is used, so that
30 a next-generation wireless local area network has a relatively low PAPR.

[0026] FIG. 15 is a block diagram of an access point according to an embodiment of the present invention; and

[0027] FIG. 16 is a block diagram of a station according to an embodiment of the present invention.

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DESCRIPTION OF EMBODIMENTS

[0028] The following clearly and completely describes the technical solutions in the embodiments of the present invention with reference to the accompanying drawings in the embodiments of the present invention. Apparently, the described embodiments are a part rather than all of the embodiments of the present invention. All other embodiments obtained by a person of ordinary skill
10 in the art based on the embodiments of the present invention without creative efforts shall fall within the protection scope of the present invention.

[0029] For ease of understanding, terms that may appear in the following embodiments are described as follows:

15	AP	Access point
	HEW	High efficiency WLAN
	HE-LTF	High efficiency Long training field
	OFDMA	Orthogonal Frequency Division Multiple Access
	STA	Station
	WLAN	Wireless Local Area Networks

20 **[0030]** An access point (AP) may also be referred to as a wireless access point, a bridge, a hotspot, or the like, and may be an access server or a communications network.

[0031] A station (STA) may be further referred to as a user, and may be a wireless sensor, a wireless communications terminal, or a mobile terminal, for example, a mobile telephone (or referred to as a "cellular" phone) that supports a WiFi communication function and a computer that has a
25 wireless communication function. For example, the station may be a portable, pocket-sized, handheld, computer built-in, wearable, or in-vehicle wireless communications apparatus that supports the WiFi communication function, and exchanges communication data such as voice and data with a wireless access network.

[0032] The next-generation wireless local area network standard 802.11ax intends to further
30 improve WLAN spectrum efficiency, a throughput of an area, actual user experience, and performance in various indoor and outdoor dense network deployment environments. In addition,

the solution is further required to suppress interference between devices and meet large-scale and high-load networking requirements. In conventional WiFi, an indoor channel is mainly used, an OFDM transmission manner is used, a symbol length is $3.2 \mu s$, and a subcarrier spacing is $1/3.2 \mu s = 312.5 \text{ kHz}$. In 20 MHz, a 64-FFT is used to generate an OFDM symbol, and among all 56 subcarriers, there are 52 data subcarriers and 4 subcarriers. In 40 MHz, a 128-FFT is used to generate an OFDM symbol, and among all 128 subcarriers, there are 108 data subcarriers and 6 subcarriers. When a 256-FFT is used to generate an OFDM symbol, among all 256 subcarriers, there are 234 data subcarriers and 8 subcarriers.

[0033] For an 802.11ax system, to support indoor and outdoor scenarios, a symbol length ($4 \times 3.2 \mu s = 12.8 \mu s$) that is 4 times a symbol length in 802.11ac may be used, and a subcarrier spacing is $312.5/4 = 78.125 \text{ kHz}$. To support OFDMA transmission, a tone plan (distribution of subcarriers that carry data) below is used, and location relationships between different resource blocks (RU) are shown in FIG. 1a to FIG. 1c, where an arrow indicates a location of a leftover tone between RUs. A quantity of subcarriers of a large RU is the same as a total sum of a quantity of subcarriers of multiple small RUs that may be correspondingly accommodated by the large RU and a quantity of leftover subcarriers between small RUs.

[0034] Referring to FIG. 1a, FIG. 1a is a simple schematic diagram of "tone plan" that may be allocated in OFDMA in 20 MHz; FIG. 1b is a simple schematic diagram of locations of OFDMA resource blocks in 40 MHz; and FIG. 1c is a simple schematic diagram of locations of OFDMA resource blocks in 80 MHz. An OFDMA multi-user data packet in 802.11ax is formed by resource blocks (RU) of various sizes. An AP allocates one RU to each user. An optional RU that may be allocated to a user is:

1) an RU formed by 26 consecutive subcarriers, comprising: 24 data subcarriers and 2 pilot subcarriers;

2) an RU formed by 52 consecutive subcarriers, comprising: 48 data subcarriers and 4 pilot subcarriers;

3) an RU formed by 106 consecutive subcarriers, comprising: 102 data subcarriers and 4 pilot subcarriers;

4) an RU formed by 242 consecutive subcarriers, comprising: 234 data subcarriers and 8 pilot subcarriers;

5) an RU formed by 484 consecutive subcarriers, comprising: 468 data subcarriers and 16 pilot subcarriers; and

6) an RU formed by 996 consecutive subcarriers, comprising: 980 data subcarriers and

16 pilot subcarriers.

[0035] A 484-RU is used in multi-user transmission of 40 MHz, and an 996-RU is used in multi-user transmission of 80/160 MHz. It may be learned that 160 MHz is formed by two 80-MHz tone plans. Locations of pilot subcarriers indicated by arrows in FIG. 1a, FIG. 1b, and FIG. 1c are locations of the foregoing pilot subcarriers.

[0036] In addition, in an 802.11ax system, for an HE-LTF used for channel estimation, a 2x mode and a 4x mode are used. The 4x mode means that subcarrier indexes, mapped by an 4x HE-LTF sequence, is the same as subcarrier indexes mapped by a resource block distribution (tone plan) of a data part. The 2x mode means that, indexes of a 2x HE-LTF sequence corresponds to indexes of a 4x HE-LTF sequence divided by 2. That is, subcarrier indexes, mapped by an 2x HE-LTF sequence, is as half of subcarrier indexes, mapped by a resource block distribution (tone plan) of a data part.

[0037] In the 802.11ax system, a tone plan of OFDMA transmission is different from a tone plan of OFDM in an existing 802.11ac system. Therefore, a VHT-LTF sequence of 20/40 defined in 802.11ac is inapplicable. In a specific case, a total subcarrier quantity 242 of 80 MHz in 802.11ac is the same as a total subcarrier quantity of 20 MHz in 802.11ax. However, it is found that when a VHT-LTF sequence is directly used in an 802.11ax 20-MHz bandwidth, a peak-to-average power ratio (PAPR) is relatively high.

[0038] Referring to FIG. 2a and FIG. 2b, it may be learned that if a VHT-LTF of 802.11ac 80 MHz is used in 802.11ax 20 MHz, a PAPR of the VHT-LTF is significantly increased as compared with a PAPR of a conventional LTF sequence, which affects power control efficiency, and further reduces precision of channel estimation.

[0039] In addition, for a tone plan of 802.11ax in 40/80 MHz, a quantity of subcarriers already exceeds a conventional sequence, and a VHT-LTF sequence of 802.11ac cannot be reused.

[0040] FIG. 3 is a simple schematic diagram of a WLAN system applied in an embodiment of the present invention. The system in FIG. 3 includes one or more access points APs 101 and one or more stations STAs 102. The access points 101 and the stations 102 perform wireless communication by using an OFDMA technology.

[0041] Referring to FIG. 4, FIG. 4 shows a possible frame structure of a data packet PPDU sent by an AP in the foregoing downlink WLAN system. In a specific example, the frame structure complies with related regulations in 802.11ax.

[0042] According to a data structure of a PPDU shown in FIG. 4, for a downlink multi-user PPDU sent by the AP, an HE-SIG-A includes information used to indicate a transmission bandwidth of a downlink user STA, and an HE-SIG-B includes information used to indicate a size and a

location of an RU allocated to a downlink scheduled user, or further includes a STA ID corresponding to each scheduled user and other scheduling information such as a spatial flow number or modulation and coding mode. In an example, the HE-SIG-A or the HE-SIG-B may further comprise: an HE-LTF length, that is, a quantity N of symbols of an HE-LTF, used to instruct to perform alignment of multiple users.

[0043] In an additional embodiment, for each RU in a tone plan of OFDMA of an HE-LTF, a quantity of pilot subcarriers, locations of the pilot subcarriers, and a sending manner are given. For corresponding content, refer to Motion #3, October 29, 2014, Removed with Motion 10, March 6, 2015 below.

[0044] For example, referring to FIG. 5a, FIG. 5b, FIG. 5c, and FIG. 5d, on the basis of the tone plans shown in FIG. 1a, FIG. 1b, and FIG. 1c, locations of pilot subcarriers are given, that is, locations indicated by long arrows in FIG. 5a, FIG. 5b, FIG. 5c, and FIG. 5d. For example, the sending manner is: in single-user transmission, uplink and downlink OFDMA transmission, and downlink MU-MIMO transmission, pilots in an HE-LTF in 802.11ax are sent according to a single flow (similar to 802.11ac).

[0045] In a specific example, during uplink MU-MIMO transmission, an HE-LTF sequence of each STA is multiplied by an identification code allocated by the AP, in frequency, and the AP may estimate a CFO of each STA depending on a frequency identification code of each STA. Therefore, there is no special pilot subcarrier in an HE-LTF sequence of uplink MU-MIMO, and the HE-LTF sequence of uplink MU-MIMO is different from an HE-LTF sequence of downlink MU-MIMO.

[0046] In some less preferred embodiments, some HE-LTFs or some methods for generating an HE-LTF are provided; however, the impact of a pilot is not considered, and in the corresponding methods, a PAPR is relatively high.

[0047] For example, in a less preferred embodiment, a Barker sequence, that is, x, whose length is 13, is provided. A sequence whose length is 121 is generated according to the Barker sequence, and is represented by using M_1 . In addition, Barker sequences whose lengths are respectively 13 and 7 are found, and are respectively represented by using M_2 and M_3 . Specific sequences are represented as follows:

$x = [+1 +1 +1 -1 -1 -1 +1 -1 -1 +1 -1];$ % Barker 11 tones

$M_1 = [-x, x, -x, -x, x, -x, -x, -x, x, x, x];$ % 121 tones

$M_2 = [+1 +1 +1 +1 +1 -1 -1 +1 +1 -1 +1 -1 +1];$ % Barker 13 tones

$M_3 = [+1 +1 +1 -1 -1 +1 -1];$ % Barker 7 tones.

[0048] Next, sequences x, M_1 , M_2 , and M_3 are used to generate an HE-LTF sequence in the 2x/4x mode. The generated HE-LTF sequence is as follows:

[0085] 504: Perform concatenation from a small RU to a large RU within a transmission bandwidth, and select a PAPR sequence with an optimal PAPR of various RUs as an HE-LTF sequence corresponding to the bandwidth.

[0086] It should be noted that for different bandwidths, an HE-LTF sequence generated according to the foregoing method may be respectively stored at an AP end and a STA end in a wireless local area network, so that the HE-LTF sequence is directly used in the uplink and downlink transmission processes mentioned above.

[0087] Some more specific embodiments are described below. In the foregoing embodiments, it is mentioned that in different OFDMA subcarrier mapping manners, a transmitter (an AP or a STA) sends different HE-LTF sequences according to different bandwidths, different RU locations, and different RU sizes. The manner includes the following steps:

[0088] 601: Select one HE-LTF sequence according to a bandwidth, where the one HE-LTF sequence has two forms that respectively correspond to a 2x mode and a 4x mode in 802.11ax.

[0089] Preferably, the HE-LTF in the 2x mode includes: a sub-sequence Ga, a sub-sequence Gb, and +1 or -1 that is located at a leftover subcarrier location. Ga and Gb are sequences that are formed by +1 or -1 and that have a length of 13. In a specific example, Ga and Gb are respectively:

$$G_a = \{+1, +1, +1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1\}$$

$$G_b = \{+1, +1, +1, -1, -1, -1, -1, +1, -1, -1, -1, +1, -1\}.$$

[0090] The HE-LTF in the 2x mode may further include a sequence that is generated according to Ga and Gb. Herein, the sequence generated according to Ga and Gb is referred to as a derived sequence, which specifically includes, but is not limited to:

a sequence that is obtained after a phase of a value at a pilot location of the Ga sequence is reversed, where the sequence may be represented by G_a^p ;

a sequence that is obtained after a phase of a value at a pilot location of the Gb sequence is reversed, where the sequence may be represented by G_b^p ;

a sequence that is obtained after a phase of a value on an even-numbered subcarrier of the Ga sequence is reversed, where the sequence may be represented by G_c ; and

a sequence that is obtained after a phase of a value on an even-numbered subcarrier of the Gb sequence is reversed, where the sequence may be represented by G_d .

[0091] In addition, the derived sequence further includes: a sequence that is obtained after a phase of a value at a pilot location of a G_c sequence is reversed, where the sequence may be

may be implemented in a form of a software functional unit.

[0274] With descriptions of the foregoing embodiments, a person skilled in the art may clearly understand that the present invention may be implemented by hardware, firmware or a combination thereof. When the present invention is implemented by software, the foregoing functions may be stored in a computer-readable medium or transmitted as one or more instructions or code in the computer-readable medium. The computer-readable medium includes a computer storage medium and a communications medium, where the communications medium includes any medium that enables a computer program to be transmitted from one place to another. The storage medium may be any available medium accessible to a computer. The following provides an example but does not impose a limitation: The computer-readable medium may include a RAM, a ROM, an EEPROM, a CD-ROM, or another optical disc storage or disk storage medium, or another magnetic storage device, or any other medium that can carry or store expected program code in a form of an instruction or a data structure and can be accessed by a computer. In addition, any connection may be appropriately defined as a computer-readable medium. For example, if software is transmitted from a website, a server or another remote source by using a coaxial cable, an optical fiber/cable, a twisted pair, a digital STA line (DSL) or wireless technologies such as infrared ray, radio and microwave, the coaxial cable, optical fiber/cable, twisted pair, DSL or wireless technologies such as infrared ray, radio and microwave are included in a definition of a medium to which they belong. For example, a disk (Disk) and disc (disc) used by the present invention includes a compact disc CD, a laser disc, an optical disc, a digital versatile disc (DVD), a floppy disk and a Blu-ray disc, where the disk generally copies data by a magnetic means, and the disc copies data optically by a laser means. The foregoing combination should also be included in the protection scope of the computer-readable medium.

[0275] In summary, what is described above is merely examples of embodiments of the technical solutions of the present invention, but is not intended to limit the protection scope of the present invention. Any modification, equivalent replacement, or improvement made without departing from the principle of the present invention shall fall within the protection scope of the present invention.

What is claimed is:

1. A method for sending a long training sequence in a data packet in a wireless local area network, wherein the data packet complies with the 802.11ax standard, and the method comprises:

5 obtaining, by an access point (AP) according to a transmission bandwidth, an HE-LTF sequence corresponding to the transmission bandwidth (101); and

according to a size and a location of a resource block (RU) allocated to a station, mapping, a sequence segment, which is in the HE-LTF sequence and which location corresponds to the location of the allocated RU, to subcarriers in the allocated RU, and sending the sequence segment (102);

10 wherein an 2x HE-LTF sequence in an 80 MHz bandwidth transmission is:

$$\text{HE-LTF}_{2x}(-500:2:500) = [+1, +1, -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1,$$

$-1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1, -1, +1, +1, +1,$

 $+1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, -1, +1, +1,$
$$-1, -1, -1, +1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,$$
$$-1, -1, -1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, -1, +1,$$
$$+1, +1, -1, -1, -1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,$$
$$+1, -1, -1, -1, +1, +1, +1, -1, -1, +1, +1, +1, -1, +1, +1,$$
$$-1, +1, -1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1,$$
 $+1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1,$
$$+1, +1, -1, -1, +1, +1, +1, -1, +1, +1, -1, +1, -1, -1, +1,$$
$$-1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, -1, -1,$$
$$+1, +1, -1, +1, +1, +1, -1, -1, -1, -1, +1, +1, +1, -1, -1,$$
$$-1, -1, +1, -1, -1, -1, +1, -1, +1, +1, +1, -1, -1, +1, +1,$$
$$+1, -1, +1, +1, -1, +1, -1, -1, -1, -1, +1, -1, -1, -1, +1,$$
$$-1, +1, +1, -1, +1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1,$$
$$+1, +1, +1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, -1, +1$$
$$+1, +1, +1, -1, -1, -1, +1, +1, +1, 0, 0, 0, +1, -1, -1,$$
$$+1, +1, -1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1,$$
$$-1 \quad +1 \quad -1 \quad -1 \quad -1 \quad -1 \quad +1 \quad +1 \quad +1 \quad -1 \quad +1 \quad +1 \quad -1 \quad -1 \quad +1$$
$$-1, -1, +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, +1$$
$$-1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, +1, -1$$
$$+1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1$$

-1, -1, -1, +1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1,
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 10 -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, -1, +1, +1,
 +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, +1, +1, -1,
 +1, +1, +1, -1, +1, +1],

wherein the Equation means that, values on subcarriers with even indexes in indexes -500~500,
 are sequentially values in the HE-LTF sequence, and the values on subcarriers with other locations
 15 are 0.

2. A method for receiving a data packet in a wireless local area network, comprising:
 receiving a data packet that complies with the 802.11ax standard, and obtaining a total
 transmission bandwidth indicated in the data packet (201);
 obtaining, according to the total transmission bandwidth, an HE-LTF sequence corresponding to
 20 the total transmission bandwidth (202); and
 determining, by a station, according to a size and a location of a resource block (RU) allocated
 to the station, in the data packet, a corresponding HE-LTF sequence segment as a reference sequence
 that corresponds to the RU for channel estimation (203);

wherein an 2x HE-LTF sequence in an 80 MHz bandwidth transmission is:
 25 HE-LTF_{2x} (-500:2:500) = [+1, +1, -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1,
 -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1, -1, +1, +1, +1,
 +1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, -1, +1, +1,
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 15 -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, -1, +1, +1, +1,
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 -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1,
 +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, -1, +1,
 -1, -1, -1, -1, +1, +1, +1, -1, +1, +1, -1, -1, +1, -1, -1,
 20 -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1,
 -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, -1, +1, +1,
 +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, +1, +1, -1,
 +1, +1, +1, -1, +1, +1],

25 wherein the Equation means that values on subcarriers with even indexes in indexes -500~500
 are sequentially values in the HE-LTF sequence, and values on subcarriers with other locations are 0.

3. A method for sending a long training sequence in a data packet in a wireless local area network,
 wherein the data packet complies with the 802.11ax standard, and the method comprises:

30 obtaining, by a station, (STA), according to a size of an indicated transmission bandwidth, an
 HE-LTF sequence corresponding to the transmission bandwidth (301); and

mapping, by the station (STA), according to a size and a location of an allocated resource block
 (RU), a sequence segment, which is in the HE-LTF sequence and which location corresponds to the
 location of the allocated RU, to subcarriers in the allocated RU, and sending the sequence segment
 (302);

wherein an 2x HE-LTF sequence in an 80 MHz bandwidth transmission is:

HE-LTF_{2x} (-500:2:500) = [+1, +1, -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, +1, +1,
-1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1, -1, +1, +1, +1,
+1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, -1, +1, +1,
5 -1, -1, -1, +1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
-1, -1, -1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, -1, +1,
+1, +1, -1, -1, -1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,
+1, -1, -1, -1, +1, +1, +1, -1, -1, +1, +1, +1, -1, +1, +1,
-1, +1, -1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1,
10 +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1,
+1, +1, -1, -1, +1, +1, +1, -1, +1, +1, -1, +1, -1, -1, +1,
-1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, -1, -1,
+1, +1, -1, +1, +1, +1, -1, -1, -1, -1, +1, +1, +1, -1, -1,
-1, -1, +1, -1, -1, -1, +1, -1, +1, +1, +1, -1, -1, +1, +1,
15 +1, -1, +1, +1, -1, +1, -1, -1, -1, -1, +1, -1, -1, -1, +1,
-1, +1, +1, -1, +1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1,
+1, +1, +1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, -1, +1,
+1, +1, +1, -1, -1, -1, +1, +1, +1, 0, 0, 0, +1, -1, -1,
+1, +1, -1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1,
20 -1, +1, -1, -1, -1, -1, +1, +1, +1, -1, +1, +1, -1, -1, +1,
-1, -1, +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, +1,
-1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, +1, -1,
+1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1,
-1, -1, -1, +1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1,
25 -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, -1, -1, +1, -1,
-1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, -1, +1, +1, +1,
-1, +1, +1, +1, -1, +1, -1, +1, +1, -1, +1, -1, -1, -1, +1,
-1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1,
+1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, -1, +1,
30 -1, -1, -1, -1, +1, +1, +1, -1, +1, +1, -1, -1, +1, -1, -1,
-1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
-1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1,
-1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, -1, +1, +1,
+1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, +1, -1,

-1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, -1, -1, +1, -1,
 -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, -1, +1, +1, +1,
 -1, +1, +1, +1, -1, +1, -1, +1, +1, -1, +1, -1, -1, -1, +1,
 -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1,
 5 +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, -1, +1,
 -1, -1, -1, -1, +1, +1, +1, -1, +1, +1, -1, -1, +1, -1, -1,
 -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1,
 -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, -1, +1, +1,
 10 +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, +1, +1, -1,
 +1, +1, +1, -1, +1, +1],

wherein the Equation means that values on subcarriers with even indexes in indexes -500~500, are sequentially values in the HE-LTF sequence, and values on subcarriers with other locations are 0.

5. A method for sending a long training sequence in a data packet in a wireless local area network, the data packet complying with the 802.11ax standard, comprising:

obtaining, by an access point (AP) according to a total transmission bandwidth, an HE-LTF sequence corresponding to the total transmission bandwidth (101); and

mapping, by the AP, according to a size and a location of a resource block (RU) allocated to a station, a sequence segment, which is in the HE-LTF sequence and which location corresponds to the location of the allocated RU, to subcarriers in the allocated RU, and sending the sequence segment (102);

wherein an 4x HE-LTF sequence in an 80 MHz bandwidth transmission is:

$$\text{HE-LTF}_{4x}(-500:500) = [+1, +1, -1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, +1, +1,$$
 -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, -1, +1, -1,
 25 +1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1,
 -1, +1, +1, +1, -1, -1, -1, -1, -1, -1, +1, +1, +1, +1, +1,
 +1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1,
 -1, +1, +1, -1, +1, -1, +1, +1, +1, +1, -1, -1, +1, +1,
 +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
 30 +1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, -1,
 +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1, +1,
 -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1, -1, +1,
 -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, +1, -1,
 +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, +1,

-1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, +1, +1, +1, +1,
 -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1, -1,
 +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1,
 -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 5 -1, -1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,
 -1, -1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1,
 -1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1,
 +1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, -1, -1, -1,
 -1, -1, -1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
 10 -1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, +1, +1,
 -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1,
 -1, +1, -1, +1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1,
 +1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1,
 15 -1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1,
 +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1,
 +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, +1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1,
 -1, -1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1,
 20 +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1,
 -1, +1, -1, -1, -1, +1, -1, +1, -1, -1, -1, -1, +1, +1, +1,
 -1, -1, +1, 0, 0, 0, 0, 0, +1, -1, -1, -1, -1, -1, -1,
 +1, -1, +1, +1, -1, -1, +1, +1, -1, +1, -1, +1, +1, -1, -1,
 +1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, +1, +1,
 25 +1, +1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, +1, -1, +1,
 +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1,
 +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1, +1, -1,
 -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1,
 -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1,
 30 -1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, -1, -1,
 +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1, +1, +1, -1,
 +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1, -1, -1,
 -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1, -1, -1,

-1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1, -1,
 +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, -1,
 +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1,
 5 +1, +1, -1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1,
 -1, -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
 +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1,
 +1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 10 -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1,
 +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, -1,
 -1, -1, +1, -1, -1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
 -1, -1, +1, -1, -1, +1, -1, +1, -1, +1, -1, +1, -1, +1,
 15 +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1,
 -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, -1, +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1,
 -1, -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1,
 20 -1, -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1,
 +1, -1, +1, +1, -1, -1, +1, -1, +1, -1, +1], wherein the Equation means that values on
 subcarriers with indexes -500~500 are sequentially values in the HE-LTF sequence.

6. A method for receiving a data packet in a wireless local area network, comprising:
 25 receiving a data packet that complies with the 802.11ax standard, and obtaining a total
 transmission bandwidth indicated in the data packet (201);
 obtaining, according to the total transmission bandwidth, an HE-LTF sequence corresponding
 to the total transmission bandwidth (202); and
 determining, by a scheduled station (STA) according to a size and a location of a resource block
 30 (RU) allocated to the station, in the data packet, a corresponding HE-LTF sequence segment, as a
 reference sequence of the RU for channel estimation (203);
 wherein an 4x HE-LTF sequence in an 80 MHz bandwidth transmission is:

$$\text{HE-LTF}_{4x}(-500:500) = [+1, +1, -1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, +1, +1,$$

$$-1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, -1, +1, -1,$$

+1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1,
 -1, +1, +1, +1, -1, -1, -1, -1, -1, -1, +1, +1, +1, +1, +1,
 +1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1,
 -1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1,
 5 +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
 +1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1, -1,
 +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1, +1,
 -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1, -1, +1,
 -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, +1, -1,
 10 +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, +1,
 -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, +1, +1, +1, +1,
 -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1, -1,
 +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1,
 -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 15 -1, -1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,
 -1, -1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1,
 -1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1,
 +1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, -1, -1, -1,
 -1, -1, -1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
 20 -1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, +1, +1,
 -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1,
 -1, +1, -1, +1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1,
 +1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1,
 25 -1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1,
 +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1,
 +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, +1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1,
 -1, -1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1,
 30 +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1,
 -1, +1, -1, -1, -1, +1, -1, +1, -1, -1, -1, -1, +1, +1, +1,
 -1, -1, +1, 0, 0, 0, 0, 0, +1, -1, -1, -1, -1, -1, -1,
 +1, -1, +1, +1, -1, -1, +1, +1, -1, +1, -1, +1, +1, -1, -1,
 +1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, +1, +1,

+1, +1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, +1, -1, +1,
 +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1,
 +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1, +1, -1,
 -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1,
 5 -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1,
 -1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, -1, -1,
 +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1, +1, +1, -1,
 +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1, -1, -1,
 10 -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1, -1, -1,
 -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1, -1,
 +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, -1,
 +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1,
 15 +1, +1, -1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1,
 -1, -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
 +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1,
 +1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 20 -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1,
 +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, -1,
 -1, -1, +1, -1, -1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
 -1, -1, +1, -1, -1, +1, -1, +1, -1, +1, -1, +1, -1, -1, +1,
 25 +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1,
 -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, -1, +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1, +1,
 -1, -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1,
 30 -1, -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1,
 +1, -1, +1, +1, -1, -1, +1, -1, +1, -1, +1],

wherein the Equation means that values on subcarriers with indexes -500~500 are sequentially values in the HE-LTF sequence.

7. A method for sending a long training sequence in a data packet in a wireless local area network, wherein the data packet complies with the 802.11ax standard, and the method comprises:

obtaining, by a station (STA) according to a size of an indicated total transmission bandwidth, an HE-LTF sequence corresponding to the total transmission bandwidth (301); and

5 mapping, by the station (STA), according to a size and a location of an allocated resource block (RU), a sequence segment, which is in the HE-LTF sequence and which location corresponds to the location of the allocated RU, to subcarriers in the allocated RU, and sending the sequence segment (302);

wherein an 4x HE-LTF sequence in an 80 MHz bandwidth transmission is:

10 HE-LTF_{4x}(-500:500) = [+1, +1, -1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, +1, +1,
-1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, -1, +1, -1,
+1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1,
-1, +1, +1, +1, -1, -1, -1, -1, -1, -1, +1, +1, +1, +1, +1,
+1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1,
15 -1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1,
+1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
+1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1, -1,
+1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1, +1,
-1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1, -1, +1,
20 -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, +1, -1,
+1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, +1,
-1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, +1, +1, +1, +1,
-1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1, -1,
+1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1,
25 -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
-1, -1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,
-1, -1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1,
-1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1,
+1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, -1, -1, -1,
30 -1, -1, -1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
-1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, +1, +1,
-1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1,
-1, +1, -1, +1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
+1, -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1,

+1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1,
 -1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1,
 +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1,
 +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 5 +1, +1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1,
 -1, -1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1,
 +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1,
 -1, +1, -1, -1, -1, +1, -1, +1, -1, -1, -1, -1, +1, +1, +1,
 -1, -1, +1, 0, 0, 0, 0, 0, +1, -1, -1, -1, -1, -1, -1,
 10 +1, -1, +1, +1, -1, -1, +1, +1, -1, +1, -1, +1, +1, -1, -1,
 +1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, +1, +1,
 +1, +1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, +1, -1, +1,
 +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1,
 +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1, +1, -1,
 15 -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1,
 -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1,
 -1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, -1, -1,
 +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1, +1, +1, -1,
 20 +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1, -1, -1,
 -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1, -1, -1,
 -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1, -1,
 +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, -1,
 +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1,
 25 -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1,
 +1, +1, -1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1,
 -1, -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
 +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1,
 30 +1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1,
 -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1,
 +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, -1,
 -1, -1, +1, -1, -1, +1, +1, -1, +1, -1, +1, -1, -1, -1,
 -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, -1, +1,

-1, -1, +1, -1, -1, +1, -1, +1, -1, +1, -1, +1, -1, -1, +1,
+1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1,
-1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
-1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
5 +1, -1, +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1, +1,
-1, -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1,
-1, -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1,
+1, -1, +1, +1, -1, -1, +1, -1, +1, -1, +1],

wherein the Equation means that values on subcarriers with indexes -500~500 are sequentially
10 values in the HE-LTF sequence.

8. A method for receiving a data packet in a wireless local area network, wherein:

receiving, by an access point (AP), a data packet that complies with the 802.11ax standard, and
obtaining, according to a total transmission bandwidth, an HE-LTF sequence corresponding to the
total transmission bandwidth (401); and

15 determining, by the AP, from the HE-LTF sequence, according to a size and a location of a
resource block (RU) allocated to each uplink station, a corresponding HE-LTF sequence segment, as
a reference sequence of the RU for channel estimation (402);

wherein an 4x HE-LTF sequence in an 80 MHz bandwidth transmission is:

HE-LTF_{4x} (-500:500) = [+1, +1, -1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, +1, +1,
20 -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, -1, +1, -1,
+1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1,
-1, +1, +1, +1, -1, -1, -1, -1, -1, -1, +1, +1, +1, +1, +1,
+1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1,
-1, +1, +1, -1, +1, -1, +1, +1, +1, +1, -1, -1, +1, +1,
25 +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
+1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1, -1,
+1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1, +1,
-1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1, -1, +1,
-1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, +1, -1,
30 +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, +1,
-1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, +1, +1, +1, +1,
-1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1, -1,
+1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1,
-1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,

-1, -1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,
 -1, -1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1,
 -1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1,
 +1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, -1, -1, -1,
 5 -1, -1, -1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
 -1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, +1, +1,
 -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1,
 -1, +1, -1, +1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1,
 10 +1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1,
 -1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1,
 +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1,
 +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, +1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1,
 15 -1, -1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1,
 +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1,
 -1, +1, -1, -1, -1, +1, -1, +1, -1, -1, -1, -1, +1, +1, +1,
 -1, -1, +1, 0, 0, 0, 0, 0, +1, -1, -1, -1, -1, -1, -1,
 +1, -1, +1, +1, -1, -1, +1, +1, -1, +1, -1, +1, +1, -1, -1,
 20 +1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, +1, +1,
 +1, +1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, +1, -1, +1,
 +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1,
 +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1, +1, -1,
 -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1,
 25 -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1,
 -1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, -1, -1,
 +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1, +1, +1, -1,
 +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1, -1, -1,
 30 -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1, -1, -1,
 -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1, -1,
 +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, -1,
 +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1,

+1, +1, -1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1,
 -1, -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
 +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1,
 5 +1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1,
 -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1,
 +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, -1,
 -1, -1, +1, -1, -1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
 10 -1, -1, +1, -1, -1, +1, -1, +1, -1, +1, -1, +1, -1, -1, +1,
 +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1,
 -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, -1, +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1, +1,
 15 -1, -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1,
 -1, -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1,
 +1, -1, +1, +1, -1, -1, +1, -1, +1, -1, +1,

wherein the Equation means that values on subcarriers with indexes -500~500 are sequentially values in the HE-LTF sequence.

9. The method according to any one of claims 1 to 8, wherein:

20 the HE-LTF sequence is a stored sequence or a sequence obtained by generating.

10. An apparatus applied in a wireless local area network, located on a side of an access point complying with 802.11ax, and comprising:

a unit configured to obtain, according to a total transmission bandwidth, an HE-LTF sequence corresponding to the total transmission bandwidth (101); and

25 a unit configured to: map, according to a size and a location of a resource block (RU) allocated to a station, a sequence segment that corresponds to the location of the RU and that is in the HE-LTF sequence to subcarriers in the allocated RU, and send the sequence segment (102);

wherein an 2x HE-LTF sequence in an 80 MHz bandwidth transmission is:

HE-LTF_{2x} (-500:2:500) = [+1, +1, -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1,
 30 -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1, -1, +1, +1, +1,
 +1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, -1, +1, +1,
 -1, -1, -1, +1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 -1, -1, -1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, -1, +1,
 +1, +1, -1, -1, -1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,

+1, -1, -1, -1, +1, +1, +1, -1, -1, +1, +1, +1, -1, +1, +1,
 -1, +1, -1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1,
 +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1,
 +1, +1, -1, -1, +1, +1, +1, -1, +1, +1, -1, +1, -1, -1, +1,
 5 -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, -1, -1,
 +1, +1, -1, +1, +1, +1, -1, -1, -1, -1, +1, +1, +1, -1, -1,
 -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, +1, -1, -1, +1, +1,
 +1, -1, +1, +1, -1, +1, -1, -1, -1, -1, +1, -1, -1, -1, +1,
 -1, +1, +1, -1, +1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1,
 10 +1, +1, +1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, -1, +1,
 +1, +1, +1, -1, -1, -1, +1, +1, +1, 0, 0, 0, +1, -1, -1,
 +1, +1, -1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1,
 -1, +1, -1, -1, -1, -1, +1, +1, +1, -1, +1, +1, -1, -1, +1,
 -1, -1, +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, +1,
 15 -1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, +1, -1,
 +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1,
 -1, -1, -1, +1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1,
 -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, -1, -1, +1, -1,
 -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, -1, +1, +1, +1,
 20 -1, +1, +1, +1, -1, +1, -1, +1, +1, -1, +1, -1, -1, -1, +1,
 -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1,
 +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, -1, +1,
 -1, -1, -1, -1, +1, +1, +1, -1, +1, +1, -1, -1, +1, -1, -1,
 -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 25 -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1,
 -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, -1, +1, +1,
 +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, +1, +1, -1,
 +1, +1, +1, -1, +1, +1],

wherein the Equation means that values on subcarriers with even indexes in indexes -500~500
 30 are sequentially values in the HE-LTF sequence, and values on subcarriers with other locations are 0.

11. An apparatus applied in a wireless local area network, located on a side of a station
 complying with 802.11ax, and comprising:

a unit configured to: receive a data packet that complies with the 802.11ax standard, and obtain

a total transmission bandwidth indicated in the data packet (201);

a unit configured to obtain, according to the total transmission bandwidth, an HE-LTF sequence corresponding to the total transmission bandwidth (202); and

5 a unit configured to determine, according to a size and a location of a resource block (RU) allocated to the station in the data packet, a corresponding HE-LTF sequence segment, as a reference sequence that corresponds to the RU for channel estimation (203);

wherein an 2x HE-LTF sequence in an 80 MHz bandwidth transmission is:

HE-LTF_{2x} (-500:2:500) = [+1, +1, -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, +1, +1,
10 -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1, -1, +1, +1, +1,
+1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, -1, +1, +1,
-1, -1, -1, +1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
-1, -1, -1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, -1, +1,
+1, +1, -1, -1, -1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,
+1, -1, -1, -1, +1, +1, +1, -1, -1, +1, +1, +1, -1, +1, +1,
15 -1, +1, -1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1,
+1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1,
+1, +1, -1, -1, +1, +1, +1, -1, +1, +1, -1, +1, -1, -1, +1,
-1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, -1, -1,
+1, +1, -1, +1, +1, +1, -1, -1, -1, -1, +1, +1, +1, -1, -1,
20 -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, +1, -1, -1, +1, +1,
+1, -1, +1, +1, -1, +1, -1, -1, -1, -1, +1, -1, -1, -1, +1,
-1, +1, +1, -1, +1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1,
+1, +1, +1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, -1, +1,
+1, +1, +1, -1, -1, -1, +1, +1, +1, 0, 0, 0, +1, -1, -1,
25 +1, +1, -1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1,
-1, +1, -1, -1, -1, -1, +1, +1, +1, -1, +1, +1, -1, -1, +1,
-1, -1, +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, +1,
-1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, +1, -1,
+1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1,
30 -1, -1, -1, +1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1,
-1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, -1, -1, +1, -1,
-1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, -1, +1, +1, +1,
-1, +1, +1, +1, -1, +1, -1, +1, +1, -1, +1, -1, -1, -1, +1,
-1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, -1, +1,

+1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, -1, +1,
-1, -1, -1, -1, +1, +1, +1, -1, +1, +1, -1, -1, +1, -1, -1,
-1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
-1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1,
5 -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, -1, +1, +1,
+1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, +1, +1, -1,
+1, +1, +1, -1, +1, +1],

wherein the Equation means that values on subcarriers with even indexes in indexes -500~500,
are sequentially values in the HE-LTF sequence, and values on subcarriers with other locations are 0.

12. An apparatus applied in a wireless local area network, located on a side of a station
complying with 802.11ax, and comprising:

a unit configured to obtain, according to a size of an indicated total transmission bandwidth, an
HE-LTF sequence corresponding to the total transmission bandwidth (301); and

a unit configured to: map, according to a size and a location of an allocated resource block (RU),
15 a sequence segment, which is in the HE-LTF sequence and which location corresponds to the location
of the allocated RU, to subcarriers in the allocated RU, and send the sequence segment (302);

wherein an 2x HE-LTF sequence in an 80 MHz bandwidth transmission is:

HE-LTF_{2x} (-500:2:500) = [+1, +1, -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1,
-1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1, -1, +1, +1, +1,
20 +1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, -1, +1, +1,
-1, -1, -1, +1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
-1, -1, -1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, -1, +1,
+1, +1, -1, -1, -1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,
+1, -1, -1, -1, +1, +1, +1, -1, -1, +1, +1, +1, -1, +1, +1,
25 -1, +1, -1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1,
+1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1,
+1, +1, -1, -1, +1, +1, +1, -1, +1, +1, -1, +1, -1, -1, +1,
-1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, -1, -1,
+1, +1, -1, +1, +1, +1, -1, -1, -1, -1, +1, +1, +1, -1, -1,
30 -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, +1, -1, -1, +1, +1,
+1, -1, +1, +1, -1, +1, -1, -1, -1, -1, +1, -1, -1, -1, +1,
-1, +1, +1, -1, +1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1,
+1, +1, +1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, -1, +1,
+1, +1, +1, -1, -1, -1, +1, +1, +1, 0, 0, 0, +1, -1, -1,

+1, +1, -1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1,
 -1, +1, -1, -1, -1, -1, +1, +1, +1, -1, +1, +1, -1, -1, +1,
 -1, -1, +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, +1,
 -1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, +1, -1,
 5 +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1,
 -1, -1, -1, +1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1,
 -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, -1, -1, +1, -1,
 -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, -1, +1, +1, +1,
 -1, +1, +1, +1, -1, +1, -1, +1, +1, -1, +1, -1, -1, -1, +1,
 10 -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1,
 +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, -1, +1,
 -1, -1, -1, -1, +1, +1, +1, -1, +1, +1, -1, -1, +1, -1, -1,
 -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1,
 15 -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, -1, +1, +1,
 +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, +1, +1, -1,
 +1, +1, +1, -1, +1, +1],

wherein the Equation means that values on subcarriers with even indexes in indexes -500~500,
 are sequentially values in the HE-LTF sequence, and the values on subcarriers with other locations
 20 are 0.

13. An apparatus applied in a wireless local area network, located on a side of an access point
 complying with 802.11ax, and comprising:

a unit configured to: receive a data packet that complies with the 802.11ax standard, and obtain,
 according to a total transmission bandwidth, an HE-LTF sequence corresponding to the total
 25 transmission bandwidth (401); and

a unit configured to determine, from the HE-LTF sequence, according to a size and a location of
 a resource block (RU) allocated to each uplink station, a corresponding HE-LTF sequence segment,
 as a reference sequence of the RU for channel estimation (402);

wherein an 2x HE-LTF sequence in an 80 MHz bandwidth transmission is:

30 HE-LTF_{2x} (-500:2:500) = [+1, +1, -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1,
 -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1, -1, +1, +1, +1,
 +1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, -1, +1, +1,
 -1, -1, -1, +1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 -1, -1, -1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, -1, +1,

+1, +1, -1, -1, -1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,
 +1, -1, -1, -1, +1, +1, +1, -1, -1, +1, +1, +1, -1, +1, +1,
 -1, +1, -1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1,
 +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1,
 5 +1, +1, -1, -1, +1, +1, +1, -1, +1, +1, -1, +1, -1, -1, +1,
 -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, -1, -1,
 +1, +1, -1, +1, +1, +1, -1, -1, -1, -1, +1, +1, +1, -1, -1,
 -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, +1, -1, -1, +1, +1,
 +1, -1, +1, +1, -1, +1, -1, -1, -1, -1, +1, -1, -1, -1, +1,
 10 -1, +1, +1, -1, +1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1,
 +1, +1, +1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, -1, +1,
 +1, +1, +1, -1, -1, -1, +1, +1, +1, 0, 0, 0, +1, -1, -1,
 +1, +1, -1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1,
 -1, +1, -1, -1, -1, -1, +1, +1, +1, -1, +1, +1, -1, -1, +1,
 15 -1, -1, +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, +1,
 -1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, +1, -1,
 +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1,
 -1, -1, -1, +1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1,
 -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, -1, -1, +1, -1,
 20 -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, -1, +1, +1, +1,
 -1, +1, +1, +1, -1, +1, -1, +1, +1, -1, +1, -1, -1, -1, +1,
 -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1,
 +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, -1, +1,
 -1, -1, -1, -1, +1, +1, +1, -1, +1, +1, -1, -1, +1, -1, -1,
 25 -1, -1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1,
 -1, +1, +1, +1, -1, +1, +1, +1, +1, -1, -1, -1, -1, +1, +1,
 +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, +1, -1,
 +1, +1, +1, -1, +1, +1], wherein the Equation means that values on subcarriers with even indexes
 30 in indexes -500~500, are sequentially values in the HE-LTF sequence, and values on subcarriers with
 other locations are 0.

14. An apparatus applied in a wireless local area network, located on a side of an access point complying with 802.11ax, and comprising:

a unit configured to obtain, according to a total transmission bandwidth, an HE-LTF sequence

corresponding to the total transmission bandwidth (101); and

a unit configured to: map, according to a size and a location of a resource block (RU) allocated to a station, a sequence segment, which is in the HE-LTF sequence and which location corresponds to the location of the allocated RU, to subcarriers in the allocated RU, and send the sequence segment

5 (102);

wherein an 4x HE-LTF sequence in an 80 MHz bandwidth transmission is:

HE-LTF_{4x} (-500:500) = [+1, +1, -1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, +1, +1,

-1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, -1, +1, -1,

+1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1,

10 -1, +1, +1, +1, -1, -1, -1, -1, -1, -1, +1, +1, +1, +1, +1,

+1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1,

-1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1,

+1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,

+1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1, -1,

15 +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1, +1,

-1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1, -1, +1,

-1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, +1, -1,

+1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, +1,

-1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, +1, +1, +1, +1,

20 -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1, -1,

+1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1,

-1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,

-1, -1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,

-1, -1, +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1,

25 -1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1,

+1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, -1, -1, -1,

-1, -1, -1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,

-1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, +1, +1,

-1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1,

30 -1, +1, -1, +1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,

+1, -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1,

+1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1,

-1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1,

+1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1,

+1, +1, -1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, +1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1,
 -1, -1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1,
 +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1,
 5 -1, +1, -1, -1, -1, +1, -1, +1, -1, -1, -1, -1, +1, +1, +1,
 -1, -1, +1, 0, 0, 0, 0, 0, +1, -1, -1, -1, -1, -1, -1,
 +1, -1, +1, +1, -1, -1, +1, +1, -1, +1, -1, +1, +1, -1, -1,
 +1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, +1, +1,
 +1, +1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, +1, -1, +1,
 10 +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1,
 +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1, +1, -1,
 -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1,
 -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1,
 -1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, -1, -1,
 15 +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1, +1, +1, -1,
 +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1, -1, -1,
 -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1, -1, -1,
 -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1, -1,
 20 +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, -1,
 +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1,
 +1, +1, -1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, +1,
 25 -1, -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
 +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1,
 +1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, +1,
 +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, -1,
 30 -1, -1, +1, -1, -1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
 -1, -1, +1, -1, -1, +1, -1, +1, -1, +1, -1, +1, -1, +1,
 +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1,
 -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,

-1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
+1, -1, +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1,
-1, -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1,
-1, -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1,
+1, -1, +1, +1, -1, -1, +1, -1, +1, -1, +1],

wherein the Equation means that values on subcarriers with indexes -500~500 are sequentially values in the HE-LTF sequence.

15. An apparatus applied in a wireless local area network, located on a side of a station complying with 802.11ax, and comprising:

a unit configured to: receive a data packet that complies with the 802.11ax standard, and obtain a total transmission bandwidth indicated in the data packet (201);

a unit configured to obtain, according to the total transmission bandwidth, an HE-LTF sequence corresponding to the total transmission bandwidth (202); and

a unit configured to determine, according to a size and a location of a resource block (RU) allocated to the station, in the data packet, a corresponding HE-LTF sequence segment, as a reference sequence of the RU for channel estimation (203);

wherein an 4x HE-LTF sequence in an 80 MHz bandwidth transmission is:

HE-LTF_{4x} (-500:500) = [+1, +1, -1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, +1, +1,
-1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, -1, +1, -1,
+1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1,
-1, +1, +1, +1, -1, -1, -1, -1, -1, -1, +1, +1, +1, +1, +1,
+1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1,
-1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1,
+1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
+1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1, -1,
+1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1, +1,
-1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1, -1, +1,
-1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, +1, -1,
+1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, +1,
-1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, +1, +1, +1, +1,
-1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1, -1,
+1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1,
-1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,

-1, -1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,
 -1, -1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1,
 -1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1,
 +1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, -1, -1, -1,
 5 -1, -1, -1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
 -1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, +1, +1,
 -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1,
 -1, +1, -1, +1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1,
 10 +1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1,
 -1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1,
 +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1,
 +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, +1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1,
 15 -1, -1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1,
 +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1,
 -1, +1, -1, -1, -1, +1, -1, +1, -1, -1, -1, -1, +1, +1, +1,
 -1, -1, +1, 0, 0, 0, 0, 0, +1, -1, -1, -1, -1, -1, -1,
 +1, -1, +1, +1, -1, -1, +1, +1, -1, +1, -1, +1, +1, -1, -1,
 20 +1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, +1, +1,
 +1, +1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, +1, -1, +1,
 +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1,
 +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1, +1, -1,
 -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1,
 25 -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1,
 -1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, -1, -1,
 +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1, +1, +1, -1,
 +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1, -1, -1,
 30 -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1, -1, -1,
 -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1, -1,
 +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, -1,
 +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1,

+1, +1, -1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1,
 -1, -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
 +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1,
 5 +1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1,
 -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1,
 +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, -1,
 -1, -1, +1, -1, -1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
 10 -1, -1, +1, -1, -1, +1, -1, +1, -1, +1, -1, +1, -1, -1, +1,
 +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1,
 -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, -1, +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1, +1,
 15 -1, -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1,
 -1, -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1,
 +1, -1, +1, +1, -1, -1, +1, -1, +1, -1, +1],

wherein the Equation means that values on subcarriers with indexes -500~500 are sequentially values in the HE-LTF sequence.

20 16. An apparatus applied in a wireless local area network, located on a side of a station complying with 802.11ax, and comprising:

a unit configured to obtain, according to a size of an indicated total transmission bandwidth, an HE-LTF sequence corresponding to the total transmission bandwidth (301); and

25 a unit configured to: map, according to a size and a location of an allocated resource block (RU), a sequence segment, which is in the HE-LTF sequence and which location corresponds to the location of the allocated RU, to subcarriers in the allocated RU, and send the sequence segment (302);

wherein an 4x HE-LTF sequence in an 80 MHz bandwidth transmission is:

30 HE-LTF_{4x} (-500:500) = [+1, +1, -1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, +1, +1,
 -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, -1, +1, -1,
 +1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1,
 -1, +1, +1, +1, -1, -1, -1, -1, -1, -1, +1, +1, +1, +1, +1,
 +1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1,
 -1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1,

+1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
 +1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1, -1,
 +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1, +1,
 -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1, -1, +1,
 5 -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, +1, -1,
 +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, +1,
 -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, +1, +1, +1, +1,
 -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1, -1,
 +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1,
 10 -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 -1, -1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,
 -1, -1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1,
 -1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1,
 +1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, -1, -1, -1,
 15 -1, -1, -1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
 -1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, +1, +1,
 -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1,
 -1, +1, -1, +1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1,
 20 +1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1,
 -1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1,
 +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1,
 +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, +1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1,
 25 -1, -1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1,
 +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1,
 -1, +1, -1, -1, -1, +1, -1, +1, -1, -1, -1, -1, +1, +1, +1,
 -1, -1, +1, 0, 0, 0, 0, 0, +1, -1, -1, -1, -1, -1, -1,
 +1, -1, +1, +1, -1, -1, +1, +1, -1, +1, -1, +1, +1, -1, -1,
 30 +1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, +1, +1,
 +1, +1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, +1, -1, +1,
 +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1,
 +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1, +1, -1,
 -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1,

-1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1,
 -1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, -1, -1,
 +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1, +1, +1, -1,
 5 +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1, -1, -1,
 -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1, -1, -1,
 -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1, -1,
 +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, -1,
 +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 10 -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1,
 +1, +1, -1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1,
 -1, -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
 +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1,
 15 +1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1,
 -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1,
 +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, -1,
 -1, -1, +1, -1, -1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
 20 -1, -1, +1, -1, -1, +1, -1, +1, -1, +1, -1, +1, -1, -1, +1,
 +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1,
 -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, -1, +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1, +1,
 25 -1, -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1,
 -1, -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1,
 +1, -1, +1, +1, -1, -1, +1, -1, +1, -1, +1],

wherein the Equation means that values on subcarriers with indexes -500~500 are sequentially values in the HE-LTF sequence.

17. An apparatus applied in a wireless local area network, located on a side of an access point complying with 802.11ax, and comprising:

a unit configured to: receive a data packet that complies with the 802.11ax standard, and obtain, according to a total transmission bandwidth, an HE-LTF sequence corresponding to the total transmission bandwidth (401); and

a unit configured to select, from the HE-LTF sequence, according to a size and a location of a resource block (RU) allocated to each uplink station, a corresponding HE-LTF sequence segment, as a reference sequence of the RU for channel estimation (402);

wherein an 4x HE-LTF sequence in an 80 MHz bandwidth transmission is:

5 HE-LTF_{4x}(-500:500) = [+1, +1, -1, +1, -1, +1, -1, -1, -1, +1, -1, -1, -1, +1, +1,
-1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, -1, +1, -1,
+1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1,
-1, +1, +1, +1, -1, -1, -1, -1, -1, -1, +1, +1, +1, +1, +1,
+1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1,
10 -1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1,
+1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
+1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1, -1,
+1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1, +1,
-1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1, -1, +1,
15 -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, +1, -1,
+1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, +1,
-1, -1, -1, +1, +1, +1, +1, -1, +1, +1, +1, +1, +1, +1, +1,
-1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, -1, -1,
+1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1,
20 -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
-1, -1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1,
-1, -1, +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1,
-1, +1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1,
+1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, -1, -1, -1,
25 -1, -1, -1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
-1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, +1, +1,
-1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1, +1, -1,
-1, +1, -1, +1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
+1, -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1,
30 +1, +1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, +1, +1, -1,
-1, +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1,
+1, -1, +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1,
+1, +1, -1, -1, -1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
+1, +1, -1, +1, +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1,

-1, -1, +1, +1, -1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1,
 +1, +1, -1, +1, +1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1,
 -1, +1, -1, -1, -1, +1, -1, +1, -1, -1, -1, -1, +1, +1, +1,
 -1, -1, +1, 0, 0, 0, 0, 0, +1, -1, -1, -1, -1, -1, -1,
 5 +1, -1, +1, +1, -1, -1, +1, +1, -1, +1, -1, +1, +1, -1, -1,
 +1, -1, +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, +1, +1,
 +1, +1, +1, +1, +1, -1, +1, -1, -1, +1, -1, -1, +1, -1, +1,
 +1, +1, -1, -1, +1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1,
 +1, -1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, -1, +1, -1,
 10 -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1,
 -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1,
 -1, +1, +1, -1, -1, +1, -1, +1, -1, -1, -1, -1, -1, -1, -1,
 +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, -1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1, +1, +1, -1,
 15 +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1, -1, -1,
 -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1, -1, -1,
 -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1, -1,
 +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1, -1, -1,
 +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 20 -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1,
 +1, +1, -1, -1, +1, -1, +1, -1, +1, +1, +1, -1, +1, -1, -1,
 +1, +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1,
 -1, -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1,
 +1, -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1,
 25 +1, +1, -1, +1, +1, +1, +1, +1, -1, -1, +1, +1, +1, +1, +1,
 -1, +1, +1, -1, -1, -1, +1, -1, -1, -1, +1, -1, +1, -1, +1,
 +1, +1, +1, +1, -1, -1, -1, +1, +1, +1, +1, -1, +1, +1, -1,
 -1, -1, +1, -1, -1, +1, +1, -1, +1, -1, +1, -1, -1, -1, -1,
 -1, -1, +1, +1, -1, -1, -1, +1, -1, -1, +1, +1, +1, -1, +1,
 30 -1, -1, +1, -1, -1, +1, -1, +1, -1, +1, -1, +1, -1, -1, +1,
 +1, -1, +1, -1, +1, +1, +1, -1, -1, +1, -1, -1, -1, +1, -1,
 -1, -1, -1, -1, -1, -1, +1, -1, +1, +1, -1, +1, +1, -1, +1,
 -1, -1, -1, +1, +1, -1, +1, +1, +1, -1, -1, +1, +1, +1, +1,
 +1, -1, +1, -1, -1, -1, -1, +1, +1, -1, -1, -1, -1, +1,

-1, -1, +1, +1, +1, -1, +1, +1, +1, -1, +1, -1, +1, -1, -1,
-1, -1, -1, +1, +1, +1, -1, -1, -1, -1, +1, -1, -1, +1, +1,
+1, -1, +1, +1, -1, -1, +1, -1, +1, -1, +1],

wherein the Equation means that values on subcarriers with indexes -500~500 are sequentially

5 values in the HE-LTF sequence.

18. The apparatus according to any one of claims 10 to 17, wherein:

the HE-LTF sequence is a stored sequence or a sequence obtained by generating.