

Description

The invention relates to a circuit arrangement for signal processing in a picture display device, comprising a line signal processing stage for processing a line signal for the horizontal deflection and an audio signal processing stage for processing an audio signal for sound reproduction, the line signal processing stage having a power supply input terminal connected to a first uni-directionally current-conducting element and the audio signal processing stage having a terminal which is connected to the first-mentioned terminal via a second uni-directionally current-conducting element, said elements being connected such that they cannot be conductive simultaneously.

Such a circuit arrangement is disclosed in the German Patent Application DE—A—2,220,170. In this prior art circuit a plurality of supply voltages is generated by the circuit for the horizontal deflection. One of these voltages is applied *via* the first uni-directionally current-conducting element to the power supply input terminal of the line signal processing stage and a supply voltage is directly applied by a mains rectifier to the terminal of the audio signal processing stage, whilst the second uni-directionally current conducting element which interconnects the two terminals is non-conducting. During a settling period after switch-on of the picture display device, the first element is, however, non-conducting whilst the second element conducts, in which period both said processing stages are supplied with supply energy by the mains rectifier.

It is an object of the invention to provide a circuit arrangement of the above-mentioned type in which the audio signal processing stage terminal has a dual function. According to the invention the circuit is characterized in that the circuit arrangement is incorporated in an integrated circuit having connecting terminals to which the power supply input terminal of the line processing stage and the audio signal processing stage terminal are internally coupled, the audio signal processing stage terminal being a supply terminal for the line signal processing stage when the second uni-directionally current-conducting element is conducting while the first uni-directionally current-conducting element is non-conducting and a volume level terminal for the audio signal processing stage when the first uni-directionally current-conducting element is conducting while the second uni-directionally current-conducting element is non-conducting, the audio signal processing stage having a supply terminal.

Because of the measure according to the invention the terminal considered has a function in both the line signal and the audio signal processing stages. These stages are very different stages for the processing of widely different signals which must definitely not influence each other. Thanks to these combined functions the number of terminals of the integrated circuit can

be reduced. The second terminal is not a supply terminal for the audio signal processing stage, which is possible because this stage is supplied with supply energy *via* a different terminal.

Advantageously the circuit is characterized in that the integrated circuit has a first connecting terminal which is internally connected to the audio signal processing stage supply terminal and *via* the first uni-directionally current-conducting element to the power supply input terminal of the line processing stage and externally to a supply voltage circuit, and also a second connecting terminal connected to the audio signal processing stage terminal. As a result thereof the first connecting terminal of the integrated circuit is a supply terminal for both said processing stages, whilst the second connecting terminal has the two above-mentioned functions.

If a supply voltage circuit comprises a mains rectifier, then the circuit is characterized in that the first connecting terminal is externally connected to the mains rectifier whilst the second connecting terminal is externally connected to a volume-setting device. If, in contrast therewith the supply voltage circuit forms part of an output stage coupled to an output of the line signal processing stage, then the circuit is characterized in that the second connecting terminal is externally connected to a switching stage which is controlled by the output stage and which connects the second connecting terminal to a current source which is derived from a mains voltage when the second uni-directionally current-conducting element conducts while the first uni-directionally current-conducting element does not conduct, the switching stage connecting the second connecting terminal to a volume-setting device when the first uni-directionally current-conducting element conducts while the second is not conducting.

A circuit in which the supply voltage circuit forms part of an output stage coupled to an output of the line signal processing stage and in which an output of the audio signal processing stage is coupled to an audio output stage which comprises a volume-setting device is characterized in that the second connecting terminal is externally connected to a current source which is derived from the mains voltage. In this case the circuit is preferably characterized in that the audio signal processing stage comprises an amplifier for amplifying the audio signal, this amplifier being set for its maximum gain.

The invention will now be further described by way of example with reference to the accompanying Figures. Herein:

Fig. 1 shows a first application of the circuit according to the invention,

Fig. 2 shows a second application of the circuit according to the invention,

Fig. 3 shows a third application of the circuit according to the invention,

Fig. 4 shows a detailed basic circuit diagram of a portion of the circuit according to the invention and

Fig. 5 shows a basic circuit diagram of a different portion of the circuit according to the invention.

In Fig. 1, reference numeral 1 denotes an integrated circuit which comprises several portions of a picture display device, for example a television receiver. One of these portions is a line signal processing stage 2 in which a line signal is processed in known manner for the horizontal deflection in a picture display tube, not shown. Circuit 1 also comprises an audio signal processing stage 3 in which an audio signal is processed in known manner for sound reproduction. An output signal of stage 2 is applied via a connecting terminal B to a line output stage 4 which is external of the circuit 1. Similarly, an output signal of stage 3 is applied via a connecting terminal D of circuit 1 to an audio output stage 5 which is external of the circuit 1.

A further connecting terminal A of circuit 1 is connected to a signal terminal E of stage 3. Arranged between terminal E and a supply terminal F of stage 2 is a diode D2, the anode of diode D2 being connected to terminals A and E and the cathode to terminal F. The anode of a diode D1 is connected to a connecting terminal C of circuit 1, whilst the cathode is connected to terminal F. Terminal C is also connected to a supply terminal G of stage 3 and also to the supply terminals of other portions, not shown, of the integrated circuit 1. A point of each of the different portions of circuit 1 is connected to a terminal H of circuit 1 which is connected to ground.

A switching stage 6 having a change-over switch whose master contact 7 is also connected to terminal A is provided externally of circuit 1. Under the control of a signal coming from line output stage 4, contact 7 can be connected either to a selector contact 8 or to a selector contact 9. Contact 8 is connected via a resistor 10 to the positive terminal of a d.c. voltage source whose negative terminal is connected to ground and whose voltage V_B of, for example, 300 V is derived from the electric mains supply by rectification. Contact 9 is connected to an adjustable resistor 11 whose other terminal is connected to ground.

On switch-on of the picture display device voltage V_B and the supply voltage for stage 4 are produced whilst no voltage is present yet at terminal C. Switching stage 6 is in the stage in which contacts 7 and 8 are interconnected. In these circumstances a current of approximately 6 mA flows to terminal F via resistor 10 and diode D2. Stage 2 comprises a line oscillator which starts oscillating with the result that a switching signal is applied to stage 4 via terminal B. In known manner stage 4 generates the line deflection current and also the high voltage for the final anode of the picture display tube. Stage 4 also generates supply voltages. One of these voltages is applied to terminal C as a supply voltage for the portions of circuit 1. After a settling period following switch-on, this voltage has a value which is sufficient for the operation of said portions, as a

result of which stages 2 and 3 are supplied with the signals intended for them. Stage 4 also generates the supply voltage for stage 5.

At the instant at which the voltage at terminal A becomes higher than the voltage at terminal C diode D1 becomes conductive, causing diode D2 to be cutoff. Terminals F and C are now interconnected and stage 2 is now fed by the voltage at terminal C. Stage 3 is also supplied with this voltage. In this final state switching stage 6 is now controlled by output stage 4 such that contacts 7 and 9 are interconnected. Stage 3 is arranged such that resistor 11 which is now connected to terminal E can provide the setting for the volume.

From the foregoing it will be apparent that during the settling period terminal A is connected to the supply terminal F of stage 2 for applying a supply current to this stage, in which period this current has no influence on stage 3. After the settling period terminals A and F are isolated from each other and terminal A is a volume level terminal for determining the amplitude of the audio signal applied to terminal D. The volume can be set in a known way other than with the aid of an adjustable resistor, for example with the aid of an adjustable voltage.

The construction shown in Fig. 1 holds for the case in which the supply voltage for stage 2 is generated by line output stage 4, which requires an external switching stage 6. Fig. 2 in which components which are the same as those in Fig. 1 have been given the same reference symbols, shows an embodiment in which the supply voltages for stage 2 and also for the other portions of circuit 1 and also for stages 4 and 5 are produced by a supply voltage circuit 12 connected to the mains supply. In Fig. 2 circuit 1 is identical to the circuit 1 of Fig. 1. Terminal A is connected to a volume setting device, for example resistor 11, whilst terminal C is connected to circuit 12. In Fig. 2 there are no settling phenomena and terminal A has for its sole function to set the volume. Here the voltage at this terminal is always lower than the voltage at terminal C so that diode D1 is continuously in the conducting state whilst diode D2 remains non-conducting.

The integrated circuit 1 of Figs. 1 and 2 can alternatively be connected as shown in Fig. 3. In Fig. 3 the supply voltages for stages 2, 3 and 5 are again generated by output stage 4. The difference with Fig. 1 is the fact that terminal A is connected to resistor 10 without the insertion of a switch, the other terminal of this resistor being connected to voltage V_B . During the settling period stage 2 is supplied with supply energy via terminal A and diode D2, whilst the voltage at terminal A does not influence stage 3. After the settling period the voltage at terminal C provides for the supply of voltage to the different portions of circuit 1. Stage 3 is arranged such that the amplitude of the audio signal present at terminal D has the maximum possible value whilst the setting of the volume is effected by means of a suitable arrangement. An adjustable potentiometer 13 can, for example, be connected between terminal D and ground, the

movable contact being connected to the input of stage 5. From the foregoing it will be apparent that in the case of Fig. 3 terminal A has no function other than to provide for the supply of stage 2 during the settling period. In both Fig. 1 and Fig. 3 resistor 10 functions as a current source for applying a starting current to stage 2.

Fig. 4 shows in detail a circuit diagram for the audio signal processing stage 3 of the preceding Figures. The series arrangement of three resistors 21, 22 and 23 is connected between terminal E, which is connected to terminal A, and ground via terminal H. The junction between resistors 21 and 22 is connected to the cathode of a diode 24, whose anode is connected to the emitter of npn-transistor 25. The base of transistor 25 is connected to the collector of an npn-transistor 26 and to the cathode of a zener diode 27, whose anode is connected to ground. The base of transistor 26 is connected to the bases of two further pnp-transistors 28 and 29, to the cathode of a diode 30 and to the collector of an npn-transistor 31, whose emitter is connected to the junction between resistors 22 and 23. The collector of transistor 25, the anode of diode 30 and the emitters of transistors 26, 28 and 29 are connected to terminal G. Terminal G is connected to terminal C. The collector of transistor 28 is connected to the base of transistor 31, to the emitter of a pnp-transistor 32 and to the emitter of an npn transistor 33, whilst the collector of transistor 29 is connected to a resistor 34 and to a resistor 35. The collector of transistor 32 and the other terminal of resistor 34 are connected to ground whilst the bases of transistors 32 and 33 are interconnected and connected to the junction between two resistors 36 and 37 which form a voltage divider between terminal G and ground. The collector of transistor 33 is connected to terminal G. Stage 3 also comprises an npn-transistor 38 whose collector is connected to the junction between resistors 22 and 23 via a resistor 39 and whose base is connected to that terminal of resistor 35 which is not connected to transistor 29, whilst the emitter is connected to ground. The series arrangement of two diodes 40 and 41 is connected between terminals A and F. These diodes conduct in the direction from A to F and have the function of diode D2 in Figs. 1, 2 and 3. In a similar way the series arrangement of two diodes 42 and 43 is connected between terminals G and F. These diodes conduct in the direction from C to F and have the function of diode D1 in Figs. 1, 2 and 3.

In addition, connected to terminal E is the base of a pnp transistor 44 whose collector is connected to ground, whereas the emitter is connected via a diode 45 having the same conductivity direction and a resistor 46 to a resistor 47 and to the base of an npn-transistor 48. The emitter of transistor 48 is connected to the emitter of a further npn-transistor 49 and to a current source 50. The collector of transistor 48 is connected to terminal D and to a resistor 51, whose other terminal is connected to terminal G. The collector of an npn-transistor 52 and the collector

of transistor 49 are also connected to terminal G. The emitter of transistor 52 is connected to a resistor 53, whose other end is connected to the base of the transistor 49, and to that terminal of transistor 47 which is not connected to transistor 48. A resistor 54 is arranged between the base of transistor 49 and ground and a resistor 55 is arranged between the base of transistor 52 and terminal G, whilst the series arrangement of a Zener diode 56 and a diode 57 is included between the base of transistor 52 and ground. In this situation the cathode of diode 56 is connected to the base of transistor 52 and the cathode of diode 57 is connected to ground. Finally, an audio signal source 58 is provided between source 50 and ground. Source 58 represents, for example, an audio demodulator which forms part of circuit 1.

Terminal A provides the starting function for stage 2 if a current is applied to this terminal. In that case a supply current flows to terminal F via diodes 40 and 41. A current flows also through resistors 21, 22 and 23 and causes such a voltage drop that transistor 44 is kept in the non-conducting stage. No voltage is present at terminal G, diodes 42 and 43 do not conduct and no audio signal is present at terminal D. The values of resistors 21, 22 and 23 and also the values of resistors 36 and 37 have been chosen such that when the voltage at terminal C increases transistor 31 is not capable of conduction as a result of which transistors 25, 26, 28 and 29 are also non-conducting. The emitter of transistor 52 becomes high. Since transistor 44 remains non-conducting, the base of transistor 48 carries a higher voltage than the base of transistor 49 which is non-conducting, and the gain of transistor 48 is at its maximum. In these circumstances an audio signal which has the maximum possible amplitude is present at terminal D. In the situation outlined here no change occurs after the voltage at terminal C has reached its final value. Thanks to diodes 42 and 43 the starting current has no influence on the stages which are supplied with supply voltage via terminal C.

Terminal A has the volume-setting function if an adjustable resistor is connected thereto, whilst the voltage at terminal C has a value located between, for example, 9.5 and 13.5 V. Because of the choice of the values of resistors 21, 22, 23, 36 and 37 transistor 31 conducts, as a result of which also transistors 25, 26, 28 and 29 conduct. Transistors 32 and 33 ensure that the voltage at the base of transistor 31 cannot fall below a predetermined value and cannot become higher than another predetermined value, which ensures that transistor 31 conducts without fail at any value of the adjustable resistor. Transistor 38 is used for the same purpose. By means of this transistor resistor 39 is connected in parallel with resistor 23, which decreases the voltage at the emitter of transistor 31. This voltage is proportional to the voltage at the junction point between resistors 21 and 22, which voltage is determined by zener diode 27. From the foregoing it will be obvious

that connecting the adjustable resistor results in a voltage being present at said junction, which has such a value that the gain of transistor 48 is adjustable and which, furthermore has the correct behaviour with changes in the temperature and/or in the supply voltage relative to corresponding changes in the voltage at the base of transistor 49. The temperature behaviour is further improved by means of diodes 24 and 45. The voltage at the base of transistor 44 and consequently the emitter current of this transistor are determined by the choice of the value of the adjustable resistor. This sets the gain of transistor 48. The adjustable resistor, resistor 11 in Figs. 1 and 2, consequently provides for the volume setting. The value thereof and also the values of resistors 21, 22 and 23 are chosen such that the voltage at the base of transistor 44 can be adjusted between 0 and 3V. It will be obvious that the adjustable resistor can be replaced by a voltage adjustable between 0 and 3 V.

Fig. 5 shows a possible embodiment of the switching stage of Fig. 1, which deviates somewhat from the principle of Fig. 1. Herein resistor 10 is arranged between the source producing voltage V_B and terminal A. The collector of an npn transistor 61 is connected to terminal A, the emitter to a resistor 62 and the base to a resistor 63 and to resistor 11. The other terminal of resistor 63 is connected to terminal C and to a suitable point of stage 4, whilst those terminals of resistors 62 and 11 which face away from transistor 61 are connected to ground. If no voltage is present at the said point of stage 4 then transistor 61 does not conduct and the starting current for stage 2 flows to terminal A via resistor 10. If the voltage at said point and consequently also at terminal C is indeed present then transistor 61 conducts, more specifically to an extent which depends on the value of resistor 11. This value is set such that the voltage at terminal A is adjusted between substantially 0 and 3 V.

It should be noted that the voltage at point A is high during the increase of the voltage at terminal C which has for its result that the gain of transistor 48 is then at its maximum whereafter the gain becomes adjustable. So as to prevent the reproduced sound from having briefly too high an intensity, it is recommendable that stage 5 does not immediately amplify the audio signal. This can be accomplished by causing the supply voltage for stage 5 to increase at a later instant than the voltage at terminal C. For this purpose a delay element, for example an RC-network can be provided in a simple way between terminal C and the supply terminal of stage 5 which ensures that stage 5 does not amplify until stage 6 has been switched.

It will be obvious that stage 6 may have a construction different from that of Fig. 5 and that stage 3 can be constructed in a way different from that shown in Fig. 4. Stage 3 may, for example, comprise a bistable element for controlling the voltage at the base of transistor 44 which bistable element is in a certain stage when a starting

current flows, whilst the other state prevails if terminal A has the volume-setting function. It will also be obvious that the manners in which stages 2, 4 and 5 and also circuit 12 are constructed are not important for the invention. The same applies for the number and nature of the portions which, apart from stages 2 and 3 are included in circuit 1: thus it is, for example, possible that stage 5 is partly or wholly part of the integrated circuit.

Claims

1. A circuit arrangement for signal processing in a picture display device, comprising a line signal processing stage for processing a line signal for the horizontal deflection and an audio signal processing stage for processing an audio signal for sound reproduction, the line signal processing stage having a power supply input terminal connected to a first uni-directionally current-conducting element and the audio signal processing stage having a terminal which is connected to the first-mentioned terminal via a second uni-directionally current-conducting element, said elements being connected such that they cannot be conductive simultaneously, characterized in that the circuit arrangement is incorporated in an integrated circuit (1) having connecting terminals to which the power supply input terminal (F) of the line processing stage (2) and the audio signal processing stage terminal (E) are internally coupled, the audio signal processing stage terminal being a supply terminal for the line signal processing stage when the second uni-directionally current-conducting element (D_2) is conducting while the first uni-directionally current-conducting element (D_1) is non-conducting and a volume level terminal for the audio signal processing stage when the first uni-directionally current-conducting element is conducting while the second uni-directionally current-conducting element is non-conducting, the audio signal processing stage (3) having a supply terminal (G).

2. A circuit arrangement as claimed in Claim 1, characterized in that the integrated circuit has a first connecting terminal (C) which is internally connected to the audio signal processing stage supply terminal (G) and via the first uni-directionally current-conducting element (D_1) to the power supply input terminal (F) of the line processing stage (2) and externally to a supply voltage circuit, and also a second connecting terminal (A) connected to the audio signal processing stage terminal.

3. A circuit arrangement as claimed in Claim 1, a supply voltage circuit comprising a mains rectifier, characterized in that the first connecting terminal (C) is externally connected to the mains rectifier (V_B) whilst the second connecting terminal (A) is externally connected to a volume-setting device (11).

4. A circuit arrangement as claimed in Claim 2, the supply voltage circuit forming part of an output stage which is coupled to an output of the line signal processing stage, characterized in that

that connecting the adjustable resistor results in a voltage being present at said junction, which has such a value that the gain of transistor 48 is adjustable and which, furthermore has the correct behaviour with changes in the temperature and/or in the supply voltage relative to corresponding changes in the voltage at the base of transistor 49. The temperature behaviour is further improved by means of diodes 24 and 45. The voltage at the base of transistor 44 and consequently the emitter current of this transistor are determined by the choice of the value of the adjustable resistor. This sets the gain of transistor 48. The adjustable resistor, resistor 11 in Figs. 1 and 2, consequently provides for the volume setting. The value thereof and also the values of resistors 21, 22 and 23 are chosen such that the voltage at the base of transistor 44 can be adjusted between 0 and 3V. It will be obvious that the adjustable resistor can be replaced by a voltage adjustable between 0 and 3 V.

Fig. 5 shows a possible embodiment of the switching stage of Fig. 1, which deviates somewhat from the principle of Fig. 1. Herein resistor 10 is arranged between the source producing voltage V_B and terminal A. The collector of an npn transistor 61 is connected to terminal A, the emitter to a resistor 62 and the base to a resistor 63 and to resistor 11. The other terminal of resistor 63 is connected to terminal C and to a suitable point of stage 4, whilst those terminals of resistors 62 and 11 which face away from transistor 61 are connected to ground. If no voltage is present at the said point of stage 4 then transistor 61 does not conduct and the starting current for stage 2 flows to terminal A via resistor 10. If the voltage at said point and consequently also at terminal C is indeed present then transistor 61 conducts, more specifically to an extent which depends on the value of resistor 11. This value is set such that the voltage at terminal A is adjusted between substantially 0 and 3 V.

It should be noted that the voltage at point A is high during the increase of the voltage at terminal C which has for its result that the gain of transistor 48 is, then at its maximum whereafter the gain becomes adjustable. So as to prevent the reproduced sound from having briefly too high an intensity, it is recommendable that stage 5 does not immediately amplify the audio signal. This can be accomplished by causing the supply voltage for stage 5 to increase at a later instant than the voltage at terminal C. For this purpose a delay element, for example an RC-network can be provided in a simple way between terminal C and the supply terminal of stage 5 which ensures that stage 5 does not amplify until stage 6 has been switched.

It will be obvious that stage 6 may have a construction different from that of Fig. 5 and that stage 3 can be constructed in a way different from that shown in Fig. 4. Stage 3 may, for example, comprise a bistable element for controlling the voltage at the base of transistor 44 which bistable element is in a certain stage when a starting

current flows, whilst the other state prevails if terminal A has the volume-setting function. It will also be obvious that the manners in which stages 2, 4 and 5 and also circuit 12 are constructed are not important for the invention. The same applies for the number and nature of the portions which, apart from stages 2 and 3 are included in circuit 1: thus it is, for example, possible that stage 5 is partly or wholly part of the integrated circuit.

Claims

1. A circuit arrangement for signal processing in a picture display device, comprising a line signal processing stage for processing a line signal for the horizontal deflection and an audio signal processing stage for processing an audio signal for sound reproduction, the line signal processing stage having a power supply input terminal connected to a first uni-directionally current-conducting element and the audio signal processing stage having a terminal which is connected to the first-mentioned terminal via a second uni-directionally current-conducting element, said elements being connected such that they cannot be conductive simultaneously, characterized in that the circuit arrangement is incorporated in an integrated circuit (1) having connecting terminals to which the power supply input terminal (F) of the line processing stage (2) and the audio signal processing stage terminal (E) are internally coupled, the audio signal processing stage terminal being a supply terminal for the line signal processing stage when the second uni-directionally current-conducting element (D_2) is conducting while the first uni-directionally current-conducting element (D_1) is non-conducting and a volume level terminal for the audio signal processing stage when the first uni-directionally current-conducting element is conducting while the second uni-directionally current-conducting element is non-conducting, the audio signal processing stage (3) having a supply terminal (G).

2. A circuit arrangement as claimed in Claim 1, characterized in that the integrated circuit has a first connecting terminal (C) which is internally connected to the audio signal processing stage supply terminal (G) and via the first uni-directionally current-conducting element (D_1) to the power supply input terminal (F) of the line processing stage (2) and externally to a supply voltage circuit, and also a second connecting terminal (A) connected to the audio signal processing stage terminal.

3. A circuit arrangement as claimed in Claim 1, a supply voltage circuit comprising a mains rectifier, characterized in that the first connecting terminal (C) is externally connected to the mains rectifier (V_B) whilst the second connecting terminal (A) is externally connected to a volume-setting device (11).

4. A circuit arrangement as claimed in Claim 2, the supply voltage circuit forming part of an output stage which is coupled to an output of the line signal processing stage, characterized in that



the second connecting terminal (A) is externally connected to a switching stage (6) which is controlled by the output stage (4) and which connects the second connecting terminal to a current source (V_B , 10) which is derived from a mains voltage when the second uni-directionally current-conducting element (D_2) conducts while the first unidirectionally current-conducting element (D_1) does not conduct, the switching stage connecting the second connecting terminal to a volume-setting device (11) when the first unidirectionally current-conducting element conducts while the second is non conducting.

5. A circuit arrangement as claimed in one of the Claims 3 and 4, characterized in that the audio signal processing stage (3) comprises a voltage source (25, 27) for generating a voltage at the terminal (E) thereof upon connection of the volume-setting device (11) to the second connecting terminal (A), the voltage source otherwise being inoperative, the generated voltage having such a value that the gain of an amplifier (48, 49) in the audio signal processing stage is adjustable.

6. A circuit arrangement as claimed in Claim 5, characterized in that the audio signal processing stage (3) further comprises a transistor (31) for making the voltage source operative upon connection to the second connecting terminal (A) of the volume-setting device (1) and for making the voltage source inoperative in the opposite case.

7. A circuit arrangement as claimed in Claim 2, the supply voltage circuit forming part of an output stage which is coupled to an output of the line signal processing stage and an output of the audio signal processing stage being coupled to an audio output stage comprising a volume-setting device, characterized in that the second connecting terminal (A) is externally connected to a current source which is derived from a mains voltage.

8. A circuit arrangement as claimed in Claim 7, characterized in that the audio signal processing stage comprises an amplifier (48, 49) for amplifying the audio signal, this amplifier being set for its maximum gain.

9. A circuit arrangement as claimed in Claim 4, an output of the audio signal processing stage being coupled to an audio output stage, characterized in that a delay element is connected between the first connecting terminal (C) and the supply terminal of the audio output stage (5).

Patentansprüche

1. Schaltungsanordnung zur Signalverarbeitung in einer Bildwiedergabeeinrichtung mit einer Horizontal-Signalverarbeitungsstufe zur Verarbeitung eines Horizontal-Signals zur Horizontal-Ablenkung und mit einer Tonsignalverarbeitungsstufe zur Verarbeitung eines Tonsignals zur Tonwiedergabe, wobei die Horizontal-Signalverarbeitungsstufe eine Speiseeingangsklemme aufweist, die mit einem ersten in nur einer Richtung stromleitenden Element verbunden ist und wobei die Tonsignalverarbeitungsstufe eine

Klemme aufweist, die über ein zweites in nur einer Richtung stromleitendes Element mit der erstgenannten Klemme verbunden ist, wobei diese Elemente derart verbunden sind, dass sie nicht gleichzeitig leitend sein können, dadurch gekennzeichnet, dass die Schaltungsanordnung in eine integrierte Schaltung (1) aufgenommen ist, die Anschlussklemmen aufweist, mit denen die Speiseeingangsklemme (F) der Horizontal-Signalverarbeitungsstufe (2) und die Tonsignalverarbeitungsstufenklemme (E) innerlich gekoppelt sind, wobei die Tonsignalverarbeitungsstufenklemme eine Speiseklemme für die Horizontal-Signalverarbeitungsstufe ist, wenn das zweite in nur einer Richtung stromleitende Element (D_2) leitend ist, während das erste in nur einer Richtung stromleitende Element (D_1) nicht leitend ist und eine Lautstärkenpegelklemme für die Tonsignalverarbeitungsstufe ist, wenn das erste in nur einer Richtung stromleitende Element leitend ist, während das zweite in nur einer Richtung stromleitende Element nicht leitend ist, wobei die Tonsignalverarbeitungsstufe (3) eine Speiseklemme (G) aufweist.

2. Schaltungsanordnung nach Anspruch 1, dadurch gekennzeichnet, dass die integrierte Schaltung eine erste Anschlussklemme (C) aufweist, die mit der Tonsignalverarbeitungsstufenspeiseklemme (G) und über das erste in nur einer Richtung stromleitende Element (D_1) mit der Speiseeingangsklemme (F) der Horizontal-Signalverarbeitungsstufe (2) innerlich und mit einer Speisespannungsschaltung äusserlich verbunden ist, sowie eine zweite Anschlussklemme (A), die mit der Tonsignalverarbeitungsstufenklemme verbunden ist.

3. Schaltungsanordnung nach Anspruch 1, wobei eine Speisespannungsschaltung einen Netzgleichrichter aufweist, dadurch gekennzeichnet, dass die erste Anschlussklemme (C) äusserlich mit dem Netzgleichrichter (V_B) verbunden ist, während die zweite Anschlussklemme (A) äusserlich mit einer Lautstärkeinstellanordnung (A) verbunden ist.

4. Schaltungsanordnung nach Anspruch 2, wobei die Speisespannungsschaltung einen Teil einer mit einem Ausgang der Horizontal-Signalverarbeitungsstufe gekoppelten Ausgangsstufe bildet, dadurch gekennzeichnet, dass die zweite Anschlussklemme (A) äusserlich mit einer durch die Ausgangsstufe (4) gesteuerten Schaltstufe (6) verbunden ist, die die zweite Anschlussklemme mit einer Stromquelle (V_B , 10) verbindet, die von einer Netzspannung abgeleitet wird, wenn das zweite in nur einer Richtung stromleitende Element (D_2) leitend ist, während das erste in nur einer Richtung stromleitende Element (D_1) nicht leitend ist, wobei die Schaltstufe die zweite Anschlussklemme mit einer Lautstärkeinstellanordnung (11) verbindet, wenn das erste in nur einer Richtung stromleitende Element leitend und das zweite nicht leitend ist.

5. Schaltungsanordnung nach einem der Ansprüche 3 und 4, dadurch gekennzeichnet, dass die Tonsignalverarbeitungsstufe (3) eine Span-



nungsquelle (25, 27) aufweist zum Erzeugen einer Spannung an der Klemme (E) derselben bei einer Verbindung der Lautstärkeeinstellanordnung (11) mit der zweiten Anschlussklemme (A), wobei die Spannungsquelle sonst nicht wirksam ist, wobei die erzeugte Spannung einen derartigen Wert aufweist, dass die Verstärkung eines Verstärkers (48, 49) in der Tonsignalverarbeitungsstufe einstellbar ist.

6. Schaltungsanordnung nach Anspruch 5, dadurch gekennzeichnet, dass die Tonsignalverarbeitungsstufe (3) weiterhin einen Transistor (31) aufweist, der bei Verbindung der zweiten Anschlussklemme (A) mit der Lautstärkeeinstellanordnung (11) die Spannungsquelle wirksam macht und der die Spannungsquelle im entgegengesetzten Fall unwirksam macht.

7. Schaltungsanordnung nach Anspruch 2, wobei die Speisespannungsschaltung einen Teil einer Ausgangsstufe bildet, die mit einem Ausgang der Horizontal-Signalverarbeitungsstufe gekoppelt ist und wobei ein Ausgang der Tonsignalverarbeitungsstufe mit einer Tonausgangsstufe mit einer Lautstärkeeinstellanordnung gekoppelt ist, dadurch gekennzeichnet, dass die zweite Anschlussklemme (A) äusserlich mit einer von einer Netzspannung abgeleiteten Stromquelle verbunden ist.

8. Schaltungsanordnung nach Anspruch 7, dadurch gekennzeichnet, dass die Tonsignalverarbeitungsstufe einen Verstärker (48, 49) zum Verstärken des Tonsignals aufweist, wobei dieser Verstärker auf die maximale Verstärkung eingestellt ist.

9. Schaltungsanordnung nach Anspruch 4, wobei ein Ausgang der Tonsignalverarbeitungsstufe mit einer Tonausgangsstufe gekoppelt ist, dadurch gekennzeichnet, dass zwischen der ersten Anschlussklemme (C) und der Speiseklemme der Tonausgangsstufe (5) ein Verzögerungselement vorgesehen ist.

Revendications

1. Circuit de traitement de signal dans un appareil de reproduction d'images, comportant un étage de traitement de signal de ligne pour traiter un signal de ligne pour la déviation horizontale et un étage de traitement de signal audio pour traiter un signal audio pour la reproduction sonore, l'étage de traitement de signal de ligne étant muni d'une borne d'entrée d'alimentation reliée à un premier élément conducteur de courant dans un seul sens, et l'étage de traitement de signal audio étant muni d'une borne reliée à la borne mentionnée en premier lieu à travers un second élément conducteur de courant dans un seul sens, lesdits éléments étant connectés de façon qu'ils ne puissent pas être simultanément conducteurs, caractérisé en ce que le circuit est incorporé à un circuit intégré (1) muni de bornes de raccordement auxquelles sont couplées intérieurement la borne d'entrée d'alimentation (F) de l'étage de traitement de ligne (2) et la borne (E) de l'étage de traitement de signal audio, la borne de

l'étage de traitement de signal audio servant de borne d'alimentation à l'étage de traitement de signal de ligne quand le second élément conducteur de courant dans un seul sens (D2) est conducteur tandis que le premier élément conducteur de courant dans un seul sens (D1) est bloqué, et servant de borne de niveau sonore à l'étage de traitement de signal audio quand le premier élément conducteur de courant dans un seul sens est conducteur tandis que le second élément conducteur de courant dans un seul sens est bloqué, l'étage de traitement de signal audio (3) étant muni d'une borne d'alimentation (G).

2. Circuit selon la revendication 1, caractérisé en ce que le circuit intégré est muni d'une première borne de raccordement (C) qui, intérieurement, est reliée à la borne d'alimentation (G) de l'étage de traitement de signal audio et, à travers le premier élément conducteur de courant dans un seul sens (D₁), à la borne d'entrée d'alimentation (F) de l'étage de traitement de ligne (2) et qui, extérieurement, est reliée à un circuit de tension d'alimentation, ainsi que d'une seconde borne de raccordement (A) reliée à la borne de l'étage de traitement de signal audio.

3. Circuit selon la revendication 1, un circuit de tension d'alimentation comportant un redresseur de secteur, caractérisé en ce que la première borne de raccordement (C) est reliée extérieurement au redresseur de secteur (V_B), tandis que la seconde borne de raccordement (A) est reliée extérieurement à un dispositif de réglage du volume sonore (11).

4. Circuit selon la revendication 2, le circuit de tension d'alimentation faisant partie d'un étage de sortie couplé à une sortie de l'étage de traitement de signal de ligne, caractérisé en ce que la seconde borne de raccordement (A) est reliée extérieurement à un étage de commutation (6) commandé par l'étage de sortie (4) et qui relie la seconde borne de raccordement à une source de courant (V_B, 10) déduite d'une tension de secteur lorsque le second élément conducteur de courant dans un seul sens (D₂) est conducteur tandis que le premier élément conducteur de courant dans un seul sens (D₁) est bloqué, l'étage de commutation reliant la seconde borne de raccordement à un dispositif (11) de réglage du volume sonore lorsque le premier élément conducteur de courant dans un seul sens est conducteur tandis que le second est bloqué.

5. Circuit selon l'une des revendications 3 et 4, caractérisé en ce que l'étage de traitement de signal audio (3) comporte une source de tension (25, 27) pour engendrer une tension à la borne (E) de celle-ci lors du raccordement du dispositif de réglage du volume sonore (11) à la seconde borne de raccordement (A), la source de tension étant inactive dans le cas contraire, alors que la tension engendrée a une valeur telle que le gain d'un amplificateur (48, 49) dans l'étage de traitement de signal audio est réglable.

6. Circuit selon la revendication (5), caractérisé en ce que l'étage de traitement de signal audio (3) comporte en outre un transistor (31) pour rendre



la source de tension active lors du raccordement de la seconde borne de raccordement (A) du dispositif de réglage du volume sonore (1) pour rendre la source de tension inactive dans le cas contraire.

7. Circuit selon la revendication 2, dans lequel le circuit de tension d'alimentation fait partie d'un étage de sortie couplé à une sortie de l'étage de traitement de signal de ligne et dans lequel une sortie de l'étage de traitement de signal audio est couplée à un étage de sortie audio comportant un dispositif de réglage du volume sonore, caractérisé en ce que la seconde borne de raccordement

(A) est reliée extérieurement à une source de courant déduite d'une tension de secteur.

8. Circuit selon la revendication 7, caractérisé en ce que l'étage de traitement de signal audio comporte un amplificateur (48, 49) pour amplifier le signal audio, cet amplificateur étant réglé à son gain maximal.

9. Circuit selon la revendication 4, une sortie de l'étage de traitement de signal audio étant couplé à un étage de sortie audio, caractérisé en ce qu'un élément à retard est intercalé entre la première borne de raccordement (C) et la borne d'alimentation de l'étage de sortie audio (5).

5

10

15

20

25

30

35

40

45

50

55

60

65

8

