Description

The invention relates to an apparatus for reading a disc-shaped record carrier in which video signals are recorded in substantially spiral tracks in such a way that corresponding picture elements of consecutive video pictures are situated at substantially the same circumferential position on said record carrier, an address code being contained in at least one of the two fields of the video signal representing a video picture at a predetermined position in the field blanking interval after the field-synchronizing pulse, which apparatus comprises:

an optical system for aiming a light beam at the record carrier, said light beam being modulated by the record carrier, and for converting said modulated light beam into an electric signal,

a converter for converting said electric signal into a radial tracking-error signal which corresponds to the radial position of the landing spot of the light beam relative to a desired track,

positioning means for controlling the position of the landing spot of the light beam as a function of the radial tracking-error signal,

a jump-signal generator for generating a control signal for causing the landing spot of the light beam to be shifted over a predetermined distance in response to a jump signal, and

means for applying said control signal to the positioning means during said jump.

Such apparatus is *inter alia* the video-disc player which is commercially available from N. V. Philips' Gloeilampenfabrieken under the designation "Laservision" and which is described *inter alia* in the magazine "Philips Technical Review", Vol. 33, 1973, No. 7, pages 177—193 and United States Patent Specification No. RE 29,963. In this known apparatus a jump of one or a few tracks is made in order to obtain still picture, slow motion etc. In said apparatus a predetermined signal is applied *via* the field synchronizing pulse during the field-blanking interval in order to obtain a jump of the positioning means over a specific distance.

For some use, such as in interactive video disc players which cooperate with a game computer, it is desirable to have the possibility of changing the scene being reproduced, for which purpose the landing spot of the laser beam must be changed very rapidly over a large number of tracks in a radial direction by the positioning means, for example a pivotal mirror, though it is also possible to use other actuators such as linearly moving actuators. In particular because in such a case a plurality of scenes may have been recorded in parallel and may change from track to track, it is essential that such a jump in a radial direction ends at the desired track, because otherwise a scene other than the desired scene is reached. In order to be able to ascertain immediately whether a jump is correct, it is therefore necessary that the address code can be read after the jump and that consequently the jump is always terminated before said address code is read.

It is the object of the invention to provide an apparatus of the type specified in the opening paragraph by means of which said jumps can be effected in such a manner that they always terminate before said address code and in such a manner that the disturbance of the picture is minimal.

To this end the invention is characterized by

means for generating a first signal which is a continuous measure of the duration of the period of time up to a reference point in the next field blanking interval, which point precedes the address code in said field blanking interval,

means for generating a second signal under command of the jump signal, which second signal is a measure of the anticipated duration of the jump to be performed in response to said command, and

means for continuously comparing said first and said second signal and, in relation to the instant at which the two durations correspond, generating a start signal for the jump-signal generator at least if said instant appears prior to the field-synchronizing pulse preceding said address code.

The steps in accordance with the invention ensure that the jumps always terminate prior to the read-out of the address code. Maximum jumps longer than the field blanking interval are permissible without the picture being disturbed significantly because the video signal of the preceding field is disturbed only and not to more than the necessary extent if the jumps are longer than the field blanking intervals, said disturbance then appearing in the lower lines of the picture in only one field during a change of scene.

With respect to the means for generating the first signal the apparatus may further be characterized in that said means for generating the first signal comprise counting means which are started each time that an address code appears.

The invention will now be described in more detail, by way of example, with reference to the drawings in which:

Fig. 1 shows an apparatus in accordance with the invention,

Fig. 2 shows some diagrams to explain the operation of the apparatus shown in Fig. 1,

Fig. 3 shows a version of the jump-signal generator 14 in the apparatus shown in Fig. 1,

Fig. 4 shows some diagrams to explain the operation of a part of the generator shown in Fig. 3, and

Fig. 5 shows some diagrams representing the various signals which appear when a jump is performed by means of the jump-signal generator shown in Fig. 3.

Fig. 1 shows an apparatus in accordance with the invention for reading a rotating optically readable record carrier 1. For the purpose of reading a light beam emitted by a laser 2 is projected on the record carrier *via* a pivotal mirror 3 and an objective 4, the beam which is reflected by this record carrier being projected on a detector 6 *via* a semi-transparent mirror 5. Specifically

in the case of VLP the laser beam comprises one main beam two sub-beams and the detector comprises 3 sub-detectors, so that by means of one tracking-error signal generator 15 a signal can be obtained which is a measure of the position of the landing spot of the laser beam relative to information tracks on the record carrier 1. By means of this signal the position of said spot is controlled in that the entire optical system 16 can be moved in a radial direction by means of a mechanism 22, shown symbolically, and in that the mirror 3 can be tilted by means of a motor 7, enabling the landing spot of the beam to be moved over a limited number of tracks in a rapid and accurate manner. This is described comprehensively in *inter alia* the magazine Philips Technical Review, Vol. 33, 1973, No. 7, pages 186, 189, United States Patent Specification 4,037,252, and German Patent Application No. 31.21.013, which has been laid open to public inspection, which publications are herewith incorporated by reference.

Fig. 2a schematically represents the structure of a video signal which has been read from the record carrier 1. For each picture said signal comprises two field synchronizing pulses S_1 and S_2, which after 16 picture lines are each followed by two picture lines (17 and 18) containing an address code (in principle it is also possible to use only one address code per picture). The visible part of the picture extends from line 21 up to line 262.5 (NTSC).

For some uses such as interactive players which cooperate with a game computer, it is desirable to be able to change the scene being reproduced without disturbing the field sequence, for which purpose the landing spot of the laser beam must be shifted radially over a plurality of tracks by means of the pivotal mirror 3. In particular since for such a use a plurality of scenes may have been recorded in parallel and may change from track to track, it is essential that such a radial jump ends on the desired track because otherwise a scene other than the desired scene may be reached. In order to be able to ascertain directly whether such a jump is correct, it is therefore necessary that the address code contained in lines 17 and 18 is read after the jump and that the jump therefore always terminates before line 17 of the next field.

Since a picture disturbance of a few lines in the lower part of the picture during one field just before a change of scene is not very annoying, the maximum number of tracks to be jumped can be selected in such a way that the maximum jump starts a specific number of lines before the last line of the visible video picture and terminates just before line 17 of the next field. In order to minimize the picture disturbance the instant at which the jump begins is always selected so that a minimal number of lines of the visible video picture is disturbed, jumping being effected in such a way that, if possible, a jump is made before the next address code after receipt of a jump command. This is possible by continuously measuring the time still available until the next address code appears.

In the embodiment shown in Fig. 1 this is achieved as follows. A detection circuit 8 derives a signal, for example shown in Fig. 2b, which is synchronous with the address code, or with line 17, from the video signal recovered by means of the detector 6. This signal each time starts a counter 9, which counts a counting signal supplied by a clock-signal generator 10. This counter 9 then supplies a signal which is a continuous measure of the time which has elapsed after the read-out of the last address code and consequently of the time available until the appearance of the next address code. The jump command is applied to an input 11 as a signal which is a measure of the number of tracks to be jumped, for example in the form of a digital signal. In a circuit 12 this signal is converted into a signal which is a measure of the time required for this jump. By means of a comparator 13 the time required is compared with the running time and a signal is generated when the time available until the appearance of the next address code corresponds to the time required. Fig. 2c shows an example of such a signal. By means of this signal a jump-signal generator 14 is started. This jump-signal generator 14 controls a swittch 23 which interrupts the connection between the tracking-error signal generator 15 and the motor 7, so that the motor 7 is controlled by this jump-signal generator 14 until a jump of the desired number of tracks is obtained. For this purpose the jump-signal generator 14 receives a signal indicating the number of tracks to be jumped from input 11 and a signal which indicates the passage of the tracks and which is supplied by a tracking-signal generator 15, of which examples are described in the publications referred to.

In its simplest form the circuit 12 for generating a signal which is a measure of the time required for the jump can establish a linear relationship between the time required and the number of tracks to be jumped. If a more accurate relationship is required, the circuit 12 may perform an algorithm which defines said relationship or may contain a conversion table based on this relationship. For example, allowance can be made for the non-linearity of this relationship as a result of starting and braking the movement of the pivotal mirror 3. It is also possible to select a fixed jumping instant by starting those jumps which require a time shorter than a specific time, for example all jumps requiring time which is shorter than the time between the last visible picture line of the relevant field and the next address code, at the end of said last visible picture line, an extreme jumping instant being defined only for longer jumps.

The tracking-signal generator 15, in known manner, supplies a control signal to the drive motor *via* the switch 23, in order to keep the laser beam aimed at the track to be followed when no jump is performed.

Fig. 3 shows a version of the jump-signal

generator 14. It comprises a control-signal generator 24 on whose input 25 a signal appears which *via* input 11 indicates the number of tracks to be jumped and on whose input 26 a starting signal from a comparator 13 (Fig. 1) appears. On an output 28 a signal appears which sets the switch 23 to the position shown in Fig. 1 for the duration of the jump. On an output 29 a signal appears which indicates the direction of the jump. The radial tracking-error signal generator 15 is applied to an input 27. By means of a limiter 32 the signal is converted into a squarewave signal which when the laser beam moves over the tracks in the radial direction exhibits a period corresponding to the time interval between the consecutive track passages and has edges appearing in the centre of the tracks and midway between the tracks. By means of an exclusive-OR-circuit 33 the signal is logically combined with the direction signal on output 29, so that a signal is obtained which is independent of the direction of the jump. This signal is applied to input 34 of the control-signal generator 24 which counts the number of tracks passed by means of this signal. On output 30 the control-signal generator 24 supplies a logic signal from an instant which appears a fixed time, for example 350 µsecs after the start of the jump until the end of the jump, and on output 31 the control-signal generator supplies a logic signal from the beginning of the jump until an instant at which the number of tracks to be jumped (n) minus a predetermined number of tracks (x) has been passed.

The jump-signal generator further comprises a first monostable multivibrator circuit 35 which receives a trigger signal T_s on an inverted trigger input $\overline{T}$, and a second monostable multivibrator circuit 36 which receives the trigger signal T_s on the trigger input T. *Via* an exclusive-or-gate 37 this trigger signal T_s is supplied by the output of the exclusive-or-gate 33, the gate 37 transferring this signal when a logic "1" appears on the other input of this gate 37. The monostable multivibrator circuits 35 and 36 are triggered by the signal on output 30 of the control-signal generator 24 and their time constant, *i.e.* the length of the pulse supplied, is changed over by the signal on the output 31 of the control circuit. The monostable multivibrators 35 and 36 supply signals T_1 and T_2, respectively, which are combined with the trigger signal T_s in the logic circuit 48 to form the signals T_h and T_l in conformity with the relationships:

$$T_h = \overline{T}_s \cdot \overline{T}_1 + T_s \cdot \overline{T}_2$$

$$T_l = \overline{T}_s \cdot T_2 + T_s \cdot T_1$$

The operation of the two multivibrators 35 and 36 and the circuit 48 will be described with reference to Fig. 4, which shows the signals T_s, T_1, T_2, T_l and T_h. When ignoring a possible inversion depending on the direction of the jump, the signal T_s is the limited tracking signal whose period is inversely proportional to the jumping speed. As it is triggered on its inverting trigger input, the multivibrator 35 supplies pulses of a fixed duration each starting at the trailing edges of the signal T_s, whilst the multivibrator 36 supplies the same pulses starting at the leading edges. The resulting signal T_l then has a relative pulse width which is proportional to the positive difference between the pulse width of the signal T_s and the pulse width of the signals T_1 and T_2, determined by the time constant of the multivibrators, or a relative pulse width which is a measure of the extent to which the jumping speed deviates in a negative sense from a nominal speed defined by the time constant of the multivibrators. Similarly, the relative pulse width of the signal T_h is a measure of the extent to which the jumping speed deviates from said nominal speed in a positive sense.

The signals T_h and T_l are applied to a commutator 38, which exchanges these signals depending on the jump direction indicated by the signal on output 29. Said signals T_h and T_l control switches 33 and 40 which supply a positive or a negative supply voltage to output 29 or which makes the output floating, so that the motor 7 accelerates, decelerates and freewheels, respectively.

The operation of the entire jump-signal generator 14 is explained with reference to Fig. 5, in which Fig. 5a represents the jumping speed v as a function of time. Figs. 5b, 5c and 5d represent the signals on outputs 28, 30 and 31 of the control-signal generator 24, Fig. 5e shows the limited radial tracking-error signal, and Fig. 5f shows a control signal for the motor 7 on output 29.

At an instant t_0 the comparator 13 supplies the starting command to input 26. *Via* output 28 (signal shown in Fig. 5b) switch 23 is changed over. *Via* output 31 (signal shown in Fig. 5d) the time constant of the multivibrators 35 and 36 is set to a small value corresponding to a high nominal jumping speed. Until an instant t_1 the signal on output 30 (signal shown in Fig. 5c) remains low, so that the two multivibrators are inoperative, the signals T_1 and T_2 are low, the signal T_h is high and the signal T_l is low. During the period t_0 to t_1 the motor 7 is then accelerated continuously (see Fig. 5a). At the instant t_1 the two multivibrators are started and the signals T_h and T_l corresponding to the diagram shown in Fig. 4 are generated. The jump is then performed with a substantially constant speed. After the passage of the number of tracks to be jumped (n) minus a predetermined number of tracks (x) at the instant t_2 the signal on output 31 (Fig. 5d) switches the time constant of the multivibrators to a high value corresponding to a low nominal speed. The circuit then also generates a train of braking pulses T_l until at instant t_3 this lower nominal speed is reached. Subsequently, the jump continues with said constant lower speed until at the instant t_4 the number of tracks to be jumped minus half a track is reached. At this instant the signal on output 28 resets the switch 23 (Fig. 1) and locking-

in to the desired track is effected *via* the tracking mechanism.

Since at the lower nominal speed the repetition frequency of the limited tracking-error signal decreases substantially a signal on an input 42 is combined with the output signal of the exclusive-or-gate 33 by means of the signal on output 31 *via* an or-gate 41 and an exclusive-or-gate 37. A signal which is 90° phase-shifted relative to the limited radial error signal is applied to this input 42. When the signal on output 31 is low, which is the case at the lower nominal speed, this signal is added to the limited radial tracking-error signal in the exclusive-or-gate 37, yielding a signal of twice the repetition frequency.

The device shown in Fig. 3 may be designed so that for a jump of less than a predetermined number of tracks (for example 25) the signal on output 31 (Fig. 5d) is kept low throughout jumping period, so that the mirror is controlled directly towards the lower of the two speeds.

It is to be noted that the apparatus described herein may be formed partly, in particularly parts 9, 12, 13 and 24, by a microprocessor.

Claims

1. Apparatus for reading a disc-shaped record carrier in which video signals are recorded in substantially spiral tracks in such a way that corresponding picture elements of consecutive video pictures are situated at substantially the same circumferential position on said record carrier, an address code being contained in at least one of the two fields of the video signal representing a video picture at a predetermined position (lines 17, 18) in the field blanking interval (lines 1—21) after the field-synchronizing pulse (S1), which apparatus comprises:

an optical system (4) for aiming a light beam at the record carrier, said light beam being modulated by the record carrier, and for converting said modulated light beam into an electric signal,

a converter (6) for converting said electric signal into a radial tracking-error signal which corresponds to the radial position of the landing spot of the light beam relative to a desired track,

positioning means (7) for controlling the position landing spot of the light beam as a function of the radial tracking error signal,

a jump-signal generator (14) for generating a control signal for causing the landing spot of the light beam to be shifted over a predetermined distance in response to a jump signal, and

means (23) for applying said control signal to the positioning means during said jump, characterized by

means (9) for generating a first signal which is a continuous measure of the duration of the period of time up to a reference point in the next field-blanking interval, which point precedes the address code in said field blanking interval,

means (12) for generating a second signal under command of the jump signal (11), which second signal is a measure of the anticipated duration of the jump to be performed in response to said command, and

means (13) for continuously comparing said first and said second signal and, in relation to the instant at which the two durations coincide, generating a starting signal (26) for the jump-signal generator at least if said instant appears prior to the field-synchronizing pulse preceding said address code.

2. An apparatus as claimed in Claim 1, characterized in that the means (9) for generating the first signal comprise counting means which are started each time (line 17) that an address code appears.

Patentansprüche

1. Lesegerät für einen scheibenförmigen Aufzeichnungsträger, in dem Videosignale in Spiralspuren derart aufgezeichnet werden, dass entsprechende Bildelemente aufeinanderfolgender Videobilder sich hauptsächlich an der gleichen Umfangsstelle auf diesem Aufzeichnungsträger befinden, wobei ein Adresscode in wenigstens einem der beiden Halbbilder des Videosignals enthalten ist, das ein Videobild an einer vorgegebenen Stelle (Zeilen 17, 18) in der Vertikalaustastung (Zeilen 1, ..., 21) nach dem Vertikalsynchronisationsimpuls (S1) darstellt, und das Lesegerät folgendes enthält:

ein optisches System (4) zum Richten eines Lichtstrahls auf den Aufzeichnungsträger, wobei dieser Lichstrahl vom Aufzeichnungsträger moduliert wird, und zum Umsetzen dieses modulierten Lichtstrahls in ein elektrisches Signal,

einen Wandler (6) zum Umsetzen dieses elektrischen Signals in ein radiales Spurnachführungsfehlersignal, das der radialen Auftreffstelle des Lichtstrahls in bezug auf eine gewünschte Spur entspricht,

Positionierungsmittel (7) zum Steuern der Auftreffstelle des Lichtstrahls abhängig vom radialen Spurnachführungsfehlersignal,

einen Sprungsignalgenerator (14) zum Erzeugen eines Steuersignals zum Verschieben der Auftreffstelle des Lichtstrahls über eine vorgegebene Strecke in Beantwortung eines Sprungsignals, und

Mittel (23) zum Zuführen des Steuersignals zu den Positionierungsmitteln während des Sprunges, gekennzeichnet durch,

Mittel (9) zum Erzeugen eines ersten Signals, das ein laufendes Mass für die Dauer der Periode bis zu einem Bezugspunkt in der folgenden Vertikalaustastung ist, wobei dieser Punkt vor dem Adresscode in der Vertikalaustastung liegt,

Mittel (12) zum Erzeugen eines zweiten Signals in Beantwortung des Sprungsignals (11), wobei dieses zweite Signal ein Mass für die erwartete Dauer des durchzuführenden Sprunges in Beantwortung des Sprungsignalbefehls ist, und

Mittel (13) zum ununterbrochenen Vergleichen des ersten und des zweiten Signals und, im Zusammenhang mit dem Zeitpunkt, zu dem die beiden Zeiten zusammenfallen, zum Erzeugen

in to the desired track is effected *via* the tracking mechanism.

Since at the lower nominal speed the repetition frequency of the limited tracking-error signal decreases substantially a signal on an input 42 is combined with the output signal of the exclusive-or-gate 33 by means of the signal on output 31 *via* an or-gate 41 and an exclusive-or-gate 37. A signal which is 90° phase-shifted relative to the limited radial error signal is applied to this input 42. When the signal on output 31 is low, which is the case at the lower nominal speed, this signal is added to the limited radial tracking-error signal in the exclusive-or-gate 37, yielding a signal of twice the repetition frequency.

The device shown in Fig. 3 may be designed so that for a jump of less than a predetermined number of tracks (for example 25) the signal on output 31 (Fig. 5d) is kept low throughout jumping period, so that the mirror is controlled directly towards the lower of the two speeds.

It is to be noted that the apparatus described herein may be formed partly, in particularly parts 9, 12, 13 and 24, by a microprocessor.

Claims

1. Apparatus for reading a disc-shaped record carrier in which video signals are recorded in substantially spiral tracks in such a way that corresponding picture elements of consecutive video pictures are situated at substantially the same circumferential position on said record carrier, an address code being contained in at least one of the two fields of the video signal representing a video picture at a predetermined position (lines 17, 18) in the field blanking interval (lines 1—21) after the field-synchronizing pulse (S1), which apparatus comprises:

an optical system (4) for aiming a light beam at the record carrier, said light beam being modulated by the record carrier, and for converting said modulated light beam into an electric signal,

a converter (6) for converting said electric signal into a radial tracking-error signal which corresponds to the radial position of the landing spot of the light beam relative to a desired track,

positioning means (7) for controlling the position landing spot of the light beam as a function of the radial tracking error signal,

a jump-signal generator (14) for generating a control signal for causing the landing spot of the light beam to be shifted over a predetermined distance in response to a jump signal, and

means (23) for applying said control signal to the positioning means during said jump, characterized by

means (9) for generating a first signal which is a continuous measure of the duration of the period of time up to a reference point in the next field-blanking interval, which point precedes the address code in said field blanking interval,

means (12) for generating a second signal under command of the jump signal (11), which second signal is a measure of the anticipated duration of the jump to be performed in response to said command, and

means (13) for continuously comparing said first and said second signal and, in relation to the instant at which the two durations coincide, generating a starting signal (26) for the jump-signal generator at least if said instant appears prior to the field-synchronizing pulse preceding said address code.

2. An apparatus as claimed in Claim 1, characterized in that the means (9) for generating the first signal comprise counting means which are started each time (line 17) that an address code appears.

Patentansprüche

1. Lesegerät für einen scheibenförmigen Aufzeichnungsträger, in dem Videosignale in Spiralspuren derart aufgezeichnet werden, dass entsprechende Bildelemente aufeinanderfolgender Videobilder sich hauptsächlich an der gleichen Umfangsstelle auf diesem Aufzeichnungsträger befinden, wobei ein Adresscode in wenigstens einem der beiden Halbbilder des Videosignals enthalten ist, das ein Videobild an einer vorgegebenen Stelle (Zeilen 17, 18) in der Vertikalaustastung (Zeilen 1, ..., 21) nach dem Vertikalsynchronisationsimpuls (S1) darstellt, und das Lesegerät folgendes enthält:

ein optisches System (4) zum Richten eines Lichtstrahls auf den Aufzeichnungsträger, wobei dieser Lichstrahl vom Aufzeichnungsträger moduliert wird, und zum Umsetzen dieses modulierten Lichtstrahls in ein elektrisches Signal,

einen Wandler (6) zum Umsetzen dieses elektrischen Signals in ein radiales Spurnachführungsfehlersignal, das der radialen Auftreffstelle des Lichtstrahls in bezug auf eine gewünschte Spur entspricht,

Positionierungsmittel (7) zum Steuern der Auftreffstelle des Lichtstrahls abhängig vom radialen Spurnachführungsfehlersignal,

einen Sprungsignalgenerator (14) zum Erzeugen eines Steuersignals zum Verschieben der Auftreffstelle des Lichtstrahls über eine vorgegebene Strecke in Beantwortung eines Sprungsignals, und

Mittel (23) zum Zuführen des Steuersignals zu den Positionierungsmitteln während des Sprunges, gekennzeichnet durch,

Mittel (9) zum Erzeugen eines ersten Signals, das ein laufendes Mass für die Dauer der Periode bis zu einem Bezugspunkt in der folgenden Vertikalaustastung ist, wobei dieser Punkt vor dem Adresscode in der Vertikalaustastung liegt,

Mittel (12) zum Erzeugen eines zweiten Signals in Beantwortung des Sprungsignals (11), wobei dieses zweite Signal ein Mass für die erwartete Dauer des durchzuführenden Sprunges in Beantwortung des Sprungsignalbefehls ist, und

Mittel (13) zum ununterbrochenen Vergleichen des ersten und des zweiten Signals und, im Zusammenhang mit dem Zeitpunkt, zu dem die beiden Zeiten zusammenfallen, zum Erzeugen

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eines Startsignals (26) für den Sprungsignalgenerator wenigstens dann, wenn dieser Zeitpunkt vor dem Vertikalsynchronisationsimpuls vor dem Adresscode erscheint.

2. Lesegerät nach Anspruch 1, dadurch gekennzeichnet, dass die Mittel (9) zum Erzeugen des ersten Signals Zählmittel enthalten, die jedesmal (Zeile 17) gestartet werden, wenn ein Adresscode erscheint.

Revendications

1. Appareil de lecture d'un support d'enregistrement en forme de disque sur lequel des signaux vidéo sont enregistrés dans des pistes sensiblement en spirale, de telle manière que des éléments d'image correspondants d'images vidéo successives sont situés sensiblement dans la même position périphérique sur ledit support d'enregistrement, un code d'adresse étant contenu dans au moins l'une des deux trames du signal vidéo représentant l'image vidéo, et cela dans une position prédéterminée (lignes 17, 18) dans l'intervalle de suppression de trame (lignes 1 à 21) qui suit l'impulsion de synchronisation de trame (S1), appareil comportant:

un système optique (4) pour diriger vers le support d'enregistrement un faisceau lumineux qui est modulé par le support d'enregistrement, et pour convertir ledit faisceau lumineux modulé en un signal électrique,

un convertisseur (6) pour convertir ledit signal électrique en un signal d'erreur de poursuite de piste correspondant à la position radiale du spot du faisceau lumineux par rapport à une piste désirée,

des moyens de positionnement (7) pour régler la position du spot du faisceau lumineux en fonction du signal d'erreur de poursuite de piste,

un générateur de signaux de saut (14) pour engendrer un signal de réglage pour faire déplacer le point d'impact du faisceau lumineux sur une distance prédéterminée sous la commande d'un signal de saut et

des moyens (23) pour appliquer, pendant ledit saut, le signal de commande aux moyens de positionnement, caractérisé par

des moyens (9) pour engendrer un premier signal qui est une mesure continue de la durée de la période jusqu'à un point de référence dans l'intervalle de suppression de trame suivant, point qui précède le code d'adresse dans ledit intervalle de suppression de trame,

des moyens (12) pour engendrer sous la commande du signal de saut (11) un second signal qui est une mesure de la durée prévue du saut devant être effectué en réaction à ladite commande et

des moyens (13) pour comparer lesdits premier et second signaux et, à l'égard de l'instant où les deux durées correspondent, engendrer un signal de démarrage (26) pour le générateur de signaux de saut pour autant que cet instant soit situé avant l'impulsion de synchronisation de trame précédant ledit code d'adresse.

2. Appareil selon la revendication 1, caractérisé en ce que les moyens (9) pour engendrer le premier signal comportent des moyens de comptage qui sont démarrés lors de chaque apparition (ligne 17) d'un code d'adresse.

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