Description

The present invention relates to the display of graphic information by an image reproducing device such as a kinescope and, in particular, to reducing current drawn by the image reproducing device during time periods when graphics are displayed for reducing image distortions.

In some television (TV) receivers, in particular those providing for remote-control operation by a viewer, an on-screen display of the status of an operating function, such as channel identification is a desirable feature. In one type of on-screen channel identification system described in U.S. Patent US—A—4,241,361 (Kamiya) entitled "Tuning Voltage Display Device For a Color Television Receiver with an Electronic Tuner", a vertical bar is produced on the face of the kinescope at a horizontal position which indicates the channel to which the TV receiver is tuned. As the TV tuning voltage is changed during the tuning process, the vertical bar is moved horizontally across the face of the kinescope so as to continuously provide an indication of the tuning process. TV receivers employing this type of channel indicator typically include a feature whereby the viewer may "recall" the channel indicating bar so that it is displayed on the screen of the kinescope along with the picture of the presently tuned channel so as to remind the viewer the indentification of the selected channel.

It has been observed that the vertical tuning bar sometimes appears to be bent, the effect being most severe when it is near the edges of the screen. The present inventors have recognised that the bending occurs when there are bright portions in the reproduced picture and the resulting high kinescope beam currents degrade the performance of the deflection circuits, which are associated with the kinescope in a manner which causes the bending. The bending is most severe at the edges of the screen because it is here that errors in the horizontal scanning rate are most noticeable.

Typically, TV receivers include an automatic beam current limiter, such as the type described in U.S. Patent US—A—4,167,025 (Willis) entitled "Automatic Peak Beam Current Limiter", for sensing excessive beam current (i.e. beam current which exceeds a preset threshold level) and deriving a control signal which is applied so as to reduce kinescope current conduction. Although automatic beam current limiters of this type may include both an average current and a peak current sensing circuit, they necessarily include preset threshold levels which must be exceeded before reduction in kinescope conduction occurs. Some TV receiver circuits, such as the deflection circuits, may be particularly sensitive to high levels of beam current and may therefore be adversely affected at beam current levels which do not exceed the preset levels. Increased horizontal scan width and the attendant bending of displayed vertical bars are visible examples of some of these adverse effects.

The preset levels for automatic beam current limiting of the kinescope are otpimized for normal video, i.e., such that video is generally reproduced at levels of beam current which are near but do not exceed the threshold levels. This is a subjective setting which will provide the brightest possible acceptable picture but, may occasionally cause bending of the vertical information towards the edges of the kinescope. Fortunately, the viewers attention is not steadily directed at the edges of the kinescope and any slight bending of vertical information would not be perceptible under most operating conditions.

However, when the viewer operates the "recall" feature of the channel indicator, the preset threshold levels of the automatic beam current limiter are no longer proper since the viewers attention is specifically directed at the vertical tuning bar displayed on the screen of the kinescope and brightness variations within the accompanying picture may result in undesired beinding of the tuning bar. This would be particularly upsetting to the viewer since the accuracy of the position of the vertical tuning bar is being relied upon the viewer for indicating the selected channel. Additionally, distortion of the tuning bar is esthetically displeasing and may lead the viewer to request an unnecessary service call.

According to the present invention, setout in claim 1, in a video signal reproducing system including an image reproducing device for displaying an image in response to video signals and also for displaying graphic information which may be superimposed on the image or substituted for a portion of the image, apparatus is provided for reducing maximum kinescope beam current conduction when graphics are displayed. More specifically, in response to a viewer operation which causes a display of graphic information, such as a vertical tuning bar, means are provided for lowering the threshold level of a beam current limiter from the level which was optimum for normal video.

The single Figure of the drawing shows, partially in block diagram form and partially in schematic diagram form, a general arrangement of a color television receiver employing apparatus constructed in accordance with the present invention.

The color television receiver shown in the Figure includes an antenna 2 for receiving VHF and UHF RF signals. A signal seeking tuner 4 selects RF signals corresponding to television channels in the receiving location and converts them to an IF signal. The IF signal is filtered, amplified and demodulated to provide a composite video signal at the output of IF amplifier and detector circuitry 6. The composite video signal contains luminance, chrominance, sound and synchronizing components.

A sync separator 8 serves to separate the synchronizing (sync) component including horizontal and vertical synchronization pulses from the composite video signal. The synchronization pulses are further processed by sync processing

and deflection circuitry 10 to provide horizontal and vertical deflection signals including horizontal flyback signals, and horizontal and vertical blanking signals.

A frequency selection stage 12 (e.g., a bandpass filter) couples the chrominance component of the composite video signal to chrominance signal processing stage 14 (e.g., including amplifier and demodulator stages) to derive R—Y, B—Y and G—Y color difference signals. These signals are applied to respective inputs of a kinescope driver stage 16.

The luminance component of the composite video signal is amplified and otherwise processed by a luminance signal processor 22 for supplying a luminance signal Y to a respective input of kinescope driver stage 16. There the luminance signal is combined with the color difference signals from chrominance stage 14 to form R, B and G color signals. These signals are then coupled to signal inputs (e.g., cathode electrodes) of a kinescope 24 for reproducing a color image of the received video signal. A contrast control stage 23 includes a potentiometer 25 for providing a variable DC voltage at its wiper which is applied to luminance processor 22 for changing the peak-to-peak signal level (contrast) of the luminance signal. The viewer may manually operate potentiometer 25 to adjust the contrast of the reproduced image.

Sound components of the IF signal are processed by a sound processor 18 to drive an audio signal which is reproduced by a loudspeaker 20.

The signal seeking and channel identification operation of the tuner will now be described in detail. The signal seeking operation is initiated when a user depresses a UP switch 26 or a DN (down) switch 28 which causes a ramp generator (not shown) of signal seeking tuner 4 to generate an increasing or decreasing, respectively, tuning voltage (V_t). As the tuning voltage varies, components of the IF and audio signals are examined by a carrier detector 30 to determine if a channel has been located. Detector 30, by way of example, may examine the condition of an automatic fine tuning voltage representing the frequency deviation of the picture carrier from its nominal value (e.g., 45.75 MHz in the United States) generated by IF section 6. Detector 30 may also be responsive to the synchronization components of the video signal generated by sync separator 8 for determining when a channel has been properly tuned. When a channel has been located, carrier detector 30 provides an inhibit signal to tuner 4 which stops the tuning voltage from further change.

Channel identification is provided by a tuning bar generator 32 which is responsive to the tuning voltage, VHF and UHF band indication signals, horizontal blanking pulses and a BAR ON signal (the generation of which will be described later). Generator 32 provides output signals to kinescope driver stage 16 which produces a vertical bar on the screen of kinescope 24 having an instantaneous horizontal position determined by the magnitude of the tuning voltage and a color dependent on the band indication signal. As the tuning voltage is increased or decreased to seek a channel, the bar moves to the left or right, respectively. When a channel has been located the bar stops its horizontal movement. The channel number of the channel that has been tuned can be determined by reference to channel numbers printed along the bottom of a mask (not shown) which surrounds kinescope 24.

Tuning bar generator 32 may include a ramp generator which is initiated by each horizontal blanking pulse and provides an output pulse of predetermined duration when the ramp voltage equals the tuning voltage. The duration of the output pulse establishes the width of the tuning bar. When a RECALL pushbutton 34 is depressed, the vertical tuning bar reappears, concurrently with the picture presently being viewed, for identifying the presently selected channel. Further details of the construction and operation of a signal seeking tuning system including vertical tuning bar channel identication apparatus suitable for use in the embodiment of the present invention, is described in U.S. Patent 4,366,502 (Shiu) entitled "Bar Type Channel Indentification Apparatus For a Television Receiver".

High operating voltages for focus (not shown) and ultor electrodes of kinescope 24 are provided by a high voltage supply 36 in response to positive, periodic horizontal flyback pulses occurring during horizontal retrace scanning interval. A current supply, including a source of positive direct voltage (+23 volts) and a current determining resistor 38, provides a supply current I_s and is coupled to a D.C. input of high voltage stage 36 via a resistor 40.

The current flowing in resistor 40 is representative of the beam current (i.e., ultor current) demand of the kinescope in response to the luminance and chrominance signals. This current is sometimes referred to as a "resupply" current (i.e., a current coupled via the high voltage stage of recharge or resupply the ultor electrode voltage of the kinescope when depleted as a result of beam current conduction) and is therefore labelled as I_r. The resupply current typically includes current pulses recurring at the horizontal line scanning rate. A capacitor 42 is connected to the junction of resistors 38 and 40 for filtering horizontal rate voltages which the horizontal rate current pulses tend to produce.

An automatic beam current limiter (ABL) 44 is connected to the junction of resistors 38 and 40 for sensing when the resupply current I_r exceeds a predetermined threshold level indicating the presence of excessive beam current demand. ABL stage 44 then develops an output control signal in accordance with the magnitude of the excessive beam current. This control signal is applied to luminance processor 22 in such a manner as to control the luminance signal to reduce excessive beam currents.

In the illustrated embodiment, this control signal is applied to the wiper of contrast control

potentiometer 23 for reducing the A.C. peak-to-peak level (contrast) of the luminance signal in proportion to the amount the resupply current exceeds the predetermined threshold level. An ABL stage and its coupling to the contrast control of the luminance signal processor in a manner for reducing excessive kinescope beam current is described in greater detail in U.S. Patent 4,126,884 (Shanley) entitled "Kinescope Beam Current Limiter Employing Automatic Sequential Control of Image Contrast And Brightness To Limit Beam Current". As indicated in this patent, the D.C. level (brightness) of the luminance signal may also be shifted in a direction to reduce excessive beam currents when the resupply current exceeds the predetermined threshold level.

During normal operating conditions of the ABL circuit 44, the input of ABL, at the junction between a diode 46 and a capacitor 47 connected in series between a source of supply voltage, shown as +11 V.D.C., and signal ground, is clamped to a potential of +11 volts plus the voltage drop across diode 46 (approximately +0.6 volts), or +11.6 volts.

Under these conditions, the value of resistor 38 and the voltage drop thereacross (+23 V.D.C.−11.6 V.D.C. or +11.4 V.D.C.) determine the normal level of supply current I_s (approximately 1.0 milliamperes). Supply current I_s divides between conductive diode 46 and the D.C. input of high voltage source 36 in accordance with the beam current demand of kinescope 24 as manifested by the level of resupply current I_r. As long as the beam current is not excessive, enough current is supplied to clamp diode 46 to keep it conductive and in response to the +11.6 V.D.C. developed at the input of ABL stage 44 the control signal output from ABL stage 44 is inhibited and the luminance signal is processed in normal fashion by luminance processor 22.

When the beam current becomes excessive there is insufficient supply current I_s to keep diode 46 conducting. Under these conditions the positive plate of capacitor 47 is no longer clamped by diode 46 to +11.6 Volts. D.C. and its voltage decreases to a less positive level at a rate determined by the amount by which the predetermined threshold current level, determined by supply current I_s, is exceeded. ABL stage 44 responds to this less positive voltage at its input by providing a corresponding output control signal which, as previously noted, controls the peak-to-peak level of the luminance signal in a direction to cause kinescope 24 to conduct proportionately less beam current.

As previously noted, the predetermined threshold level for beam current limiting is a subjective level determined for providing the brightest possible acceptable picture, but it may occasionally cause bending of vertical information displayed towards the edges of the face of the kinescope. When the viewer presses the RECALL button 34 to recall the vertical tuning bar in order to refresh his memory as to which channel is presently being viewed, the preset threshold level of the automatic beam current limiter may no longer be optimum since brightness variations within the reproduced picture may cause undesired bending of the vertical tuning bar. This is especially undesirable since the viewer's attention is specifically directed at the tuning bar. This undesired bending of the tuning bar is eliminated in accordance with the principles of the present invention, by automatically reducing the beam current limiter threshold level whenever vertical tuning bars (or in general, any graphics) are displayed on the face of the kinescope.

More specifically, tuner 4 includes logic circuitry (not shown) for providing a TUNING indication signal having a high logic level (+10 volts) when the tuner is seeking a channel. The logic circuit may comprise, for example, a flip-flop which is set in response to the closure of either one of the UP 26 or DN 28 pushbuttons for providing the high logic level signal and reset by the output of carrier detector 30 when the tuning operation is complete.

Connected to the TUNING signal output of the tuner 4 via an isolation diode 56, and also to the RECALL push button 34, is a low pass filter 50. Filter 50 which includes a resistor 52 and a capacitor 54 responds to the TUNING signal, or operation of the RECALL button, by generating the BAR ON signal at its output. The BAR ON signal is coupled to tuning bar generator 32 for enabling it to supply the output signals which are coupled to kinescope driver 16 for producing the vertical tuning bar display.

Between the junction of resistors 38 and 40 and signal ground is coupled the collector-emitter current path of a transistor 58 via a resistor 60. The BAR ON signal from filter 50 is coupled to the base electrode of transistor 58 via a further filter 62 including series connected resistors 64 and 66 and a shunt connected capacitor 68. In response to the high level of the BAR ON signal, transistor 58 is rendered conductive and diverts a portion (I_x) of the supply current I_s. Under these conditions diode 46 will become non-conductive (unclamped) at a lower level of resupply current I_r, than if transistor 58 were not conductive. Accordingly, beam currents which would have ordinarily distorted the vertical tuning bar will be inhibited.

Filter 62 delays the operation of transistor 58 when the BAR ON signal is initially generated and thereafter when it is terminated. The value of the components of filter 50 are chosen so that capacitor 54 charges relatively quickly to a voltage substantially greater than that necessary to enable bar generator 32 and transistor 58 is rendered conductive approximately 1/4 to 1/2 second after generator 32 enabled. When pushbutton 34 is no longer depressed or when the tuner is no longer signal seeking, diode 56 is reverse biased and a high impedance is presented at the input of filter 50.

Under these conditions capacitor 68 discharges relatively slowly via high impedance resistors 64 and 66 and the base-emitter junction of transistor

58 to ground. After about 4 seconds, capacitor 54 discharges to a level insufficient to keep generator 32 enabled and the tuning bar display is terminated. After about an additional 5 or 6 seconds, the base current to transistor 58 is insufficient to keep transistor 58 conductive. When transistor 58 ceases conduction, the predetermined threshold level of ABL stage 44 is returned to normal. The delayed turn-off of transistor 58 helps prevent viewer association of any picture contrast changes with the tuning bar display which might prompt a service call. This In general the turn-off delay is preferably at least twice as long as the turn on delay.

While the invention has been described in terms of a preferred embodiment, it should be recognized that various modifications can be made by persons skilled in the art without departing from the scope of the invention. For example, ABL stage 44 can cause reduced beam current by operating on either one or both of the contrast and brightness portions of the luminance signal. Further, in this respect, switching stage 58 can operate directly on the contrast or brightness controlling portions (as is illustrated by dashed line 70). However, in this case, the contrast or brightness will be reduced even if the beam current for a particular image is not excessive and may therefore produce a less than optimum image. Finally, component values and other examples of operating parameters mentioned in the specification are an aid to understanding the invention and are intended to be limiting.

Claims

1. In a system including a signal processing channel for processing video signals representative of conventional televised scenes and auxiliary signals representative of graphics and including an image reproducing device for reproducing conventional scenes in response to said processed video signals and graphics in response to said processed auxiliary signals, wherein current drawn by said image reproducing device is responsive to the amplitude characteristics of said processed video and auxiliary signals, apparatus for modifying said current drawn by said image reproducing device comprising:

modifying means (23) coupled to said signal processing channel for modifying the signal translation characteristics of said signal processing channel in a manner so as to reduce the level of said current drawn by said image reproducing device; and

control means (44), coupled to said signal translation characteristic modifying means and including detection means (46, 47) for detecting a flow of said image reproducing device current greater than a predetermined threshold level, for causing said modifying means to reduce said flow of said current; characterized by:

means (4) for generating a control signal whenever said graphics are to be reproduced; and threshold changing means (58) responsive to said control signal for reducing said threshold level when said graphics are to be reproduced;

said control means (44) being responsive to said reduced threshold level for controlling said signal translation characteristic modifying means to reduce the amplitude characteristics of said processed video signal whenever graphics are to be displayed.

2. The apparatus of Claim 1 characterized in that:

said reproducing means comprises a kinescope (24); and

said control means includes an automatic kinescope beam current limiter (44) responsive to the level of beam current drawn by said kinescope and coupled to said modifying means (23) for modifying the signal translation characteristics of said signal processing channel in accordance with the amount said kinescope beam current exceeds a predetermined threshold level.

3. The apparatus of Claim 1 or 2, characterized in that:

said modifying means includes contrast control means (23) for altering the peak-to-peak amplitude of said video signal.

4. The apparatus of any proceding Claim, characterized in that:

said control means includes filter means (62) coupled between said control signal generating means (4) and said modifying means (23) for delaying the response of said modifying means to said control signal.

5. The apparatus of Claim 4, characterized in that:

said filter means (62) provides a first delay at the generation of said control signal and a second delay at the end of said control signal.

6. The apparatus of Claim 5, characterized in that:

said second delay is at least twice as long as said first delay.

7. The apparatus of any preceding claim, characterized in that:

said threshold changing means includes a controllable conduction device (58) the conduction of which is changed whenever graphics are displayed.

8. Apparatus of any Claims 1—6, characterized in that:

said system is arranged in a television receiver including a signal seeking tuner responsive to the magnitude of a tuning signal for tuning RF carriers to produce an IF signal, said signal processing channel is responsive to said IF signal for generating at least one video signal, tuning identification apparatus including a bar generator (32) coupled to said signal processing channel for producing a vertical tuning bar on the face of said image reproducing device having a horizontal position determined by the magnitude of said tuning voltage, said control means (44) limits current drawn by said image reproducing device above an established current threshold level, and

58 to ground. After about 4 seconds, capacitor 54 discharges to a level insufficient to keep generator 32 enabled and the tuning bar display is terminated. After about an additional 5 or 6 seconds, the base current to transistor 58 is insufficient to keep transistor 58 conductive. When transistor 58 ceases conduction, the predetermined threshold level of ABL stage 44 is returned to normal. The delayed turn-off of transistor 58 helps prevent viewer association of any picture contrast changes with the tuning bar display which might prompt a service call. This In general the turn-off delay is preferably at least twice as long as the turn on delay.

While the invention has been described in terms of a preferred embodiment, it should be recognized that various modifications can be made by persons skilled in the art without departing from the scope of the invention. For example, ABL stage 44 can cause reduced beam current by operating on either one or both of the contrast and brightness portions of the luminance signal. Further, in this respect, switching stage 58 can operate directly on the contrast or brightness controlling portions (as is illustrated by dashed line 70). However, in this case, the contrast or brightness will be reduced even if the beam current for a particular image is not excessive and may therefore produce a less than optimum image. Finally, component values and other examples of operating parameters mentioned in the specification are an aid to understanding the invention and are intended to be limiting.

Claims

1. In a system including a signal processing channel for processing video signals representative of conventional televised scenes and auxiliary signals representative of graphics and including an image reproducing device for reproducing conventional scenes in response to said processed video signals and graphics in response to said processed auxiliary signals, wherein current drawn by said image reproducing device is responsive to the amplitude characteristics of said processed video and auxiliary signals, apparatus for modifying said current drawn by said image reproducing device comprising:

modifying means (23) coupled to said signal processing channel for modifying the signal translation characteristics of said signal processing channel in a manner so as to reduce the level of said current drawn by said image reproducing device; and

control means (44), coupled to said signal translation characteristic modifying means and including detection means (46, 47) for detecting a flow of said image reproducing device current greater than a predetermined threshold level, for causing said modifying means to reduce said flow of said current; characterized by:

means (4) for generating a control signal whenever said graphics are to be reproduced; and threshold changing means (58) responsive to said control signal for reducing said threshold level when said graphics are to be reproduced;

said control means (44) being responsive to said reduced threshold level for controlling said signal translation characteristic modifying means to reduce the amplitude characteristics of said processed video signal whenever graphics are to be displayed.

2. The apparatus of Claim 1 characterized in that:

said reproducing means comprises a kinescope (24); and

said control means includes an automatic kinescope beam current limiter (44) responsive to the level of beam current drawn by said kinescope and coupled to said modifying means (23) for modifying the signal translation characteristics of said signal processing channel in accordance with the amount said kinescope beam current exceeds a predetermined threshold level.

3. The apparatus of Claim 1 or 2, characterized in that:

said modifying means includes contrast control means (23) for altering the peak-to-peak amplitude of said video signal.

4. The apparatus of any proceding Claim, characterized in that:

said control means includes filter means (62) coupled between said control signal generating means (4) and said modifying means (23) for delaying the response of said modifying means to said control signal.

5. The apparatus of Claim 4, characterized in that:

said filter means (62) provides a first delay at the generation of said control signal and a second delay at the end of said control signal.

6. The apparatus of Claim 5, characterized in that:

said second delay is at least twice as long as said first delay.

7. The apparatus of any preceding claim, characterized in that:

said threshold changing means includes a controllable conduction device (58) the conduction of which is changed whenever graphics are displayed.

8. Apparatus of any Claims 1—6, characterized in that:

said system is arranged in a television receiver including a signal seeking tuner responsive to the magnitude of a tuning signal for tuning RF carriers to produce an IF signal, said signal processing channel is responsive to said IF signal for generating at least one video signal, tuning identification apparatus including a bar generator (32) coupled to said signal processing channel for producing a vertical tuning bar on the face of said image reproducing device having a horizontal position determined by the magnitude of said tuning voltage, said control means (44) limits current drawn by said image reproducing device above an established current threshold level, and

is coupled to said tuning identification apparatus for reducing said established threshold level whenever said vertical tuning bar is displayed.

9. Apparatus of any of Claims 1—6 or Claim 8, characterized in that:

said modifying means (23) is responsive to said current drawn by said image reproducing device for modifying the signal translation characteristics of said signal processing channel in a manner so as to reduce the level of said current drawn by said image reproducing device whenever said drawn current exceeds a predetermined threshold level, and said control means (44) is responsive to said control signal for providing an output signal to said modifying means for reducing said predetermined threshold level whenever said auxiliary signal is to be reproduced.

10. The apparatus of Claim 8 or 9, characterized in that:

said control means includes a controlled conduction device (58), the conduction of which is changed in response to the display of graphics.

11. The apparatus of Claim 10, characterized in that:

said modifying means (23) includes contrast control means for altering the peak-to-peak amplitude of said video signal, said contrast control means reducing said amplitude whenever graphics are displayed.

12. The apparatus of Claim 11, characterized in that:

said graphics are displayed on said image display device concurrently with at least a portion of said conventional televised scene.

Patentansprüche

1. Anordnung in einem System, das einen signalverarbeitenden Kanal enthält zum Verarbeiten von Videosignalen, die übliche, durch Fernsehen übertragene Szenen darstellen, und von Zusatzsignalen, die Graphiken darstellen, und das eine Bildwiedergabeeinrichtung enthält für die Wiedergabe üblicher Szenen in Reaktion auf die verarbeiteteten Videosignale und zur Widergabe von Graphiken in Reaktion auf die verarbeiteten Zusatzsignale, wobei der von der Bildwiedergabeeinrichtung gezogene Strom auf die Amplitudencharakteristiken der verarbeiteten Video- und Zusatzsignale reagiert,

zur Modifizierung des von der Bildwiderabeeinrichtung gezogenen Stroms,

mit einer Modifizierungseinrichtung (23), die mit dem signalverarbeitenden Kanal gekopp. . ist, um die Signalübertragungscharakteristiken des signalverarbeitenden Kanals in einer solchen Weise zu modifizieren, daß der Pegel des von der Bildwiedergabeeinrichtung gezogenen Stroms vermindert wird,

und mit einer Steuereinrichtung (44), die mit der die Signalübertragungscharakteristik modifizierenden Einrichtung gekoppelt ist und eine Erfassungseinrichtung (46, 47) enthält zum Erfassen eines einen vorbestimmten Schwellenwert übersteigenden Flusses des Stroms der Bildwiedergabeeinrichtung, um die Modifizierungseinrichtung zur Verminderung dieses Stromflusses zu veranlassen, gekennzeichnet durch:

eine Einrichtung (4) zur Erzeugung eines Steuersignals immer dann, wenn die Graphiken wiedergegeben werden sollen,

und eine Schwellenänderungseinrichtung (58), die auf das Steuersignal anspricht, um den Schwellenwert zu vermindern, wenn die Graphiken wiedergegeben werden sollen;

wobei die Steuereinrichtung (44) auf den verminderten Schwellenwert anspricht, um die Signalübertragungscharakteristik-Modifizierungseinrichtung immer dann, wenn Graphiken wiedergegeben werden sollen, zur Verminderung der Amplitudencharakteristiken des verarbeiteten Videosignals zu veranlassen.

2. Anordnung nach Anspruch 1, dadurch gekennzeichnet, daß die Wiedergabeeinrichtung eine Bildröhre (24) aufweist und

daß die Steuereinrichtung einen automatischen Bildröhren-Strahlstrombegrenzer (44) enthält, der auf den Pegel des von der Bildröhre gezogenen Strahlstroms anspricht und mit der Modifizierungseinrichtung (23) gekoppelt ist, um die Signalübertragungscharakteristiken des signalverarbeitenden Kanals entsprechend demjenigen Maß zu modifizieren, um welches der Bildröhren-Strahlstrom einen vorbestimmten Schwellenwert übersteigt.

3. Anordnung nach Anspruch 1 oder 2, dadurch gekennzeichnet,

daß die Modifizierungseinrichtung eine Kontraststeuereinrichtung (23) enthält, um die Spitze-Spitze-Amplitude des Videosignals zu ändern.

4. Anordnung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet,

daß die Steuereinrichtung eine Filtereinrichtung (62) enthält, die zwischen die Steuersignal-Erzeugungseinrichtung (4) und die Modifizierungseinrichtung (23) gekoppelt ist, um die Antwort der Modifizierungseinrichtung auf das Steuersignal zu verzögern.

5. Anordnung nach Anspruch 4, dadurch gekennzeichnet, daß die Filtereinrichtung (62) eine erste Verzögerung bei der Erzeugung des Steuersignals und eine zweite Verzögerung am Ende des Steuersignal bewirkt.

6. Anordnung nach Anspruch 5, dadurch gekennzeichnet,

daß die zweite Verzögerung mindestens doppelt so lang wie die erste Verzögerung ist.

7. Anordnung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet,

daß die Schwellenänderungseinrichtung ein Bauelement (58) steuerbarer Leitfähigkeit enthält, dessen Leitfähigkeit immer dann geändert wird, wenn Graphiken wiedergegeben werden.

8. Anordnung nach einem der Ansprüche 1 bis 6, dadurch gekennzeichnet,

daß das System in einem Fernsehempfänger angeordnet ist, der einen auf den Betrag eines Abstimmsignals ansprechenden signalsuchen-

den Tuner enthält, um eine Abstimmung auf HF-Träger für die Erzeugung eines ZF-Signals herbeizuführen;

daß der signalverarbeitende Kanal auf das ZF-Signal anspricht, um mindestens ein Videosignal zu erzeugen;

daß eine Abstimm-Identifizierungseinrichtung vorgesehen ist, die einen mit dem signalverarbeitenden Kanal gekoppelten Balkengenerator (32) enthält, um auf der Schirmfläche der Bildwiedergabeeinrichtung einen vertikalen Abstimmbalken zu erzeugen, dessen horizontale Position durch den Betrag der Abstimmspannung bestimmt ist;

daß die Steuereinrichtung (44) den von der Bildwiedergabeeinrichtung gezogenen Strom oberhalb eines eingestellten Stromschwellenpegels begrenzt und mit der Abstimm-Identifizierungseinrichtung gekoppelt ist, um den eingestellten Schwellenpegel immer dann zu vermindern, wenn der vertikale Abstimmbalken wiedergegeben wird.

9. Anordnung nach einem der Ansprüche 1 bis 6 oder nach Anspruch 8, dadurch gekennzeichnet,

daß die Modifizierungseinrichtung (23) auf den von der Bildwiedergabeeinrichtung gezogenen Strom anspricht, um die Signalübertragungscharakteristiken des signalverarbeitenden Kanals in einer solchen Weise zu modifizieren, daß der Pegel des von der Bildwiedergabeeinrichtung gezogenen Stroms immer dann vermindert wird, wenn der gezogene Strom einen vorbestimmten Schwellenwert übersteigt;

daß die Steuereinrichtung (44) auf das Steuersignal anspricht, um an die Modifizierungseinrichtung ein Ausgangssignal zur Reduzierung des vorbestimmten Schwellenpegels immer dann zu liefern, wenn das Zusatzsignal wiedergegeben werden soll.

10. Anordnung nach Anspruch 8 oder 9, dadurch gekennzeichnet,

daß die Steuereinrichtung ein Bauelement (58) steuerbarer Leitfähigkeit enthält, dessen Leitfähigkeit in Reaktion auf die Wiedergabe von Graphiken geändert wird.

11. Anordnung nach Anspruch 10, dadurch gekennzeichnet,

daß die Modifizierungseinrichtung (23) eine Kontraststeuereinrichtung zur Änderung der Spitze-Spitze-Amplitude des Videosignals enthält und daß diese Kontraststeuereinrichtung die Amplitude immer dann vermindert, wenn Graphiken wiedergegeben werden.

12. Anordnung nach Anspruch 11, dadurch gekennzeichnet,

daß die Graphiken auf der Bildwiedergabeeinrichtung gleichzeitig mit mindestens einem Teil der üblichen, durch Fernsehen übertragenen Szene wiedergegeben werden.

Revendications

1. Dans un système comprenant un canal de traitement de signaux pour traiter des signaux vidéo représentatifs de scènes télévisées conventionnelles et des signaux auxiliaires représentatifs de graphiques et comprenant un dispositif de reproduction d'image pour reproduire des scènes conventionnelles en réponse aux signaux vidéo traités et des graphiques en réponse aux signaux auxiliaires traités, où du courant soutiré par le dispositif de reproduction d'image est sensible aux caractéristiques d'amplitude des signaux vidéo et auxiliaires traités, dispositif pour modifier le courant soutiré par le dispositif de reproduction d'image comprenant:

un moyen de modification (23) couplé au canal de traitement de signaux pour modifier les caractéristiques de translation des signaux du canal de traitement de signaux, d'une manière afin de réduire le niveau de courant soutiré par le dispositif de reproduction d'image; et

un moyen de commande (44), couplé au moyen de modification de caractéristiques de translation de signaux et comprenant un moyen de détection (46, 47) pour détecter une circulation du courant du dispositif de reproduction d'image supérieur à un niveau de seuil prédéterminé, pour amener le moyen de modification à réduire la circulation du courant; caractérisé par:

un moyen (4) pour produire un signal de commande chaque fois que des graphiques doivent être reproduits; et un moyen de changement de seuil (58) répondant au signal de commande pour réduire le niveau de seuil lorsque les graphiques doivent être produits;

le moyen de commande (44) répondant au niveau de seuil réduit pour comannder le moyen de modification de caractéristiques de translation de signaux pour réduire les caractéristiques d'amplitude du signal vidéo traité chaque fois que des graphiques doivent être visualisés.

2. Dispositif selon la revendication 1, caractérisé en ce que:

le moyen de reproduction précité comprend un tube-image (24); et

le moyen de commande précité comprend un limiteur du courant du faisceau automatique du tube-image (44) répondant au niveau du courant du faisceau soutiré par le tube-image et couplé au moyen de modification précité (23) pour modifier les caractéristiques de translation des signaux du canal de traitement de siganux précités selon la quantité de courant de faisceau du tube-image qui dépasse un niveau de seuil prédéterminé.

3. Dispositif selon la revendication 1 ou 2, caractérisé en ce que:

le moyen de modification précité comprend un moyen de commande de contraste (23) pour modifier l'amplitude crête-crête signal vidéo précité.

4. Dispositif selon l'une des revendications précédentes, caractérisé en ce que:

le moyen de commande précité comprend un moyen filtre (62) couplé entre le moyen de production précité du signal de commande (4) et le

moyen de modification précité (23) pour retarder la réponse du moyen de modification au signal de commande.

5. Dispositif selon la revendication 4, caractérisé en ce que:

le moyen filtre précité (62) produit un premier retard à la production du signal de commade précité et un second retard à la fin du signal de commande.

6. Dispositif selon la revendication 5, caractérisé en ce que:

le second retard précité est d'au moins deux fois l durée du premier retard.

7. Dispositif selon l'une des revendications précédentes, caractérisé en ce que:

le moyen de changement de seuil précité comprend un dispositif de conduction contrôlable (58) dont la conduction est changée chaque fois que des graphiques sont visualisés.

8. Dispositif selon l'une des revendications 1 à 6, caractérisé en ce que:

le système précité est agencé dans un récepteur de télévision comprenant un tuner de recherche des signaux répondant à la grandeur d'un signal d'accord pour accorder des porteuses haute fréquence pour produire un signal de fréquence intermédiaire, le canal de traitement de signaux précité répond au signal de fréquence intermédiaire pour produire au moins un signal vidéo, le dispositif d'identification d'accord comprenant un générateur de barre (32) couplé au canal de traitement de signaux pour produire une barre d'accord verticale sur la face du dispositif de reproduction d'image ayant une position horizontale déterminée par la grandeur de la tension d'accord précitée, le moyen de commande précité (44) limite le courant soutiré par le dispositif de reproduction d'image au-dessus d'un niveau de seuil de courant établi, et est couplé au dispositif d'identification d'accord pour réduire le niveau de seuil établi chaque fois que la barre d'accord verticale est visualisée.

9. Dispositif selon l'une des revendications 1 à 6, ou la revendication 8, caractérisé en ce que:

le moyen de modification précité (23) répond au courant précité soutiré par le dispositif de reproduction d'image précité pour modifier les caractéristiques de translation des signaux du canal de traitement des signaux d'une manière afin de réduire le niveau du courant soutiré par le dispositif de reproduction d'image chaque fois que le courant soutiré excède un niveau de seuil prédéterminé, et le moyen de commande précité (44) répond au signal de commande pour produire un signal de sortie au moyen de modification pour réduire le niveau de seuil prédéterminé chaque fois que le signal auxiliaire doit être reproduit.

10. Dispositif selon la revendication 8 ou 9, caractérisé en ce que:

le moyen de commnade précité comprend un dispositif de conduction contrôlé (58), dont la conduction est changée en réponse à la visualisation de graphiques.

11. Dispositif selon la revendication 10, caractérisé en ce que;

le moyen de modification précité (23) comprend un moyen de contrôle du contraste pour modifier l'amplitude crête-crête du signal vidéo précité, le moyen de commande de contraste réduisant l'amplitude chaque fois que des graphiques sont visualisés.

12. Dispositif selon la revendication 11, caractérisée en ce que:

les graphiques précités sont visualisés sur le dispositif de visualisation d'image concurremment avec au moins une partie de la scène télévisée conventionnelle précitée.