Description

BACKGROUND OF THE INVENTION

i) Field of the invention:

The present invention relates to a sensitivity switching circuit for a radio receiver having an AGC (automatic gain control) circuit.

ii) Description of the related arts:

Conventionally, many radio receivers are provided with an automatic broadcasting station selector to be operated by one touch. That is, by pushing an automatic station selection button arranged on an operational panel of a radio receiver body, receiving frequencies are automatically changed, and at a frequency (of a broadcasting signal) of which an field strength of a received radio signal is more than a predetermined value, the frequency change is stopped. Consequently, receiving broadcasting stations can be changed in consecutive order every pushing of the automatic station selection button.

However, in this automatic station selection system, when there is no broadcasting station in the neighborhood, it is desired to successively select relatively weak radio signal transmitted by far away broadcasting stations. On the other hand, when there are many broadcasting stations in the neighborhood, it is demanded to select only relatively strong radio signal of good sound quality, and in this case, relatively strong noises occur. Hence, in the automatic broadcasting station selection, the noise is sometimes selected.

Accordingly, in the conventional radio receivers, a Lo (short distance) /DX (long distance) change switch is provided. In the Lo mode, a stop level in the automatic broadcasting station selection can be raised so as to perform the station selection only when the receiving radio signal strength is fairly strong.

In Fig. 1, there is shown a conventional radio receiver including a Lo/DX sensitivity switching circuit. A similar circuit is also shown in US-A-4 313 218. In the drawing, an RF (radio frequency) signal is received by an antenna 1 and is applied to a damping circuit 2 for damping the RF signal and an RF amplifier circuit 3 for amplifying the RF signal through a capacitor 1a. Usually, an FET is used for the RF amplifier circuit 3. To the RF amplifier circuit 3, a tuned circuit 4 for picking up an RF signal having a certain frequency, a mixer 5 for mixing an output signal of the tuned circuit 4 with an output signal of a local oscillator (not shown) to output an intermediate frequency (IF) signal, an IF amplifier circuit 6 for amplifying the IF signal and a detector circuit 7 for detecting an amplified IF signal to reproduce an audio signal are successively connected in series. That is, from the broadcasting RF signal received by the antenna 1, an RF signal having the desired frequency is picked up and is then converted into the IF signal, and then the IF signal is amplified and then detected to reproduce the audio signal.

The damping circuit 2 includes a capacitor 2a and two pin diodes 2b and 2c whose respective anode and cathode are connected to the capacitor 2a. By applying a certain current to the anode of the pin diode 2c, the two pin diodes are switched on, and a part of the RF signal received by the antenna 1 is passed to the ground to carry out a damping.

Further, to the output of the mixer 5, a level detector circuit 8 for detecting the level of the output signal of the mixer 5 is connected, and a detected value by the level detector circuit 8 is fed to an AGC driver circuit 9. The AGC driver circuit 9 controls the RF amplifier circuit 3 and the damping circuit 2 so that the output signal of the level detector circuit 8 may be a predetermined level. That is, in case of a relatively small amplification factor control, the AGC driver circuit 9 sends a control signal to the RF amplifier circuit 3 to control an amplification factor. Then, when the receiving signal strength becomes more than a predetermined value, currents are applied to the two pin diodes of the damping circuit 2 to impart a certain damping to the received RF signal prior to the RF amplifier circuit 3. As a result, saturation of the FET constituting the RF amplifier circuit 3 can be prevented.

A Lo/DX change switch 10 arranged on an operational panel of a radio receiver body is switched to control ON and OFF of a supply of current to a Lo/DX switch driver circuit 11 connected to the pin diode 2c of the damping circuit 2. When the Lo/DX change switch 10 is switched on in the Lo mode, a current is supplied from the Lo/DX switch driver circuit 11 to the pin diode 2c to switch on the damping circuit 2, and the damping circuit 2 gives a predetermined damping to the received RF signal. Hence, the signal strength of the selected broadcasting radio signal in the automatic broadcasting station selection can be substantially increased, and thus only the broadcasting stations with a strong field strength can be selected.

In the conventional sensitivity switching circuit, to the damping circuit 2, both the AGC driver circuit 9 and the Lo/DX switch driver circuit 11 are linked. Accordingly, when the Lo/DX change switch 10 is switched on in the Lo mode during the operation of the damping circuit 2 by the AGC driver circuit 9, the sensitivity can not be changed at all.

Further, in the Lo mode, even when the AGC driver circuit 9 supplies the current to the damping circuit 2, the received RF signal can not be damped. Hence, in this case, the AGC operation delay can be caused.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a sensitivity switching circuit for a radio receiver, free from the aforementioned defects and disadvantages of the prior art, which is capable of carrying out a damping of a predetermined sensitivity of a signal in a Lo mode while a desired AGC function is performed.

In accordance with one aspect of the present invention, there is provided a sensitivity switching circuit for a radio receiver, comprising an amplifier circuit for amplifying an RF signal to output an amplified RF signal; a damping circuit for damping the RF signal with a variable damping amount before the RF signal is input to the amplifier circuit; a tuned circuit for picking up a signal having a particular frequency from the amplified RF signal output from the amplifier circuit to output a tuned signal; an AGC circuit for detecting a level of the tuned signal output from the tuned circuit and controlling the damping amount of the damping circuit; a level damper circuit arranged outside a control loop of the AGC circuit, for damping the tuned signal output from the tuned circuit with a changeable damping amount to output a level-damped signal; and a mixer circuit for receiving the level-damped signal output from the level damper circuit and mixing another signal with the level-damped signal to obtain an intermediate frequency signal.

The damping amount of the level damper circuit can be changed according to on and off of a switch.

In another sensitivity switching circuit, the level damper circuit and the mixer circuit can be preferably integrated.

In a preferred sensitivity switching circuit, the level damper circuit controls a signal currents flowing in the mixer circuit.

Further, the level damper circuit can include a pair of constant current circuits and switch the currents flowing in the mixer circuit by selecting one of the constant current circuits.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will more fully appear from the following description of the preferred embodiments with reference to the accompanying drawings, in which:

Fig. 1 is a schematic block diagram of a conventional radio receiver including a sensitivity switching circuit;

Fig. 2 is a schematic block diagram of a radio receiver including a sensitivity switching circuit according to the present invention; and

Fig. 3 is a circuit diagram of a mixer including a level damper therein for a sensitivity switching circuit for a radio receiver according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, wherein like reference characters designate like or corresponding parts throughout the several views and thus the repeated description thereof can be omitted for brevity, there is shown in Fig. 2 a radio receiver including a sensitivity switching circuit according to the present invention.

In the drawing, an antenna 1, a damping circuit 2, an RF amplifier circuit 3, a tuned circuit 4, a mixer 5, an IF amplifier circuit 6, a detector circuit 7, a level detector circuit 8, an AGC driver circuit 9, a Lo/DX change switch 10 and a Lo/DX switch driver circuit 11 have the same structures as those of the conventional radio receiver shown in Fig. 1.

In this embodiment, a level damper 12 to be switched on or off by the Lo/DX change switch 10 in the Lo or DX mode is arranged between the tuned circuit 4 and the mixer 5, that is, the input of the level damper 12 is connected to an input point P for the signal level detection by the level detector circuit 8 after the tuner circuit 4. When the Lo/DX change switch is switched on in the Lo mode, the level damper 12 is switched on to damp the level of the signal to be input to the mixer 5. A local oscillator 13 outputs a local oscillation signal having a predetermined frequency to the mixer 5 in order to obtain an IF (intermediate frequency) signal therein. A frequency change controller 14 receives a signal from the IF amplifier circuit 6 and controls the tuning frequency of the tuned circuit 4 and the oscillation frequency of the local oscillator 13 in order to change the frequency of the signal picked up by the tuned circuit 4.

That is, in the broadcasting station selection, the frequency change controller 14 outputs predetermined signals to the tuned circuit 4 and the local oscillator 13 to control the frequency of the signal picked up by the tuned circuit 4 and the oscillation frequency of the local oscillator 13. Hence, a signal having a particular frequency is picked up from the received RF signal in the tuned circuit 4 and is then converted into an IF signal having a predetermined frequency such as 450 kHz in receiving AM (amplitude modulation) radio signal in the mixer 5. The IF signal is output from the mixer 5 to the IF amplifier circuit 6.

Further, in the automatic broadcasting station selection, the frequency of the signal picked up from the received RF signal is consecutively varied with, for instance, every 9 kHz in receiving the AM radio signal in the tuned circuit 4, and at this time the level of the output signal of the IF amplifier circuit 6 is detected in the frequency change controller 14. When the detected level is at least a predetermined threshold value, the frequency of the signal is fixed to the detected

frequency, and the broadcasting station selection is carried out. On the other hand, when the detected level is less than the predetermined threshold value, the frequency of the signal is changed to a next one, and this operation is repeated.

In this embodiment, the level damper 12 is arranged before the mixer 5 as described above, and the ON-OFF control of the level damper 12 is carried out by the Lo/DX change switch 10 mounted on the operational panel of the receiver body. When the Lo/DX change switch 10 is switched on in the Lo mode, the level damper 12 is switched on, and the level of the signal to be input to the mixer 5 is damped. Hence, the threshold value for the broadcasting station selection to the received RF signal is substantially increased, and as a result, only the stations transmitting the radio signal having the strong field strength can be selected.

In Fig. 3, there is shown a circuit of a mixer 5 including a level damper 12 for a sensitivity switching circuit for a radio receiver according to the present invention. In this embodiment, the signal output from the tuned circuit 4 is input to bases of four transistors Q_1, Q_2, Q_3 and Q_4, and the local oscillation signal output by the local oscillator 13 is input to bases of four transistors Q_5, Q_6, Q_7 and Q_8. There are provided six transistors Q_9, Q_{10}, Q_{11}, Q_{12}, Q_{13} and Q_{14} for supplying constant currents, and two resistors R_1 and R_2 for determining level of the output signal of the mixer 5 are connected between the emitters of the two transistors Q_1 and Q_2 and between the emitters of the two transistors Q_3 and Q_4, respectively.

A first reference voltage V_{R1} is applied to the bases of the two transistors Q_1 and Q_3 through a resistor R_{101} and to the bases of the two transistors Q_2 and Q_4 through a resistor R_{102}, and a second reference voltage V_{R2} is applied to the bases of the three transistors Q_9, Q_{10} and Q_{11} through a resistor R_{103} and to the bases of the three transistors Q_{12}, Q_{13} and Q_{14} through a resistor R_{104}.

The emitters of the six transistors Q_9, Q_{10}, Q_{11}, Q_{12}, Q_{13} and Q_{14} are connected to the ground GND through resistors R_{109}, R_{110}, R_{111}, R_{112}, R_{113} and R_{114}, respectively. The collectors of the two transistors Q_9 and Q_{12} are coupled with the respective bases thereof. The collectors of the two transistors Q_{10} and Q_{11} are connected to the emitters of the two transistors Q_3 and Q_4, respectively, and the collectors of the two transistors Q_{13} and Q_{14} are connected to the emitters of the two transistors Q_1 and Q_2, respectively. The bases of the two transistors Q_2 and Q_4 are linked to the ground GND via a capacitor C_1.

The collectors of the two transistors Q_1 and Q_3 are connected to each other and also to the emitters of the two transistors Q_5 and Q_6 through respective resistors R_{105} and R_{106}, and the collectors of the two transistors Q_2 and Q_4 are connected to each other and also to the emitters of the two transistors Q_7 and Q_8 through respective resistors R_{107} and R_{108}. The collectors of the two transistors Q_5 and Q_7 are linked to one end of a first coil member of a coil L_1, and the collectors of the two transistors Q_6 and Q_8 are connected to the other end of the first coil member. A pair of capacitors C_{L1} and C_{L2} are coupled in series between the one end and the other end of the first coil member, and a voltage Vcc is applied to the midpoint of the first coil member for adjusting the end voltages of the first coil member. As shown in FIG 3, the coupling point of the capacitor C_{L1} to C_{L2} is grounded. From a second coil member of the coil L1 through a ceramic filter F_1, an IF signal formed in the mixer 5 is output.

Now, the signal output from the local oscillator 13 is applied to the bases of the four transistors Q_5 to Q_8 where the signals output from the collectors of the two transistors Q_1 and Q_2 or Q_3 and Q_4 are mixed.

Then, by applying a certain voltage from a constant current switch SW_1 or SW_2 to the bases of the group of the three transistors Q_9, Q_{10} and Q_{11} or Q_{12}, Q_{13} and Q_{14}, respectively, the transistors Q_9, Q_{10} and Q_{11} or Q_{12}, Q_{13} and Q_{14} are switched on. The transistors Q_{10} and Q_{11} together with the transistor Q_9 constitute a current mirror circuit, and the transistors Q_{13} and Q_{14} together with the transistor Q_{12} also constitute a current mirror circuit. Hence, by selecting either the constant current switches SW_1 or SW_2 to apply the voltage, either the transistors Q_{10} and Q_{11} or Q_{13} and Q_{14} can be switched on to flow the currents therein.

Since the transistors Q_1 and Q_2 are switched on in a first state of which the transistors Q_{13} and Q_{14} are switched on, the level of the output signal of the mixer 5 is determined by the resistor R_1 connected between the emitters of the transistors Q_1 and Q_2. On the other hand, since the transistors Q_3 and Q_4 are switched on in a second state of which the transistors Q_{10} and Q_{11} are switched on, the level of the output signal of the mixer 5 is determined by the resistor R_2 connected between the emitters of the transistors Q_3 and Q_4.

Therefore, by making the values of the resistors R_1 and R_2 different from each other, the level of the output signal of the mixer 5 can be changed. For example, by making the value of the resistor R_1 small compared with that of the resistor R_2, the signal level in the first state can be enlarged compared with that in the second state. Hence, when the Lo/DX change switch 10 is off in the DX mode, by switching off the constant current switch SW_1 and switching on the constant current switch SW_2, the currents flow in the three transistors Q_{12}, Q_{13} and Q_{14}, and when the Lo/DX change switch 10 is switched on in the Lo mode, by switching off the constant current switch SW_2 and switching on the constant current switch SW_1, the currents flow in the three transistors Q_9, Q_{10} and Q_{11}, thereby carrying out the desired sensitivity switching.

As described above, in the embodiment, an ON-OFF circuit for damping the signal according to the ON or OFF of the Lo/DX change switch 10 is included in the mixer 5, no level damper 12 shown in Fig. 2 can be required.

In a sensitivity switching circuit for a radio receiver according to the present invention, as described above, a received signal is damped in a damping circuit with a variable damping amount, and the damped signal is amplified in an amplifier circuit. Then, the amplifiered signal is tuned in a tuned circuit to pick up a signal having the desired frequency. Further, an AGC circuit detects a level of the signal output from the tuned circuit and controls the damping amount of the damping circuit. A level damper circuit for damping the signal output from the tuned circuit with a changeable damping amount is arranged in the rear stage of the tuned circuit. The signal damped with a predetermined amount by the level damper circuit is fed to a mixer circuit.

Consequently, an RF signal received by an antenna is amplified in an amplifier circuit and is then tuned in a tuned circuit to pick up a signal having a certain frequency and a certain level. Then, the picked up signal is mixed with another signal to output an IF signal and the IF signal is detected to reproduce the desired broadcasting program. An AGC circuit ensures high and low levels of the received signal to make the received signal to a certain level. Further, a damping circuit capable of switching a damping amount is arranged in the rear stage of the AGC circuit. Hence, the signal can be exactly damped on the bases of a switching signal of Lo/DX.

Further, by including a level damper circuit in a mixer, a whole structure can be simplified.

As described above, in a sensitivity switching circuit for a radio receiver according to the present invention, since a damping circuit to be actuated by a switch is independently arranged in the rear state of an AGC loop, while an AGC circuit is actuated with the desired function, by switching on in a Lo mode, the desired sensitivity damping of the signal can be carried out. Further, since a level damper circuit possesses no frequency characteristic, an exact Lo/DX switching can be carried out.

Although the present invention has been described in its preferred embodiments with reference to the accompanying drawings, it readily understood that the present invention is not restricted to the preferred embodiments and that various changes and modifications can be made by those skilled in the art without departing from the scope of the present invention.

Claims

1. A sensitivity switching circuit for a radio receiver, comprising:

   an amplifier circuit (3) for amplifying an RF signal to output an amplified RF signal;

   a damping circuit (2) for damping the RF signal with a variable damping amount before the RF signal is input to the amplifier circuit;

   a tuned circuit (4) for picking up a signal having a particular frequency from the amplified RF signal output from the amplifier circuit to output a tuned signal;

   an AGC circuit (8,9) for detecting a level of the tuned signal output from the tuned circuit and controlling the damping amount of the damping circuit;

   a level damper circuit (12) arranged outside a control loop of the AGC circuit, for damping the tuned signal output from the tuned circuit with a changeable damping amount to output a level-damped signal; and

   a mixer circuit (5) for receiving the level-damped signal output from the level damper circuit and mixing another signal with the level-damped signal to obtain an intermediate frequency signal.

2. The circuit of claim 1, wherein the damping amount of the level damper circuit is changed according to on and off of a switch (10).

3. The circuit of claim 1, wherein the level damper circuit (12) and the mixer circuit (5) are integrally connected to each other.

4. The circuit of claim 3, wherein the level damper circuit (12) controls input signal currents flowing in the mixer circuit (5).

5. The circuit of claim 4, wherein the level damper circuit (12) includes a pair constant current circuits (Q_9, Q_{10}, Q_{11}, Q_{12}, Q_{13}, Q_{14}) and switches the currents flowing in the mixer circuit (5) by selecting one of the constant current circuits.

Patentansprüche

1. Schaltung zum Schalten der Empfindlichkeit eines Funkempfängers, mit
   einer Verstärkerschaltung (3) zum Verstärken eines RF-Signals, um ein verstärktes RF-Signal auszugeben;
   einer Dämpfschaltung (2) zum Dämpfen des RF-Signals mit einem variablen Dämpfungsgrad bevor das RF-Signal in die Verstärkerschaltung eingeleitet wird;
   einem Abstimmkreis (4) zum Abgreifen eines Signals mit einer bestimmten Frequenz vom verstärkten RF-Signal, daß an der Verstärkerschal-

As described above, in the embodiment, an ON-OFF circuit for damping the signal according to the ON or OFF of the Lo/DX change switch 10 is included in the mixer 5, no level damper 12 shown in Fig. 2 can be required.

In a sensitivity switching circuit for a radio receiver according to the present invention, as described above, a received signal is damped in a damping circuit with a variable damping amount, and the damped signal is amplified in an amplifier circuit. Then, the amplifiered signal is tuned in a tuned circuit to pick up a signal having the desired frequency. Further, an AGC circuit detects a level of the signal output from the tuned circuit and controls the damping amount of the damping circuit. A level damper circuit for damping the signal output from the tuned circuit with a changeable damping amount is arranged in the rear stage of the tuned circuit. The signal damped with a predetermined amount by the level damper circuit is fed to a mixer circuit.

Consequently, an RF signal received by an antenna is amplified in an amplifier circuit and is then tuned in a tuned circuit to pick up a signal having a certain frequency and a certain level. Then, the picked up signal is mixed with another signal to output an IF signal and the IF signal is detected to reproduce the desired broadcasting program. An AGC circuit ensures high and low levels of the received signal to make the received signal to a certain level. Further, a damping circuit capable of switching a damping amount is arranged in the rear stage of the AGC circuit. Hence, the signal can be exactly damped on the bases of a switching signal of Lo/DX.

Further, by including a level damper circuit in a mixer, a whole structure can be simplified.

As described above, in a sensitivity switching circuit for a radio receiver according to the present invention, since a damping circuit to be actuated by a switch is independently arranged in the rear state of an AGC loop, while an AGC circuit is actuated with the desired function, by switching on in a Lo mode, the desired sensitivity damping of the signal can be carried out. Further, since a level damper circuit possesses no frequency characteristic, an exact Lo/DX switching can be carried out.

Although the present invention has been described in its preferred embodiments with reference to the accompanying drawings, it readily understood that the present invention is not restricted to the preferred embodiments and that various changes and modifications can be made by those skilled in the art without departing from the scope of the present invention.

Claims

1. A sensitivity switching circuit for a radio receiver, comprising:

an amplifier circuit (3) for amplifying an RF signal to output an amplified RF signal;

a damping circuit (2) for damping the RF signal with a variable damping amount before the RF signal is input to the amplifier circuit;

a tuned circuit (4) for picking up a signal having a particular frequency from the amplified RF signal output from the amplifier circuit to output a tuned signal;

an AGC circuit (8,9) for detecting a level of the tuned signal output from the tuned circuit and controlling the damping amount of the damping circuit;

a level damper circuit (12) arranged outside a control loop of the AGC circuit, for damping the tuned signal output from the tuned circuit with a changeable damping amount to output a level-damped signal; and

a mixer circuit (5) for receiving the level-damped signal output from the level damper circuit and mixing another signal with the level-damped signal to obtain an intermediate frequency signal.

2. The circuit of claim 1, wherein the damping amount of the level damper circuit is changed according to on and off of a switch (10).

3. The circuit of claim 1, wherein the level damper circuit (12) and the mixer circuit (5) are integrally connected to each other.

4. The circuit of claim 3, wherein the level damper circuit (12) controls input signal currents flowing in the mixer circuit (5).

5. The circuit of claim 4, wherein the level damper circuit (12) includes a pair constant current circuits (Q_9, Q_{10}, Q_{11}, Q_{12}, Q_{13}, Q_{14}) and switches the currents flowing in the mixer circuit (5) by selecting one of the constant current circuits.

Patentansprüche

1. Schaltung zum Schalten der Empfindlichkeit eines Funkempfängers, mit
einer Verstärkerschaltung (3) zum Verstärken eines RF-Signals, um ein verstärktes RF-Signal auszugeben;
einer Dämpfschaltung (2) zum Dämpfen des RF-Signals mit einem variablen Dämpfungsgrad bevor das RF-Signal in die Verstärkerschaltung eingeleitet wird;
einem Abstimmkreis (4) zum Abgreifen eines Signals mit einer bestimmten Frequenz vom verstärkten RF-Signal, daß an der Verstärkerschal-

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tung ausgegeben wird, um ein abgestimmtes Signal auszugeben;
einer automatischen Verstärkungsregelungs (AGC)-Schaltung (8,9) zum Detektieren eines Pegels des abgestimmten Signalausgangs vom Abstimmkreis und Steuern des Dämpfungsgrades der Dämpfungsschaltung;
einer Pegeldämpfschaltung (12), die außerhalb einer Steuerschleife der automatischen Verstärkungsregelungs-Schaltung angeordnet ist, um das abgestimmte Signal, daß am Abstimmkreis ausgegeben ist, mit einem veränderbaren Dämpfungsgrad zu dämpfen, um ein pegelgedämpftes Signal auszugebe; und
einer Mischschaltung (5) zum Empfangen des pegelgedämpften Signalausgangs von der Pegeldämpfschaltung und Vermischen eines anderen Signals mit dem pegelgedämpften Signal, um ein Zwischenfrequenzsignal zu erhalten.

2. Schaltung nach Anspruch 1, wobei der Dämpfungsgrad der Pegeldämpfschaltung in Übereinstimmung mit dem ein- oder ausgeschalteten Zustand eines Schalters (10) geändert wird.

3. Schaltung nach Anspruch 1, wobei die Pegeldämpfschaltung (12) und die Mischschaltung (5) integral miteinander verbunden sind.

4. Schaltung nach Anspruch 3, wobei die Pegeldämpfschaltung (12) die Eingangssignalsströme steuert, die in die Mischschaltung (5) fließen.

5. Schaltung nach Anspruch 4, wobei die Pegeldämpfschaltung (12) ein paar Konstantstromschaltungen (Q_9,Q_{10},Q_{11},Q_{12},Q_{13},Q_{14}) aufweist, und die Ströme, welche in die Mischschaltung (5) fließen, durch Wählen einer der Konstantstromschaltungen schaltet.

Revendications

1. Circuit de commutation de sensibilité destiné à un récepteur radio comprenant :
un circuit amplificateur (3) destiné à amplifier un signal de radiofréquence afin de sortir un signal de radiofréquence amplifié,
un circuit d'amortissement (2) destiné à amortir le signal de radiofréquence avec une valeur d'amortissement variable avant que le signal de radiofréquence ne soit introduit dans le circuit amplificateur,
un circuit accordé (4) destiné à prélever un signal possédant une fréquence particulière à partir du signal de radiofréquence amplifié sorti du circuit amplificateur afin de sortir un signal accordé,
un circuit à contrôle automatique de gain (8, 9) destiné à détecter un niveau du signal accordé sorti du circuit accordé et pour contrôler la valeur d'amortissement du circuit d'amortissement,
un circuit amortisseur de niveau (12) disposé à l'extérieur d'une boucle de commande du circuit à contrôle automatique de gain, destiné à amortir le signal accordé sorti du circuit accordé avec une valeur d'amortissement variable afin de sortir un signal à niveau amorti, et
un circuit mélangeur (5) destiné à recevoir le signal à niveau amorti sorti du circuit amortisseur de niveau et destiné à mélanger un autre signal avec le signal à niveau amorti afin d'obtenir un signal de fréquence intermédiaire.

2. Circuit selon la revendication 1, dans lequel la valeur d'amortissement du circuit amortisseur de niveau est modifiée conformément à un état fermé et ouvert d'un commutateur (10).

3. Circuit selon la revendication 1, dans lequel le circuit amortisseur de niveau (12) et le circuit mélangeur (5) sont reliés intégralement l'un à l'autre.

4. Circuit selon la revendication 3, dans lequel le circuit amortisseur de niveau (12) commande les courants de signaux d'entrée circulant dans le circuit mélangeur (5).

5. Circuit selon la revendication 4, dans lequel le circuit amortisseur de niveau (12) comprend une paire de circuits à courant constant (Q9, Q10, Q11, 012, Q13, Q14) et commute les courants circulant dans le circuit mélangeur (5) en sélectionnant l'un des circuits à courant constant.