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(54) BLIND SCAN METHOD, NON-TRANSITORY COMPUTER-READABLE MEDIUM AND CONTROL CIRCUIT THEREOF

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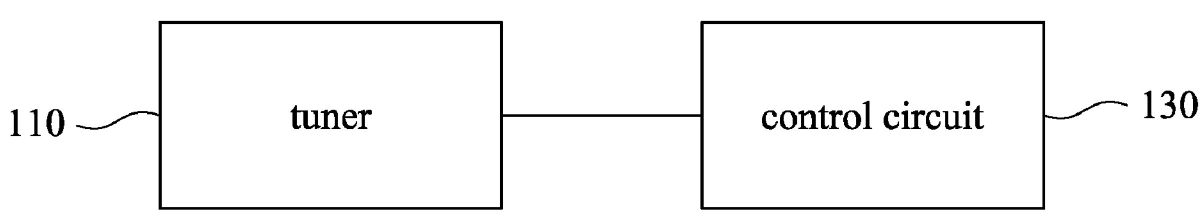
(57) **ABSTRACT**

A blind scan method includes setting a tuner to scan a first spectrum block with a first center frequency as a center and determining whether the first spectrum block comprises a possible signal; adjusting the tuner to scan a second spectrum block with a second center frequency as the center according to a first rise point and a first drop point when it is determined that the first spectrum block comprises the possible signal; and determining whether the second spectrum block comprises a valid signal.

100



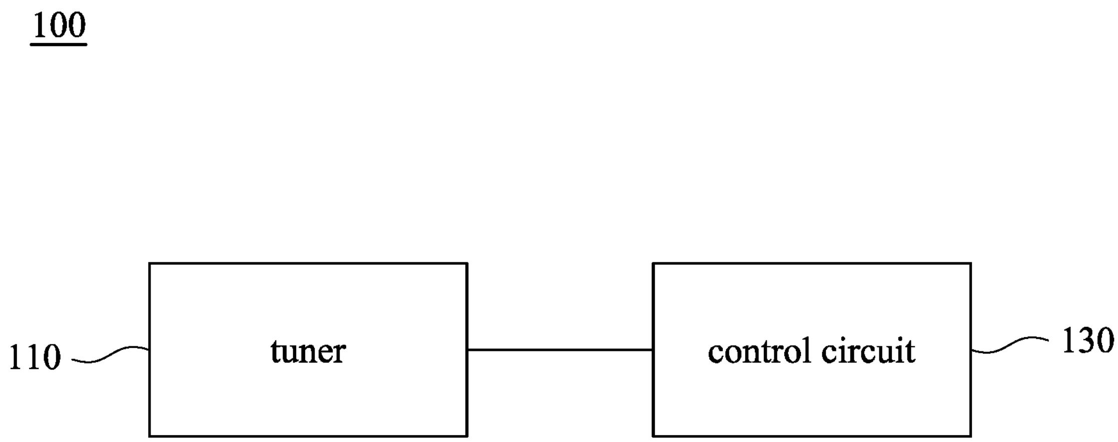


Fig. 1

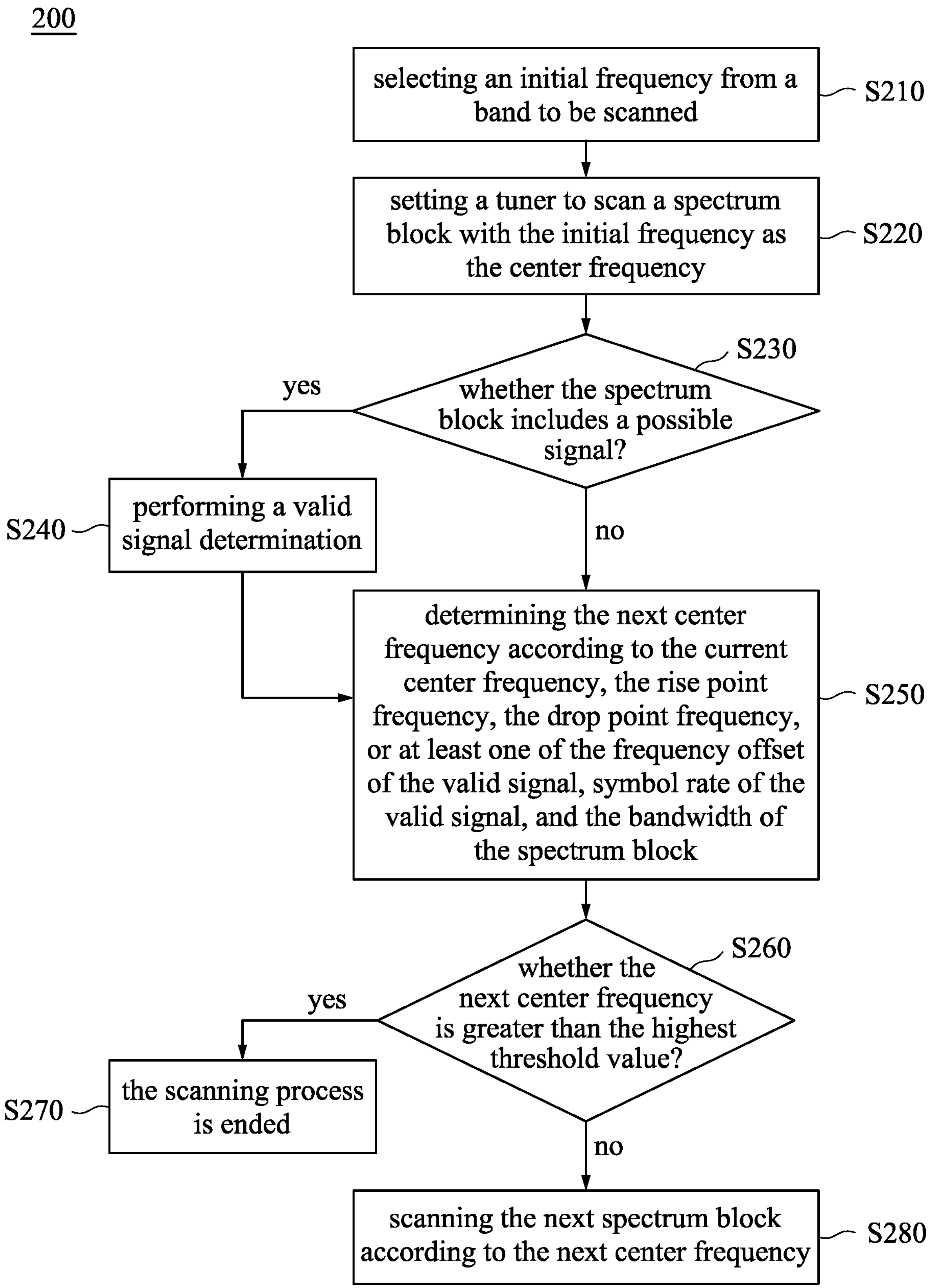

200
selecting an initial frequency from a band to be scanned
S210
setting a tuner to scan a spectrum block with the initial frequency as the center frequency
S220
whether the spectrum block includes a possible signal?
S230
yes
no
performing a valid signal determination
S240
determining the next center frequency according to the current center frequency, the rise point frequency, the drop point frequency, or at least one of the frequency offset of the valid signal, symbol rate of the valid signal, and the bandwidth of the spectrum block
S250
whether the next center frequency is greater than the highest threshold value?
S260
yes
no
the scanning process is ended
S270
scanning the next spectrum block according to the next center frequency
S280

Fig. 2A

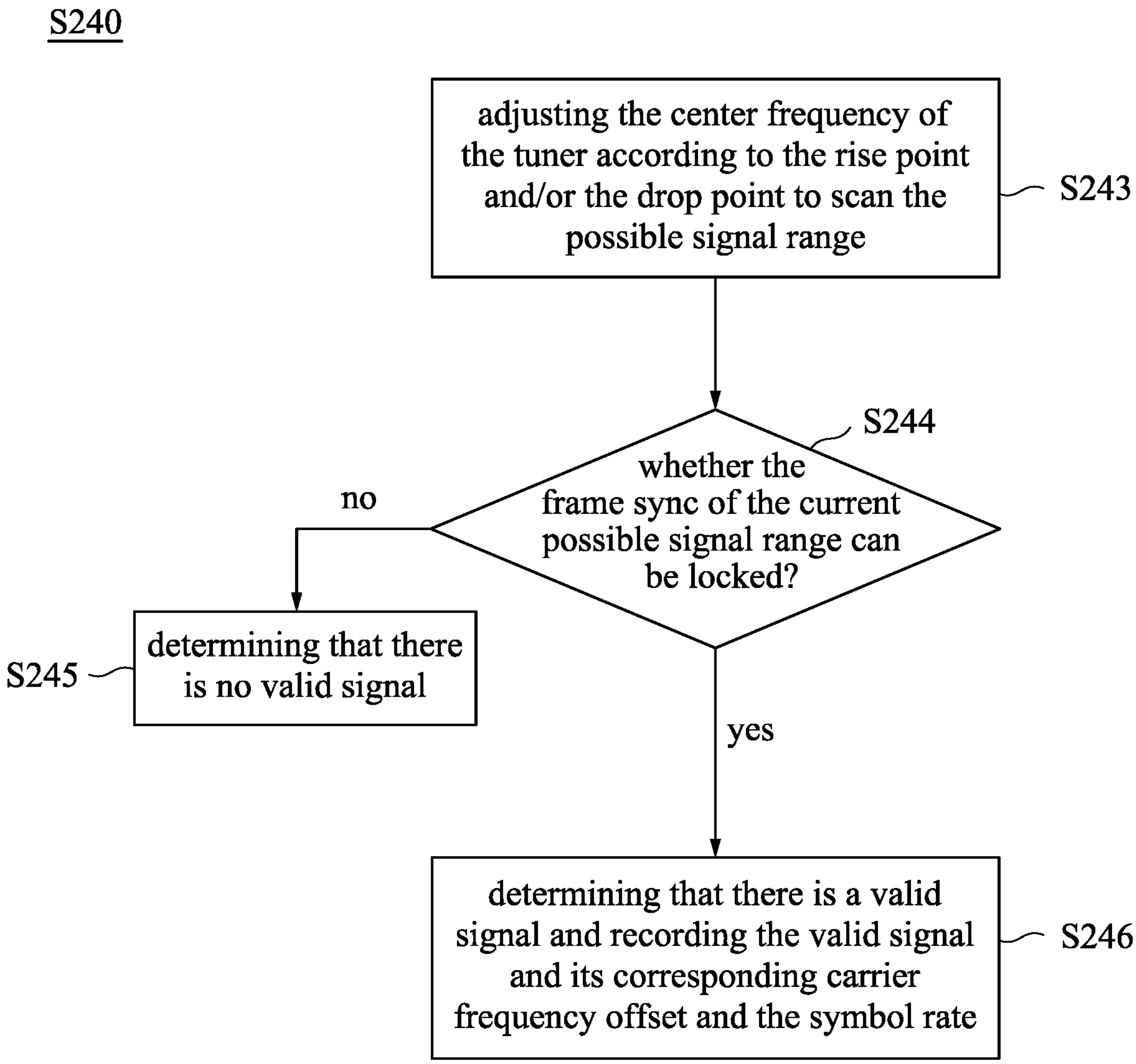

S240
adjusting the center frequency of the tuner according to the rise point and/or the drop point to scan the possible signal range
S243
whether the frame sync of the current possible signal range can be locked?
S244
no
determining that there is no valid signal
S245
yes
determining that there is a valid signal and recording the valid signal and its corresponding carrier frequency offset and the symbol rate
S246

Fig. 2B

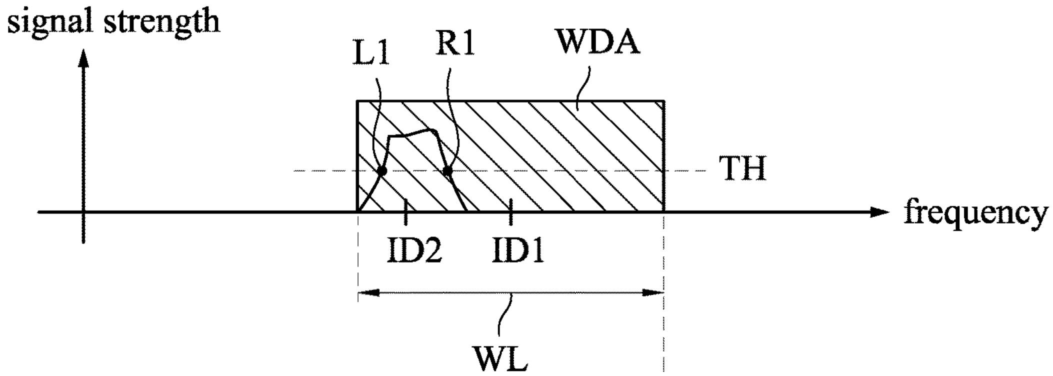


Fig. 3

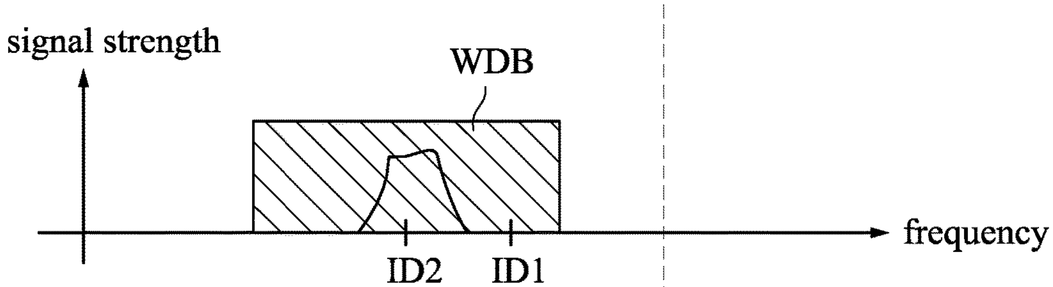


Fig. 4

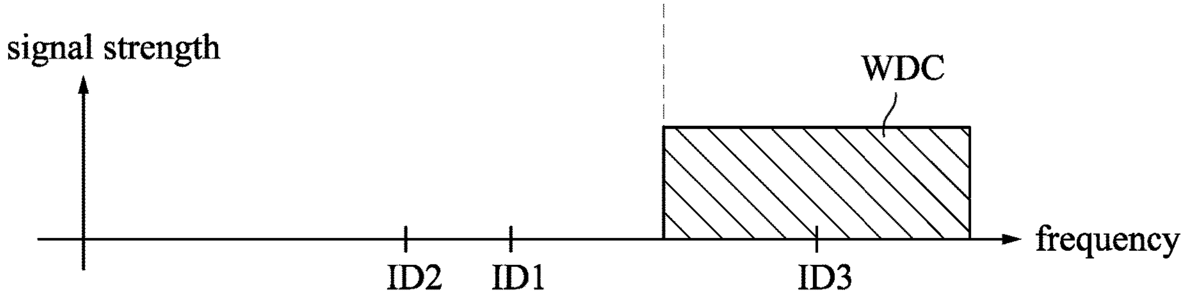


Fig. 5

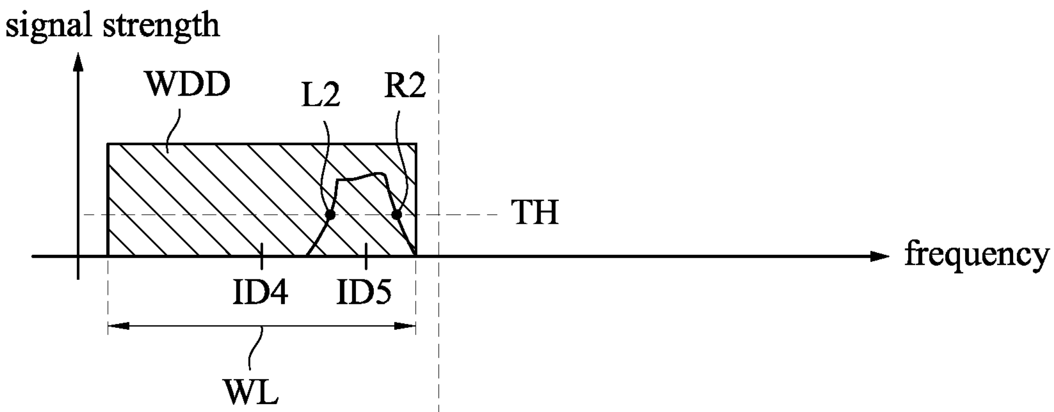


Fig. 6

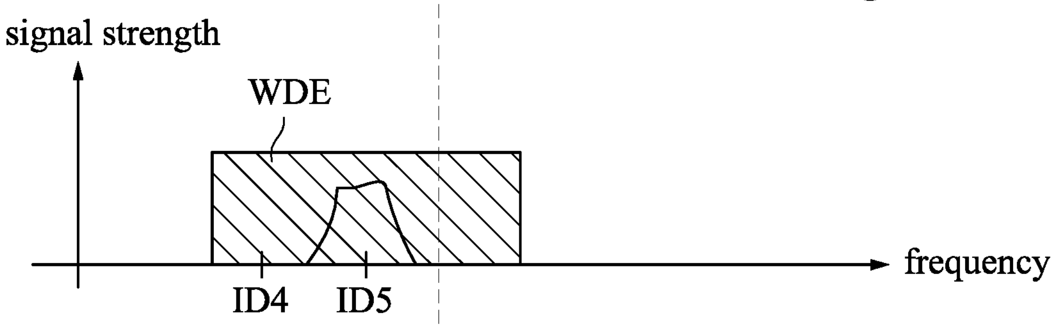


Fig. 7

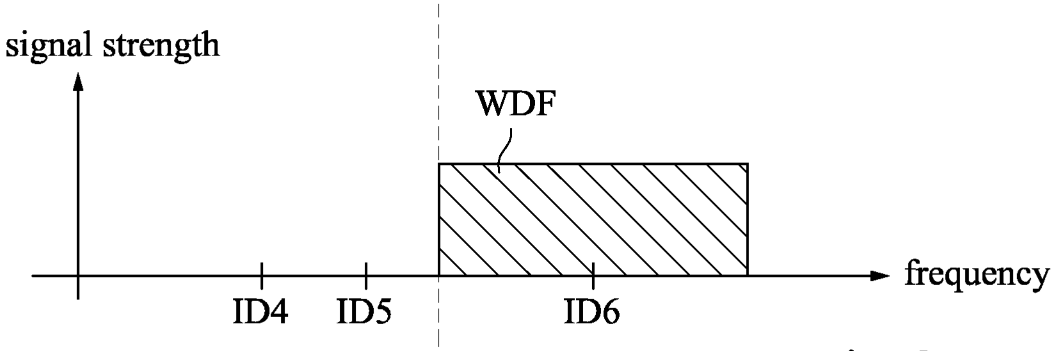


Fig. 8

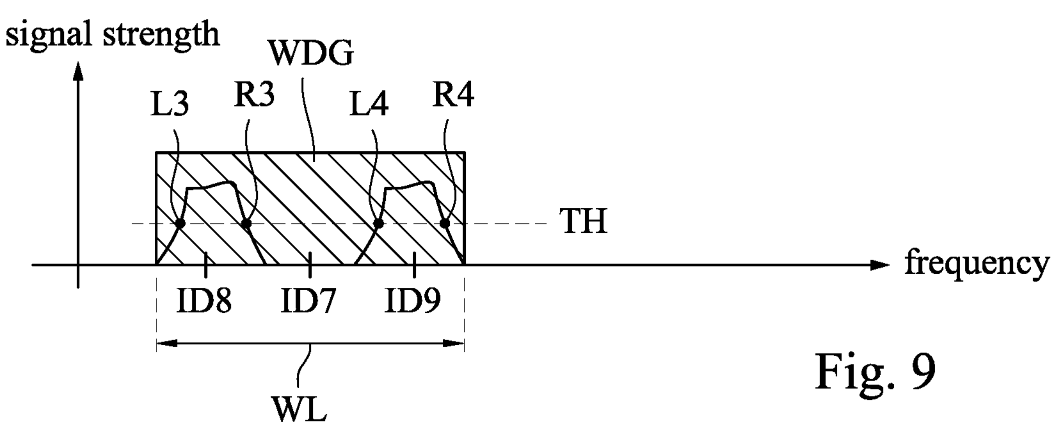


Fig. 9

BLIND SCAN METHOD, NON-TRANSITORY COMPUTER-READABLE MEDIUM AND CONTROL CIRCUIT THEREOF

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the priority benefit of CHINA Application serial no. 202010919402.7, filed Sep. 4, 2020, the full disclosure of which is incorporated herein by reference.

FIELD OF INVENTION

[0002] The present disclosure relates to a blind scan method, a non-transitory computer-readable medium and a control circuit thereof. More particularly, the present disclosure relates to a blind scan method, a non-transitory computer-readable medium and a control circuit thereof applied to cable television transmission.

BACKGROUND

[0003] In wired communication systems, an echo canceler is often used to process the echo power in a channel. However, better echo cancelers require a larger hardware volume. Generally speaking, in a channel, echo power of the echo power (tap) position is small or extremely small and can be selectively ignored. Therefore, those in the field are endeavoring to find ways to reduce the volume of hardware while maintaining the echo processing effect.

SUMMARY

[0004] An aspect of this disclosure is to provide a blind scan method including the following operations: setting a tuner to scan a first spectrum block with a first center frequency as a center and determining whether the first spectrum block comprises a possible signal; adjusting the tuner to scan a second spectrum block with a second center frequency as the center according to a first rise point and a first drop point when it is determined that the first spectrum block comprises the possible signal; and determining whether the second spectrum block comprises a valid signal.

[0005] Another aspect of this disclosure is to provide a non-transient computer readable medium, including at least one program command configured to operate a method, in which the method includes the following operations: setting a tuner to scan a first spectrum block with a first center frequency as a center and determining whether the first spectrum block comprises a possible signal; adjusting the tuner to scan a second spectrum block with a second center frequency as the center according to a first rise point and a first drop point when it is determined that the first spectrum block comprises the possible signal; and determining whether the second spectrum block comprises a valid signal.

[0006] Another aspect of this disclosure is to provide a control circuit configured to set a tuner to scan a first spectrum block with a first center frequency as a center and to determine whether the first spectrum block comprises a possible signal, to adjust the tuner to scan a second spectrum block with a second center frequency as the center according to the first rise point and the first drop point when it is determined that the first spectrum block comprises the possible signal, and to determine whether the second spectrum block comprises a valid signal.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] Aspects of the present disclosure are best understood from the following detailed description when read with the accompanying figures. It is noted that, in accordance with the standard practice in the industry, various features are not drawn to scale. In fact, the dimensions of the various features may be arbitrarily increased or reduced for clarity of discussion.

[0008] FIG. **1** is a schematic diagram illustrating a signal receiving system according to some embodiments of the present disclosure.

[0009] FIG. **2**A is a flow chart illustrating a blind scan method according to some embodiments of the present disclosure.

[0010] FIG. **2**B is a flow chart illustrating a blind scan method according to some embodiments of the present disclosure.

[0011] FIG. **3** is a spectrum diagram illustrating a blind scan method according to some embodiments of the present disclosure.

[0012] FIG. **4** is a spectrum diagram illustrating a blind scan method according to some embodiments of the present disclosure.

[0013] FIG. **5** is a spectrum diagram illustrating a blind scan method according to some embodiments of the present disclosure.

[0014] FIG. **6** is a spectrum diagram illustrating a blind scan method according to some embodiments of the present disclosure.

[0015] FIG. **7** is a spectrum diagram illustrating a blind scan method according to some embodiments of the present disclosure.

[0016] FIG. **8** is a spectrum diagram illustrating a blind scan method according to some embodiments of the present disclosure.

[0017] FIG. **9** is a spectrum diagram illustrating a blind scan method according to some embodiments of the present disclosure.

DETAILED DESCRIPTION

[0018] The following disclosure provides many different embodiments, or examples, for implementing different features of the invention. Specific examples of elements and arrangements are described below to simplify the present disclosure. These are, of course, merely examples and are not intended to be limiting. In addition, the present disclosure may repeat reference numerals and/or letters in the various examples. This repetition is for the purpose of simplicity and clarity and does not in itself dictate a relationship between the various embodiments and/or configurations discussed.

[0019] The terms used in this specification generally have their ordinary meanings in the art, within the context of the invention, and in the specific context where each term is used. Certain terms that are used to describe the invention are discussed below, or elsewhere in the specification, to provide additional guidance to the practitioner regarding the description of the invention.

[0020] FIG. **1** is a schematic diagram illustrating a signal receiving system **100** according to some embodiments of the present disclosure. The signal receiving system **100** includes a tuner **110** and a control circuit **130**. The tuner **110** and the control circuit **130** are coupled to each other. The signal receiving system **100** illustrated in FIG. **1** is for illustrative purposes only and the embodiments of the present disclosure are not limited thereto. Details related to the operation method of the signal receiving system **100** will be explained with reference to FIG. **2**A below.

[0021] Reference is made to FIG. **2**A. FIG. **2**A is a flow chart illustrating a blind scan method **200** according to some embodiments of the present disclosure. However, the embodiments of the present disclosure are not limited thereto.

[0022] It should be noted that the blind scan method can be applied to systems with the same or similar structure as the signal receiving system **100** in FIG. **1**. For ease of explanation, FIG. **1** will be taken as an example below to describe the operation method, but the present invention is not limited to the application of FIG. **1**.

[0023] It should be noted that, in some embodiments, the blind scan method **200** can also be implemented as a computer program and stored in a non-transient computer readable medium, so that a computer, an electronic device, or the aforementioned control circuit **130** shown in FIG. **1** reads the recording medium and executes the operation method. The control circuit **130** may be composed of one or more chips. The computer program can be stored in a non-transitory computer readable medium such as a ROM (read-only memory), a flash memory, a floppy disk, a hard disk, an optical disc, a flash disk, a flash drive, a tape, a database accessible from a network, or any storage medium with the same functionality that can be contemplated by persons of ordinary skill in the art to which this invention pertains.

[0024] Furthermore, is should be noted that the sequence of operations of the operation method mentioned in the present embodiment can be adjusted according to actual needs, except for when a sequence is specifically stated, and the operations can even be executed simultaneously or partially simultaneously.

[0025] Furthermore, in different embodiments, these operations may also be added, replaced, and/or omitted as needed.

[0026] Reference is made to FIG. **2**A. The blind scan method **200** includes the operations as outlined below.

[0027] In operation S**210**, an initial frequency is selected from a band to be scanned. In some embodiments of the present disclosure, operation S**210** can be executed by the control circuit **130** as shown in FIG. **1**. For example, the control circuit **130** may select a frequency of 50 Mhz as the initial frequency, but the implementation of the present disclosure is not limited thereto.

[0028] In operation S**220**, a tuner is set to scan a spectrum block with the initial frequency as the center frequency. In some embodiments, operation S**220** can be executed by the control circuit **130** as shown in FIG. **1**. For example, the control circuit **130** controls the tuner **110** to scan the range of a spectrum block with 50 Mhz as the center frequency. Another example is given with reference made additionally to FIG. **3**. FIG. **3** is a spectrum diagram illustrating a blind scan method according to some embodiments of the present disclosure. As illustrated in FIG. **3**, if the control circuit **130** sets the tuner **110** with the center frequency ID**1** as the center frequency, the tuner **110** scans the spectrum block WDA with the frequency ID**1** as the center.

[0029] In operation S**230**, a determination is made as to whether the spectrum block includes a possible signal. In some embodiments, operation S**230** can be executed by the tuner **110** controlled by the control circuit **130** as shown in FIG. **1**. In some embodiments, when it is determined that a rise point and/or a drop point is included in the scanning range, the control circuit **130** determines that a possible signal is included in the scanning range, and operation S**240** is executed. On the other hand, when it is determined that a rise point and/or a drop point is not included in the scanning range, the control circuit **130** determines that a possible signal is not included in the scanning range, and operation S**250** is executed.

[0030] For example, referring to FIG. **3**, a threshold value TH is set in the control circuit **130**. When operation S**230** is executed, the control circuit **130** controls the tuner **110** to search for spectrum points that intersect the threshold value TH in the spectrum block WDA, and when a rise point L**1** and/or a drop point R**1** are obtained, it is determined that a possible signal is included.

[0031] In greater detail, when the control circuit **130** controls the tuner **110** to obtain the spectrum points that intersect with the threshold value TH, the control circuit **130** obtains a left value of the spectrum point and a right value of the spectrum point. When the left value is smaller than the right value, it is determined that the spectrum point obtained is a rise point. On the other hand, when the left value is larger than the right value, it is determined that the spectrum point obtained is a drop point. For example, as illustrated in FIG. **3**, when the left value of the spectrum point L**1**, that is, the signal intensity value of the frequency to the left side of the spectrum point L**1**, is smaller than the right value of the spectrum point L**1**, that is, the signal intensity value of the frequency of the right side of the spectrum point L**1**, it is determined that the spectrum point L**1** is a rise point. On the other hand, when the left value of the spectrum point R**1**, that is, the signal intensity value of the left side of the spectrum point R**1**, is larger than the right value of the spectrum point R**1**, that is, when the signal intensity value of the frequency of the right side of the spectrum point R**1**, it is determined that the spectrum point R**1** is a drop point.

[0032] In operation S**240**, a valid signal determination is performed. In some embodiments, operation S**240** is executed by the control circuit **130** as illustrated in FIG. **1**. The flow of operation S**240** will be described below with reference to FIG. **2**B.

[0033] Reference is made to FIG. **2**B. Operation S**240** includes operations as outlined below.

[0034] In operation S**243**, the center frequency of the tuner is adjusted according to the rise point and/or the drop point to scan the possible signal range. In some embodiments, the control circuit **130** adjusts the center frequency of the tuner **110** according to the rise point and/or the drop point. In some embodiments, the control circuit **130** calculates the position of the rise point and the average value position of the position of the drop point, and the center frequency of the tuner **110** is set to be moved to the average value position of the position of the rise point and the position of the drop point.

[0035] An example is given with reference to FIG. **3**. The average value of the rise point L**1** and the drop point R**1** on the spectrum is frequency ID**2**. After the control circuit **130** calculates the average value position, the center frequency of the tuner **110** is moved to the frequency ID**2**, as illustrated in FIG. **4**. Referring to FIG. **4**, after the center frequency of the tuner **110** moves to take the frequency ID**2** as the center, the possible signal range is the spectrum block WDB, and the tuner **110** scans the spectrum block WDB.

[0036] Another example is given with reference to FIG. **6**. The average value position of the position of the rise point L**2** and the position of the drop point R**2** is frequency ID**5**. After the control circuit **130** calculates the average value position, the center frequency of the tuner **110** is moved to the frequency ID**5**, as illustrated in FIG. **7**. Referring to FIG. **7**, after the center frequency of the tuner **110** is moved to take the frequency ID**5** as the center, the possible signal range is the spectrum block WDE, and the tuner **110** scans the spectrum block WDE.

[0037] In some embodiments, the spectrum point intersecting the threshold value TH includes not only one set of rise point and/or drop point. As an example, referring to FIG. **9**, the spectrum points intersecting the threshold value TH include a set consisting of the rise point L**3** and the drop point R**3** and a set consisting of the rise point L**4** and the drop point R**4**, that is, two sets of rise points and drop points. In this case, the center frequency will first move to the average value position ID**8** of the first set of the rise point L**3** and the drop point R**3** to scan the possible signal range, and then, the center frequency moves to the average value position ID**9** of the second set of the rise point L**4** and the drop point R**4** to scan the possible signal range.

[0038] In operation S**244**, a determination is made as to whether the frame sync of the current possible signal range can be locked. If it is determined that the frame sync of the current possible signal range can be locked, operation S**246** is performed. On the other hand, if it is determined that the frame sync of the current possible signal range is unable to be locked, operation S**245** is performed. An example is given with reference to FIG. **4**. The control circuit **130** in FIG. **4** determines whether the frame sync of the spectrum block WDB can be locked.

[0039] In some embodiments, when it is determined that the frame sync of the current possible signal range cannot be locked, that is, when the valid signal is not included, and the adjusted center frequency is located to the left side of the center frequency before adjustment, the control circuit **130** lowers the center frequency of the tuner **110** by a fixed frequency, that is, a left shift in the spectrum diagram, to obtain the scan result of the spectrum block (not shown) centered on the down-tuned frequency, and to determine whether the spectrum block centered on the down-tuned frequency contains a valid signal.

[0040] An example is given with reference to FIG. **3** and FIG. **4**. If it is determined that the spectrum block WDB does not include a valid signal, and the spectrum block WDB is located at the left side of the spectrum block WDA, the control circuit **130** lowers the tuner **110** by a fixed frequency. In some embodiments, the fixed frequency used by the tuner **110** is 0.9 MHz, and the frequency ID**2** is 47 MHz. At this time, the center frequency of the tuner **110** is moved from 47 MHz to 46.1 MHz. Next, the control circuit **130** determines whether a valid signal is included in the spectrum block centered at the frequency 46.1 MHz.

[0041] However, it should be noted that, in the above operation, the center frequency of the tuner **110** can be lowered in a limited range. In greater detail, after the center frequency of the tuner **110** is lowered by a fixed frequency, if the center frequency of the tuner **110** exceeds the range of the spectrum block WDA, the center frequency of the tuner **110** will no longer be lowered. For example, as illustrated in FIG. **3**, assuming that the range of the spectrum block WDA is from a frequency of 46 MHz to a frequency of 54 MHz, in the above operation, the center frequency of the tuner **110** cannot be lowered below 46 MHz.

[0042] Similarly, in some embodiments, when it is determined that the frame sync of the current possible signal range cannot be locked and the adjusted center frequency is located to the right side of the center frequency before adjustment, the control circuit **130** increases the center frequency of the tuner **110** by a fixed frequency. That is, the right shift in the spectrum diagram to obtain the scan result of the spectrum block (not shown) centered on the frequency is increased, and it is determined whether the spectrum block centered on the frequency increased includes a valid signal.

[0043] An example is given with reference to FIG. **6** and FIG. **7**. If it is determined that the spectrum block WDE does not include a valid signal, and the spectrum block WDE is located to the right side of the spectrum block WDD, the tuner **110** is increased by a fixed frequency. In some embodiments, the fixed frequency increased by the tuner **110** is 0.9 MHz. If the frequency position ID**5** is 52.5 MHz, the center frequency of the tuner **110** will be moved from the frequency 52.5 MHz to the frequency 53.4 MHz.

[0044] Similarly, it should be noted that, in some embodiments, in this operation, the range of the center frequency of the tuner **110** is limited. In greater detail, after the center frequency of the tuner **110** is increased by a fixed frequency, if its center frequency exceeds the range of the spectrum block WDD, the center frequency of the tuner **110** will not be increased at this time. For example, as shown in FIG. **6**, assuming that the range of the first spectrum block WDD is from a frequency a 46 MHz to a frequency of 54 MHz, in operation S**270**, the center frequency of the tuner **110** cannot be adjusted higher than 54 MHz.

[0045] In operation S**245**, it is determined that there is no valid signal.

[0046] In operation S**246**, it is determined that there is a valid signal, and the valid signal and its corresponding carrier frequency offset (CFO) and the symbol rate are recorded. An example is given with reference to FIG. **4**. If it is determined that the current signal range (that is, the spectrum block WDB) is a valid signal, the control circuit **130** determines that there is a valid signal and records the valid signal and its corresponding frequency offset (CFO) and symbol rate (SR).

[0047] Reference is made to FIG. **2**A again. In operation S**250**, the next center frequency is determined according to the current center frequency, the rise point frequency, the drop point frequency, or at least one of the frequency offset of the valid signal, symbol rate of the valid signal, and the bandwidth of the spectrum block.

[0048] In greater detail, in some embodiments, if in the previous operation, that is, operation S**240** or operation S**230**, it is determined that there is no valid signal or no possible signal, the current center frequency plus the bandwidth of the scanned spectrum block is the next center frequency.

[0049] On the other hand, if in the previous operation, that is, operation S**240** or operation S**230**, it is determined that there is a valid signal and the adjusted center frequency in operation S**243** is located at the left side of the center frequency before adjustment, that is, the adjusted center frequency is lower than the center frequency before adjustment, the next center frequency is the center frequency before adjustment plus the bandwidth of the scanned spectrum block. If in the previous operation it is determined that there is a valid signal and the adjusted center frequency in operation S243 is located at the right side of the center frequency before adjustment, that is, the adjusted center frequency is higher than the center frequency before adjustment, the next center frequency is the adjusted center frequency plus the frequency offset of the recorded valid signal plus half of the symbol rate of the valid signal plus half of the bandwidth of the spectrum block.

[0050] An example is given with reference to FIG. **3** to FIG. **5**. The center frequency ID**1** in FIG. **3** is the center frequency before adjustment, and the center frequency ID**2** in FIG. **4** is the center frequency after adjustment. Since the center frequency ID**1** before adjustment is located at the right side of the adjusted center frequency ID**2**, the next center frequency is the center frequency ID**1** before adjustment plus the bandwidth WL of the scanned spectrum block WDA. After calculation, the next scan center is the frequency center ID**3** shown in FIG. **5**.

[0051] Another example is given with reference to FIG. **6** to FIG. **8**. The center frequency ID**4** in FIG. **6** is the center frequency before adjustment, and the center frequency ID**5** in FIG. **7** is the center frequency after adjustment. Since the adjusted center frequency ID**5** is located at the right side of the center frequency ID**4** before adjustment, the next center frequency is the adjusted center frequency ID**5** plus the frequency offset of the recorded valid signal plus half of the symbol rate of the valid signal plus half of the bandwidth WL of the spectrum block WDD. After calculation, the next scan center is the frequency center ID**6** as shown in FIG. **8**.

[0052] In some embodiments, when the determination result in operation S**240** includes more than two valid signals, the valid signal with the highest center frequency, that is, the valid signal located on the far right side of the spectrum, is used as the adjusted center frequency. For example, in the case of FIG. **9**, the average value position ID**9** of the second set of rise point L**4** and drop point R**4** will be used as the adjusted center frequency, and the adjusted center frequency ID**9** plus the frequency offset of the recorded valid signal plus half of the symbol rate of the valid signal plus half of the bandwidth WL of the spectrum block WDD determines the next center frequency.

[0053] In operation S**260**, a determination is made as to whether the next center frequency is greater than the highest threshold value. In some embodiments, operation S**260** may be executed by the control circuit **130** as illustrated in FIG. **1**. In some embodiments, the highest threshold value is 858 MHz. However, the embodiments of the present disclosure are not limited thereto.

[0054] In operation S**270**, the scanning process is ended. That is, the current scanning process is ended.

[0055] In operation S**280**, the next spectrum block is scanned according to the next center frequency. In some embodiments, operation S**280** can be executed by the control circuit **130** as illustrated in FIG. **1**. An example is given with reference to FIG. **5**. After the center frequency moves to the center frequency ID**3**, the control circuit **130** controls the tuner **110** to scan the spectrum block WDC according to the center frequency ID**3**. Another example is given with reference to FIG. **8**. After the center frequency moves to the center frequency ID**6**, the control circuit **130** controls the tuner **110** to scan the spectrum block WDF according to the center frequency ID**6**.

[0056] The blind scan method **200** of the present disclosure scans from the left end of the spectrum to the right end of the spectrum, so as to complete the scan of all the spectrums and find the valid signal. In one embodiment, after all the valid signals are found, the frequency corresponding to the valid signal can be stored in the memory (not shown in the figure). For example, the frequency can be a channel of a TV station. In this way, the user can adjust the TV station for previewing accordingly.

[0057] The above-mentioned values of frequency modulation bandwidth, movement distance, and frequency position are for illustrative purposes only, and the embodiments of the present disclosure are not limited thereto.

[0058] In some embodiments, the control circuit **130** may be a server, a circuit, or a central processing unit (CPU), microprocessor (MCU) or another device with functions such as storage, calculation, data reading, receiving signals or messages, and transmitting signals or messages or other equivalent functions.

[0059] According to embodiments of the present disclosure, it is understood that the embodiments of the present disclosure provide a blind scan method, a non-transitory computer-readable medium and a control circuit thereof. With the method of searching the signal rise point and drop point on the spectrum, the frequency of the signal in the tuner range can be determined quickly, and during the next adjustment, the center frequency of the tuner is adjusted to the spectrum that is not covered by the blind scan spectrum block, in which the frequency of the valid signal can be scanned out faster.

[0060] In addition, the above illustrations comprise sequential demonstration operations, but the operations need not be performed in the order shown. The execution of the operations in a different order is within the scope of this disclosure. In the spirit and scope of the embodiments of the present disclosure, the operations may be increased in number, substituted, changed and/or omitted as the case may be.

[0061] The foregoing outlines features of several embodiments so that those skilled in the art may better understand the aspects of the present disclosure. Those skilled in the art should appreciate that they may readily use the present disclosure as a basis for designing or modifying other processes and structures for carrying out the same purposes and/or achieving the same advantages of the embodiments introduced herein. Those skilled in the art should also realize that such equivalent constructions do not depart from the spirit and scope of the present disclosure, and that they may make various changes, substitutions, and alterations herein without departing from the spirit and scope of the present disclosure.

What is claimed is:

1. A blind scan method, comprising:

setting a tuner to scan a first spectrum block with a first center frequency as a center and determining whether the first spectrum block comprises a possible signal;

adjusting the tuner to scan a second spectrum block with a second center frequency as the center according to a first rise point and a first drop point when it is determined that the first spectrum block comprises the possible signal; and

determining whether the second spectrum block comprises a valid signal.

2. The blind scan method of claim **1**, further comprising:
setting a threshold value; and
searching at least one spectrum point intersecting with the threshold value in the first spectrum block to obtain the first rise point or the first drop point.

3. The blind scan method of claim **2**, further comprising:
obtaining a left value of the at least one spectrum point and a right value of the at least one spectrum point;
determining that the at least one spectrum point is the first rise point when the left value is smaller than the right value; and
determining that the at least one spectrum point is the first drop point when the left value is larger than the right value.

4. The blind scan method of claim **1**, further comprising:
calculating a first average value of the first rise point and the first drop point; and
setting the first average value to be the second center frequency.

5. The blind scan method of claim **1**, further comprising:
setting the tuner to scan a third spectrum block with a third center frequency as the center, wherein the third spectrum block does not overlap with the first spectrum block.

6. The blind scan method of claim **5**, wherein when it is determined that the second spectrum block does not include the valid signal or does not include the possible signal, the third center frequency is the second center frequency adding a bandwidth of the first spectrum block.

7. The blind scan method of claim **5**, wherein when it is determined that the second spectrum block comprises the valid signal and the second center frequency is higher than the first center frequency, the third center frequency is the second center frequency adding a frequency offset value, half of a symbol rate and half of a bandwidth of the first spectrum block.

8. The blind scan method of claim **5**, wherein when it is determined that the second spectrum block comprises the valid signal and the second center frequency is lower than the first center frequency, the third center frequency is the first center frequency adding a bandwidth of the first spectrum block.

9. The blind scan method of claim **1**, further comprising:
calculating a fourth center frequency according to a second rise point and a second drop point when the first spectrum block further comprises the second rise point and the second drop point; and
setting the tuner to perform scanning with the second center frequency as the center and then setting the tuner to perform scanning with the fourth center frequency as the center when the fourth center frequency is higher than the second center frequency.

10. The blind scan method of claim **1**, further comprising:
setting the tuner to perform scanning with a third center frequency as the center when it is determined that the second spectrum block does not include the valid signal and the second spectrum block is located at a left side of the first spectrum block, wherein the third center frequency is obtained by the second center frequency being lowered by a fixed frequency; and
setting the tuner to perform scanning with a fourth center frequency as the center when it is determined that the second spectrum block does not comprise the valid signal and the second spectrum block is located at a right side of the first spectrum block, wherein the fourth center frequency is obtained by the second center frequency being increased by the fixed frequency.

11. The blind scan method of claim **10**, wherein when the third center frequency or the fourth center frequency obtained after the second center frequency is lowered or increased exceeds a range of the first spectrum block, the second center frequency is not increased or lowered.

12. A non-transient computer readable medium, comprising at least one program command configured to operate a method, wherein the method comprises:
setting a tuner to scan a first spectrum block with a first center frequency as a center and determining whether the first spectrum block comprises a possible signal;
adjusting the tuner to scan a second spectrum block with a second center frequency as the center according to a first rise point and a first drop point when it is determined that the first spectrum block comprises the possible signal; and
determining whether the second spectrum block comprises a valid signal.

13. The non-transient computer readable medium of claim **12**, the method further comprising:
setting a threshold value; and
searching at least one spectrum point intersecting with the threshold value in the first spectrum block, to obtain the first rise point or the first drop point.

14. The non-transient computer readable medium of claim **12**, the method further comprising:
calculating a first average value of the first rise point and the first drop point; and
setting the first average value to be the second center frequency.

15. The non-transient computer readable medium of claim **12**, the method further comprising:
setting the tuner to scan a third spectrum block with a third center frequency as the center, wherein the third spectrum block does not overlap with the first spectrum block.

16. The non-transient computer readable medium of claim **15**, wherein setting the tuner to scan the third spectrum block with the third center frequency as the center comprises:
when it is determined that the second spectrum block does not comprise the valid signal or does not comprise the possible signal, the third center frequency is the second center frequency adding a bandwidth of the first spectrum block;
when it is determined that the second spectrum block comprises the valid signal and when the second center frequency is lower than the first center frequency, the third center frequency is the first center frequency adding a bandwidth of the first spectrum block; and
when it is determined that the second spectrum block comprises the valid signal and when the second center frequency is higher than the first center frequency, the third center frequency is the second center frequency adding a frequency offset value, half of a symbol rate and half of a bandwidth of the first spectrum block.

17. The non-transient computer readable medium of claim **12**, the method further comprising:
setting the tuner to perform scanning with a third center frequency as the center when it is determined that the second spectrum block does not comprise the valid signal and the second spectrum block is located at a left

side of the first spectrum block, wherein the third center frequency is obtained by the second center frequency being lowered by a fixed frequency; and

setting the tuner to perform scanning with a fourth center frequency as the center when it is determined that the second spectrum block does not comprise the valid signal and the second spectrum block is located at a right side of the first spectrum block, wherein the fourth center frequency is obtained by the second center frequency being increased by the fixed frequency; and

wherein if the third center frequency or the fourth center frequency obtained after the second center frequency is lowered or increased exceeds a range of the first spectrum block, the second center frequency is not increased or lowered.

18. A control circuit, configured to set a tuner to scan a first spectrum block with a first center frequency as a center and to determine whether the first spectrum block comprises a possible signal, to adjust the tuner to scan a second spectrum block with a second center frequency as the center according to a first rise point and a first drop point when it is determined that the first spectrum block comprises the possible signal, and to determine whether the second spectrum block comprises a valid signal.

19. The control circuit of claim **18**, wherein the control circuit is configured to set a threshold value, to search at least one spectrum point intersecting with the threshold value in the first spectrum block, to obtain the first rise point or the first drop point, and to set a first average value of the first rise point and the first drop point to be the second center frequency.

20. The control circuit of claim **18**, wherein the control circuit is further configured to set the tuner to scan a third spectrum block with a third center frequency as the center, wherein the third spectrum block does not overlap with the first spectrum block.

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