Description

The invention relates to a television receiver comprising, a video signal detector of a type which detects with the aid of a reference signal and an asynchronous detector, said video detector and said asynchronous detector being coupled to an output of an intermediate frequency path, an automatic gain control circuit coupled to respective outputs of each said detector and the asynchronous detector being made inoperative in the normal receiving mode.

The DE-AS 2,834,886 discloses a television receiver of the above mentioned type. Making the asynchronous detector inoperative in the normal receiving mode, when the video signal detector which detects with the aid of the reference signal provides the automatic gain control, is effected by keeping the normal amplitude of the intermediate frequency signal at the asynchronous detector sufficiently far below the threshold value of that asynchronous detector. The normal amplitude- threshold value ratio is then disadvantageous. A more advantageous ratio is not possible without entailing an unwanted operation of the asynchronous detector in the normal operating mode.

The invention has for its object to obviate this drawback.

According to the invention, a television receiver of the type described in the opening paragraph is characterized in that the asynchronous detector can be switched-off by means of a switch-off signal obtained from a receiving mode detector and occurring in a normal receiving mode, so that in the normal receiving mode the automatic gain control circuit cannot be driven by the asynchronous detector.

By the measure in accordance with the invention the threshold value of the asynchronous detector can be chosen to be very near to the value corresponding to the normal amplitude of the intermediate frequency signal in the normal receiving mode.

The invention will now be further described by way of example with reference to the accompanying drawing which comprises only one Figure showing a concise circuit diagram of a television receiver in accordance with the invention.

In the Figure, a received television signal is applied to an input 1 of a radio-frequency and mixer portion 3. This signal is converted, with the aid of an oscillator signal applied to an input 5 into an intermediate-frequency signal which is applied to an intermediate-frequency signal path 7.

From a balanced output 9 of the intermediate frequency signal path 7 the intermediate frequency signal is applied to a video signal detector 11, which is of a type which detects with the aid of a reference signal. As is known, this reference signal can be derived in several manners from the intermediate frequency signal. For the sake of clarity this is shown in the Figure only by means of a resonance circuit 12 and is not shown in detail.

From an output 13 of the video signal detector 11 a demodulated video signal is obtained which is applied to an input 15 of an automatic gain control circuit 17. Control signals which are applied to a control signal input 23 and 25 of the radio-frequency and mixer portion 3 and the intermediate-frequency signal path 7, respectively, are obtained from two outputs 19, 21 of the automatic gain control circuit 17.

The video signal at the output 13 of the video signal detector 11 is further applied to an input 27 of a synchronizing signal separating circuit 29 and to an input 31 of a picture display device 33. An output 35 of the synchronizing signal separating stage 29 applies a synchronizing signal to an input 37 of a coincidence circuit 39, which serves as a receiving mode detector, and to a synchronizing signal input 41 of a timebase circuit 43 of the picture display device 33. An output 45 of the timebase circuit 43 applies fly-back signals to an input 47 of the coincidence circuit 39, which applies a switching signal to an input 49 of a switch 51 upon the simultaneous occurrence of synchronizing signals and fly-back signals.

An input 53 of the switch 51 is connected to an output 55 of an asynchronous detector 57, a balanced input 59 of which is connected to the output 9 of the intermediate frequency signal path 7.

An output 61 of the switch 51 is connected to an input 63 of the automatic gain control circuit 17. In the asynchronous detector 57, the base-emitter junctions of two transistors 65, 67 are connected in anti-parallel to the input 59. The collectors of these transistors are connected to the output 55.

In the switch 51 the input 53 is connected to the cathodes of two diodes 69, 71. The anode of the diode 71 is connected to the output 61 of the switch 51 and the anode of the diode 69 to the emitter of a transistor 73 whose base is connected to the input 49 of the switch 51 and the collector to a positive voltage. If the voltage at the base of the transistor 73 is high then the diode 69 conducts if one of the transistors 65, 67 of the asynchronous detector 57 is conductive and the diode 71 remains in the non-conducting state. The voltage at the base of the transistor 73 is high when the coincidence circuit 39 detects a coincidence between the signal at its input 37 and 47. The television receiver is then in its normal operating mode and the asynchronous detector 57 is switched-off as the connection between the input 53 and the output 61 of the switch 51 is broken. If the voltage at the base of the transistor 73 is low then the receiver is in its abnormal operating mode and the diode 69 becomes non-conductive, and if the transistors 65 and 67 of the asynchronous detector 57 are conducting the diode 71 also conducts and consequently the

output 55 of the asynchronous detector 57 is connected to the input 63 of the automatic gain control circuit 17.

The transistors 65 and 67 of the asynchronous detector 57 conduct if their base-emitter voltage is sufficiently high, such as when the amplitude of the intermediate frequency signal at the output 9 of the intermediate frequency signal path 7 exceeds a threshold value which is determined by the properties of the transistors 65, 67.

In the automatic gain control circuit 17 the base of a transistor 75 whose emitter is connected to a current source 77 and to the emitter of a transistor 79 is connected to the input 15. The collector of the transistor 75 is connected to a positive voltage, the collector of the transistor 79 is connected to that positive voltage *via* a resistor 81 and the base of the transistor 79 is connected to a reference voltage V. The transistors 75 and 79 form a selection circuit 82 with which a level of the video signal applied to the input 15 is selected at which in the normal operating mode the automatic volume control of the television receiver is operative. This level determines in said normal operating mode the value of the direct voltage at a capacitor 83 which is connected to the collector of the transistor 79 and also to the input 63. As the connection between the input 63 and the output 55 of the asynchronous detector 57 is then broken, the asynchronous detector 57 can not influence the direct voltage at the capacitor 83. This direct voltage is applied to an input 85 of a threshold and amplifier circuit 87, whose outputs are connected to the outputs 19 and 21. Variations in the direct voltage at the capacitor 83 are counteracted by the resultant change of the gain of the radio-frequency and mixing portion 3 and/or the intermediate frequency signal path 7.

As was explained above, in the abnormal operating mode of the receiver, if, for example, no synchronizing signals occur at the input 37 of the coincidence circuit 39, the asynchronous detector 57 is connected to the capacitor 83 *via* the switch 51. The direct voltage at the capacitor can then be determined by the asynchronous detector 57. The absence of synchronizing signals at the input 37 of the coincidence circuit 39 can, as is known, be in certain cases the result of an overdrive of the video signal detector 11. So in those cases blocking of the automatic volume control is prevented from occurring by the operation of the asynchronous detector 57.

The automatic gain control circuit may be proportioned so that the direct voltage at the capacitor 83 is almost equal in the abnormal operating mode to the direct voltage in the normal operating mode, so that the threshold value of the asynchronous detector 57 need only differ little from the amplitude value of the intermediate-frequency signal at the input 59 thereof in the normal operating mode.

In the embodiment described, the switch 51 is arranged in series with the asynchronous detector 57. Although this results in a very simple circuit it is of course alternatively possible to switch the switch which is operable by the switching signal in a different manner.

If so desired, another suitable circuit may be used as the receiving mode detector instead of the coincidence circuit 39. A circuit which has been found to be also very suitable for use as a receiving mode detector is an overmodulation or whiter-than-white detector as described in the Netherlands Patent Application 7,613,946 (PHN 8621).

It will be obvious that an amplifier or buffer stage may additionally be incorporated between the output 9 of the intermediate-frequency signal path 7 and the input 39 of the asynchronous detector 57 and/or the video signal detector 11.

The current source 77 of the selection circuit 82 can operate in the keyed or the non-keyed mode, or may be switchable from keyed to non-keyed, for example as described in the German Auslegeschrift 1,963,465 (PHD 1436).

The video signal detector detecting with the aid of a reference signal may be of a synchronous or a quasi-synchronous type, in the latter case the reference signal can, as is known, be derived from the input signal in a simpler manner than in the first-mentioned case.

Claims

1. A television receiver comprising a video signal detector (11) of a type which detects with the aid of a reference signal and, an asynchronous detector (57), said video signal detector (11) and said asynchronous detector (57) being coupled to an output of an intermediate frequency path (7), an automatic gain control circuit (17) coupled to respective outputs of each said detector and the asynchronous detector (57) being made inoperative in the normal receiving mode, characterized in that the asynchronous detector (57) can be switched-off (51) by means of a switch-off signal (at 49) obtained from a receiving mode detector (39) and occurring in a normal receiving mode, so that in the normal receiving mode the automatic gain control circuit (17) cannot be driven by the asynchronous detector.

2. A television receiver as claimed in Claim 1, characterized in that a switch (51) which is operable by the switch-off signal is incorporated between the output (55) of the asynchronous detector (57) and the automatic gain control circuit (17).

3. A television receiver as claimed in Claim 1 or 2, characterized in that the switch-off signal is obtained from a coincidence circuit (39) which is controlled by a synchronizing signal and by an oscillator signal which is synchronized by this synchronizing signal.

4. A television receiver as claimed in Claim 1

output 55 of the asynchronous detector 57 is connected to the input 63 of the automatic gain control circuit 17.

The transistors 65 and 67 of the asynchronous detector 57 conduct if their base-emitter voltage is sufficiently high, such as when the amplitude of the intermediate frequency signal at the output 9 of the intermediate frequency signal path 7 exceeds a threshold value which is determined by the properties of the transistors 65, 67.

In the automatic gain control circuit 17 the base of a transistor 75 whose emitter is connected to a current source 77 and to the emitter of a transistor 79 is connected to the input 15. The collector of the transistor 75 is connected to a positive voltage, the collector of the transistor 79 is connected to that positive voltage *via* a resistor 81 and the base of the transistor 79 is connected to a reference voltage V. The transistors 75 and 79 form a selection circuit 82 with which a level of the video signal applied to the input 15 is selected at which in the normal operating mode the automatic volume control of the television receiver is operative. This level determines in said normal operating mode the value of the direct voltage at a capacitor 83 which is connected to the collector of the transistor 79 and also to the input 63. As the connection between the input 63 and the output 55 of the asynchronous detector 57 is then broken, the asynchronous detector 57 can not influence the direct voltage at the capacitor 83. This direct voltage is applied to an input 85 of a threshold and amplifier circuit 87, whose outputs are connected to the outputs 19 and 21. Variations in the direct voltage at the capacitor 83 are counteracted by the resultant change of the gain of the radio-frequency and mixing portion 3 and/or the intermediate frequency signal path 7.

As was explained above, in the abnormal operating mode of the receiver, if, for example, no synchronizing signals occur at the input 37 of the coincidence circuit 39, the asynchronous detector 57 is connected to the capacitor 83 *via* the switch 51. The direct voltage at the capacitor can then be determined by the asynchronous detector 57. The absence of synchronizing signals at the input 37 of the coincidence circuit 39 can, as is known, be in certain cases the result of an overdrive of the video signal detector 11. So in those cases blocking of the automatic volume control is prevented from occurring by the operation of the asynchronous detector 57.

The automatic gain control circuit may be proportioned so that the direct voltage at the capacitor 83 is almost equal in the abnormal operating mode to the direct voltage in the normal operating mode, so that the threshold value of the asynchronous detector 57 need only differ little from the amplitude value of the intermediate-frequency signal at the input 59 thereof in the normal operating mode.

In the embodiment described, the switch 51 is arranged in series with the asynchronous detector 57. Although this results in a very simple circuit it is of course alternatively possible to switch the switch which is operable by the switching signal in a different manner.

If so desired, another suitable circuit may be used as the receiving mode detector instead of the coincidence circuit 39. A circuit which has been found to be also very suitable for use as a receiving mode detector is an overmodulation or whiter-than-white detector as described in the Netherlands Patent Application 7,613,946 (PHN 8621).

It will be obvious that an amplifier or buffer stage may additionally be incorporated between the output 9 of the intermediate-frequency signal path 7 and the input 39 of the asynchronous detector 57 and/or the video signal detector 11.

The current source 77 of the selection circuit 82 can operate in the keyed or the non-keyed mode, or may be switchable from keyed to non-keyed, for example as described in the German Auslegeschrift 1,963,465 (PHD 1436).

The video signal detector detecting with the aid of a reference signal may be of a synchronous or a quasi-synchronous type, in the latter case the reference signal can, as is known, be derived from the input signal in a simpler manner than in the first-mentioned case.

Claims

1. A television receiver comprising a video signal detector (11) of a type which detects with the aid of a reference signal and, an asynchronous detector (57), said video signal detector (11) and said asynchronous detector (57) being coupled to an output of an intermediate frequency path (7), an automatic gain control circuit (17) coupled to respective outputs of each said detector and the asynchronous detector (57) being made inoperative in the normal receiving mode, characterized in that the asynchronous detector (57) can be switched-off (51) by means of a switch-off signal (at 49) obtained from a receiving mode detector (39) and occurring in a normal receiving mode, so that in the normal receiving mode the automatic gain control circuit (17) cannot be driven by the asynchronous detector.

2. A television receiver as claimed in Claim 1, characterized in that a switch (51) which is operable by the switch-off signal is incorporated between the output (55) of the asynchronous detector (57) and the automatic gain control circuit (17).

3. A television receiver as claimed in Claim 1 or 2, characterized in that the switch-off signal is obtained from a coincidence circuit (39) which is controlled by a synchronizing signal and by an oscillator signal which is synchronized by this synchronizing signal.

4. A television receiver as claimed in Claim 1

* C . M S *

or 2, characterized in that the switch-off signal is obtained from an overmodulation detector.

5. An integrated circuit for a television receiver as claimed in any of the preceding Claims, comprising a video signal detector (11) having an intermediate-frequency signal input, a selection circuit (82) connected to an output (13) of the video signal detector and an asynchronous detector (57) having an intermediate-frequency signal input (59), an output (55) of this asynchronous detector being coupled to an output (85) of the selection circuit (82) *via* a switch (51) having a switching signal input (49).

Revendications

1. Récepteur de télévision comprenant un détecteur de signal vidéo (11) d'un type qui détecte à l'aide d'un signal de référence et un détecteur asynchrone (57), le détecteur de signal vidéo (11) et le détecteur asynchrone (57) étant couplés à une sortie d'un trajet de fréquence intermédiaire (7), un circuit de réglage du gain automatique (17) couplé à des entrées correspondantes de chaque détecteur, le détecteur asynchrone (57) étant rendu inactif dans le mode de réception normal, caractérisé en ce que le détecteur asynchrone (57) peut être mis hors circuit (51) au moyen d'un signal de mise hors circuit (en 49) provenant d'un détecteur de mode de réception (39) et présent dans un mode de réception normal, de sorte que, dans le mode de réception normal, le circuit de réglage du gain automatique (17) ne peut pas être entraîné par le détecteur asynchrone.

2. Récepteur de télévision suivant la revendication 1, caractérisé en ce qu'un interrupteur (51), qui peut être actionné par le signal de mise hors circuit, est incorporé entre la sortie (55) du détecteur asynchrone (57) et le circuit de réglage du gain automatique (17).

3. Récepteur de télévision suivant la revendication 1 ou 2, caractérisé en ce que le signal de mise hors circuit provient d'un circuit à coïncidence (39) qui est commandé par un signal de synchronisation et par un signal oscillateur qui est synchronisé par ce signal de synchronisation.

4. Récepteur de télévision suivant la revendication 1 ou 2, caractérisé en ce que le signal de mise hors circuit provient d'un détecteur de surmodulation.

5. Circuit intégré pour un récepteur de télévision suivant l'une quelconque des revendications précédentes, qui comprend un détecteur de signal vidéo (11) comportant une entrée de signal de fréquence intermédiaire, un circuit de sélection (82) connecté à une sortie (13) du détecteur de signal vidéo et un détecteur asynchrone (57) comportant une entrée de signal de fréquence intermédiaire (59), une sortie (55) de ce détecteur asynchrone étant couplée à une sortie (85) du circuit de sélection (82) par l'intermédiaire d'un interrupteur (51) comportant une entrée de signal de commutation (49).

Patentansprüche

1. Fernsehempfänger mit einem Video-Signaldetektor (11) von einem mit Hilfe eines Bezugssignals detektierenden Typ und mit einem asynchronen Detektor (57), wobei der genannte Video-Signaldetektor (11) und der genannte asynchrone Detektor (57) mit einem Ausgang einer ZF-Strecke (7) gekoppelt sind, sowie mit einer automatischen Verstärkungsregelschaltung (17), die mit den betreffenden Ausgängen jedes genannten Detektors gekoppelt ist und wobei der asynchrone Detektor (57) in dem normalen Empfangszustand ausser Betrieb gesetzt wird, dadurch gekennzeichnet, dass der asynchrone Detektor (57) mittels eines von einem Empfangszustandsdetektor (39) erhaltenen, in einem normalen Empfangszustand auftretenden Ausschaltsignals (bei 49) ausschaltbar ist (51), so dass bei dem normalen Empfangszustand die automatische Verstärkungsregelschaltung (17) nicht von dem asynchronen Detektor gesteuert werden kann.

2. Fernsehempfänger nach Anspruch 1, dadurch gekennzeichnet, dass zwischen den Ausgang (55) des asynchronen Detektors (57) und die automatische Verstärkungsregelschaltung (17) ein durch das Ausschaltsignal betätigbarer Schalter (51) aufgenommen ist.

3. Fernsehempfänger nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass das Ausschaltsignal von einer Koinzidenzschaltung (39) erhalten wird, die durch ein Synchronsignal und durch ein von diesem Synchronsignal synchronisierten Oszillatorsignal gesteuert wird.

4. Fernsehempfänger nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass das Ausschaltsignal von einem Übermodulationsdetektor erhalten wird.

5. Integrierte Schaltungsanordnung für einen Fernsehempfänger nach einem der vorstehenden Ansprüche, die einen Video-Signaldetektor (11) mit einem ZF-Signaleingang, eine mit einem Ausgang (13) desselben gekoppelten Wahlschaltung (82) und einen asynchronen Detektor (57) mit einem ZF-Signaleingang (59) enthält, wobei ein Ausgang (55) dieses asynchronen Detektors über einen Schalter (51) mit einem Schaltsignaleingang (49), mit einem Ausgang (85) der Wahlschaltung (82) gekoppelt ist.

* C L M S *