

Description

The invention relates to an arrangement for reading and recording radio and/or television broadcasts, which arrangement consists of a receiver and a recording device.

Arrangements of this type are known in the form of, for example, video recorders with integrated replay devices (monitors) or separate televisions. In a different technical field, they are known in the form of radio cassette recorders with an integrated radio receiver part.

A recording device such as, for example, a dictating device with an automatic starting device which switches on the dictating device and in particular the drive for the recording carrier when the amplitude of the signal which is to be recorded exceeds an addressing level, is known from DE-OS 31 26 430. As a result of this embodiment, unnecessary use of the tape is avoided, since the device only operates when there is a signal indicating use.

In order that, in the case of a recording device of this type, the first part, after the start of the recording, is prevented from being

recorded in a distorted manner owing to the fact that the recording device has not yet reached the necessary speed of the recording carrier, a delay part, which delays the writing of the signal onto the writing carrier by a timespan which corresponds to the time which the recording carrier needs in order to reach its intended speed, is provided.

Furthermore, there may be seen from the publication Funkschau 1960, Volume 22, pages 559 to 561 that, in the case of a tape recorder which has a starting mechanism and which only begins to run when a signal which is to be recorded is present, that it is possible to delay the recording signal by a few seconds, for example by means of an endless auxiliary tape, in order to lose as little as possible of the start of the signal.

From US 4 282 602 it is known, in the case of live radio broadcasts, to delay the original signal prior to the broadcast by a certain timespan, such that it is possible to monitor the broadcast and, optionally, to suppress unwanted parts thereof, without this being noticeable to the person listening to the broadcast.

Lastly, there are known radio or television devices, in the case of which a few seconds of the broadcast which has been received can be played back (replay) by the listener/viewer during the broadcast. When this ends, the original broadcast is returned at this point, wherein the part of the broadcast that continued during the replay is lost. A recording according to the invention is neither desired nor possible in this connection.

DE-A-2 219 330 describes an arrangement for monitoring areas which are at risk, which arrangement consists of a camera and a video recorder. The video recorder comprises one or two continuously operating memories, the camera being accommodated in the cash till area and the video recorder being accommodated at another location. The stop signal, which is essential for the invention and which is intended to be given by a bank employee in the event of, for example, a robbery, is delayed in such a manner that a part of the previously recorded signals and a part of the subsequent signals are in the memory.

E-A1-3 333 078 likewise relates to a video surveillance, in the case of which it is essential to the invention that the camera is

connected to a visual frequency/audio frequency convertor and that this is, in turn, connected to an audio frequency tape recording device. The memory for signals, which is also present in this case, is stopped if required. The advantage of this surveillance device resides in that it is made easier, by the option of using cables for audio frequency signals in place of cables for visual frequency signals, to connect the video camera and the recording device over large distances.

DE-A1-3 015 737 relates to a recording device for surveillance purposes (of the type which are, for example, intended for use in vehicles for anti-theft securing or for documenting accidents), wherein this device also comprises, in addition to a time-lapse device, a memory which can be continuously deleted.

US-A4 430 676 describes a device for the selective recording of signals, in the case of which it is possible, for example, to record music, whilst leaving out the advertisements which interrupt it.

An automatic telephone answering device is described in EP-A2-0 262 978.

In US-PS 3 812 530, an arrangement is described which is intended to serve for a delayed tape recording of speeches at conferences or of telephone conversations; this device consists of a microphone for recording the sound which is transmitted to an endless tape of defined length and which is, if required, fed, in a time-delayed manner, by this latter into a tape recorder and recorded by this recorder.

Audio and/or visual recordings of a program which is running are conventionally performed by switching on the receive device, tuning into the desired broadcast channel or frequency, and starting to record at the point at which the viewer or listener enters the corresponding command into the recording device which has been prepared to record. Furthermore, it is already known to preprogram the recording, ie. to record without the viewer or listener watching or hearing the broadcast at the time.

In the case of recording devices of this type, it was found to be disadvantageous that, when the viewer or listener receives a visual and/or audio broadcast and, during the broadcast, for example during a piece of music or during a part of the program such as, for example, a news

or information programme, decides that he wishes to record this broadcast, the recording only commences at the point in time when this decision was taken, and it is not possible to obtain a recording which is retrospective, and thus complete.

On the other hand, it is impossible, for technical and economic reasons, to record all broadcasts as a precautionary measure in order that, subsequently, a small part is retained and the rest is deleted. This would lead to an excessively large use of recording material etc.

The object according to the invention consists in producing a receiving and recording arrangement for radio and/or television broadcasts, which arrangement consists of a receiving device and a recording device and with which it is possible, in the case of a sudden decision of the user, to record parts of a broadcast which is already running, which parts were already broadcasted prior to this decision.

This object is achieved according to the invention by means of the embodiment which is described in patent Claim 1.

In the case of the arrangement according to the invention, the information signal is thus put into interim storage for a certain period of time and, if required, made available to the recording device, such that, if the user suddenly decides to record a broadcast, the information signals which have already been transmitted in this period of time are still available. If, therefore, the user decides, within this period of time, to record a broadcast, this broadcast can be recorded in its entirety.

Particularly preferred developments and embodiments of the arrangement according to the invention are the subject matter of patent claims 2 to 11.

The arrangement according to the invention comprises an interim information memory, which term implies any device or arrangement which stores audio and/or visual information in a digital or analogue manner for a limited period of time, preferably 2 to 10 minutes, and in particular 3.5 to 6.5 minutes, and transfers these in the correct time series into its memory in a deleting manner, and uses the memory space which has become available as a result thereof to store, in an uninterrupted manner, the signals which

arrive subsequently. Examples of this type of memory are recording tapes which are conducted in a closed loop or recording discs, optionally with associated recording, erasing and replaying stations. In a different form of the memory which is used according to the invention, the information which was first stored is pushed through the memory by the subsequent information so that, in this embodiment, the information which has been stored travels through the memory. An example of a memory of this type is the shift register.

In order to make it easier for the average person skilled in the art of the construction of audio and visual recording devices (video recorders) on the one hand, and in the art of audio recording devices (radio recorders) on the other hand, the operating method of the interim information memory according to the invention or the arrangement according to the invention is described with reference to the following example:

The user of the radio recorder switches on his radio part. As a result of this switching on, the interim memory according to the invention is switched on simultaneously. In the present

case, the memory is intended to comprise a tape with a five minute runtime. This tape is conducted in a closed loop, optionally in the form of a Möbius tape, to obtain the desired capacity and reduction of the absolute length of the tape. Erasing heads are located in the area immediately in front of the recording heads; preferably, a recording head is used which records over the recorded tape in an erasing manner, such that, in this case, an erasing head may be omitted.

By means of the switching ~~circuit~~ which is known to the person skilled in the art, it is ensured that the program into which the user of the connected radio receive device has tuned at that time is, in each case, the program which is recorded in the interim memory.

In the present example the last five minutes are, in each case, stored by the interim memory. If, for example, while the broadcast is running, the user hears a song which he did not know or could not know would be transmitted during the broadcast, but which he would still like to record, he inserts a cassette in the usual manner and sets it to record, as a result of which the interim memory switches itself off immediately after the start of this recording. In this

manner, the last five minutes are located in the interim memory, whereas the subsequent part of the broadcast is recorded on the inserted cassette.

The timespan of five minutes was selected for this example because experience has shown that this is sufficient time in order, in the case of a device which is not prepared for recording, to take out a tape and insert it in the recording device and start the recording. In the case of conventional songs, which are of approximately three minutes duration, the inserted cassette would, if required, expediently only be started after the end of the song, in order to avoid subsequent collation of the two parts of the song. For this purpose, a memory of the (time) memory capacity of approximately 3.5 minutes is needed because of the song length of approximately 3 minutes which frequently occurs.

The recording device is preferably formed such that when the tape is inserted it is automatically wound forwards by the amount of time which corresponds exactly to the recording capacity of the interim memory, such that an "introductory space", on which nothing is recorded, is formed. Thus, later, the content of the (stopped and switched off) interim memory can

be transferred in a simple manner to the correct place, ie. the "introductory space" of the inserted tape.

In the case of a particularly preferred embodiment, the content of the interim memory is, when the recording is switched on, recorded onto the inserted tape directly and with a time delay, this being 5 minutes in the present case.

It is possible, in the described manner, to record, on recording carriers which are conventional per se (conventional recording cassettes for radios or video recorders for example) recordings which were received prior to the start of the conventional recording, in the present case in the 5 minute timespan prior to the start. It may easily be seen that, at the end, a recording, part of which was received before the recording using the usual recording carrier was started, is found on the recording carriers.

According to the invention, substantially the following three main versions of the arrangement according to the invention can be produced, as regards construction, by the average people skilled in the art in each case, without inventive activity:

Version I:

1. The interim memory is tuned to the frequency or program to which the receiving device is tuned by means of switching on the receiving device.
2. The recording in the interim memory is stopped by means of inserting the recording carrier (tape, disc or similar) and starting the recording and/or (in the case of the recording carrier already being inserted) by starting the recording, in which connection, if required, a short time delay can be set in such a manner that the recording in the interim memory is only stopped shortly after the start of the recording.
3. When the recording is switched off, the recording in the interim memory remains stopped (it may, if required, be provided that the interim memory be reactivated by means of the second command, in which case, however, the stored content of the interim memory, if it has not yet been transferred to the recording carrier, is lost).
4. Using a separate command, the memory content of the stopped interim memory is

subsequently transferred to the recording carrier which is provided, and is optionally "collated" with the subsequent part of the broadcast, which has been recording onto the conventional carrier.

5. The lock of the interim memory is cancelled by switching off the receiving device.

6. The interim memory is tuned to the frequency or channel to which the receiving device is tuned by means of switching on the receiving device.

Version II:

1. By switching on the receiving device, the interim memory is tuned to the frequency or the channel to which the receiving device is tuned.

2. The "introductory space" which has been described is either formed in that, when the recording carrier is inserted and/or at the start of the recording, the recording carrier is wound forward by the capacity of the interim memory at the start of the recording on the recording carrier, in which connection the resulting "introductory space", which is

blank, corresponds to the memory content of the interim memory.

If the introductory space is formed by inserting the recording carrier, this part of Version II corresponds to step 2 of Version I.

If the introductory space is only formed by the signal "record" then the recording on the interim memory only ends when the tape has been wound forward and the recording has started.

3. When the recording is switched off, the transfer to the interim memory is also stopped. (See also 3. Version I.)

4. The memory content of the stopped interim memory is transferred to the "introductory space" of the recording carrier. For this purpose it may be provided that, during switching off or transferring to the interim memory, this latter stores a signal which cooperates with a corresponding signal on the conventional recording carrier, which is generated thereon at the start of the recording, in such a manner that the content of the interim memory can subsequently be transferred almost "seamlessly" onto the conventional

recording carrier in front of the recording, ie. in the introductory space.

5. The locking of the transfer to the interim memory is cancelled by switching off the receiving device.

6. The transfer to the interim memory on the frequency or the channel to which the receiving device is tuned is started (switched on) by switching on the receiving device.

Version III:

1. The interim memory is tuned into the frequency or the channel which is set in the receiving device by switching on the receiving device.

2. The transfer to the recording carrier is performed via a permanent interim memory and time-delayed by the memory capacity by inserting the recording carrier and starting the recording or (in the case of recording carriers that are already inserted) at the start of the recording. The term "permanent intermediate memory" is intended to mean that, in this version, this is not switched off, but, rather, the transfer

of the broadcast to the recording carrier is performed continuously, in a time-delayed manner, by the permanent interim memory. In this version, the interim memory which has been described and in the case of which the stored signals pass through the memory (eg. a shift register) is preferred.

3. The switching off of the recording actually performs the switching off of the transfer via the permanent interim memory onto the recording carrier, in which connection the recording carrier stops whilst the interim memory continues running. The command to switch off the recording may optionally be processed in a time-delayed manner, in order to equalise the delay by means of the laterally displaced transfer to the interim memory and still transfer the content of the interim memory from the time of the command to the switching off of the recording to the recording carrier in its entirety.

4. The subsequent transfer of the content of the interim memory to the actual data carrier is omitted.

5. The interim memory is simultaneously switched off, optionally with a delay as described under 3, by means of switching off the receiving device.

6. By switching on the receive device, the interim memory is tuned to the frequency or the channel to which the receive device is tuned.

Version I is the simplest version of the embodiment of the invention which is shown here by way of example, Version II is a preferred version thereof and Version III is the most preferred version.

In the case of another simple embodiment of the device according to the invention, the interim memory may be a separate component, which, in the arrangement according to the invention, consists of a receiving device and a recording device which is parallel switched to the latter. In this connection, it comprises, as described, for example an annular tape, an endless tape, a memory disc or another memory which is suitable according to the invention, and a recording station, a replaying station and an erasing station, optionally also in combination with one another. It may be coupled, as regards the

switching, in accordance with to versions I to III, with the combination of recording and receive devices which is known per se.

Preferably, however, the stations which are used in the case of the devices known per se are used. Thus, in the case of double cassette decks for example, the stations of the cassette deck which are not provided for direct recording are also suitable.

If, in this case, in a preferred manner, the arrangement according to the invention is described with reference to a radio cassette recorder, then the teaching according to the invention also applies for the person skilled in the art in the field of video recorders, such that, in this case, it is rendered possible according to the same inventive principle that, during a television broadcast, that which has just been viewed is finally obtained stored on a conventional video cassette, although the cassette was, at that time, not inserted for the recording and/or not started.

The teaching according to the invention can be performed by the average person skilled in the art in various ways; in the case of a

preferred embodiment, the intermediate memory according to the invention is integrated in the recording device or the receiving device to achieve the object according to the invention, such that a radio recorder a video recorder or a television device of this type is commercially available.

It is, however, also conceivable to form the intermediate memory which has been described and which is suitable for the object and the solution according to the invention, as a separate component, either as a module or as a separate device.

CLAIMS

1. Arrangement for reading and recording radio or television signals, consisting of a radio or television receiver, a recording device and an interim information memory, characterised in that the switching on of the receive device switches on the interim memory to the frequency/channel to which the receiving device is tuned; in that the interim information memory has a limited capacity, which corresponds to a short-term memory time of preferably not more than 10 minutes, in particular of not more than 6.5 minutes; in that an access and connection device is provided, which, in dependency on the user actuating the recording device, makes the information signals stored in the interim memory available to the recording device; and in that the command to switch off the recording device is processed after a delay of the predetermined timespan and the content of the interim memory from the time of the command to switch off the recording is still transferred in its entirety to the recording carrier.

2. Arrangement according to Claim 1, characterised in that the access and connection device transfers, after actuation of the recording device, the information signals which have



subsequently been received to an interim memory in the interim information memory on the recording device.

3. Arrangement according to any one of the preceding claims, characterised in that the interim information memory is an annular, tape-shaped information carrier or a memory disc.

4. Arrangement according to any one of the preceding claims, characterised in that the interim information memory is a memory which processes the information serially.

5. Arrangement according to any one of the preceding claims, characterised in that recording, replaying and erasing stations which may be provided cooperate with the interim memory.

6. Radio and/or television recording device with an interim information memory for a receive and recording arrangement according to Claim 1, characterised in that interim information memory has a limited capacity, which corresponds to a short-term memory time of preferably not more than 10 minutes, in particular of not more than 6.5 minutes, an access and connection device is provided, which, in dependency on the user



actuating the recording device, makes the information stored in the interim memory available to the recording device, and the command for switching off the recording device is processed after a delay of the predetermined timespan, and the content of the interim memory is, from the time of the command to switch off the recording, still transferred in its entirety to the recording carrier, wherein the recording device is prepared for cooperation with a radio and/or television set, in a manner such that the switching on of the receive device switches on the interim memory to the frequency/channel to which the receive device is tuned.

7. Radio and/or television receiving device with an interim information memory for a receiving and recording arrangement according to Claim 1, characterised in that the switching on of the receive device switches on the interim memory to the frequency/channel to which the receive device is tuned, and the interim information memory has a limited capacity corresponding to a short-term memory time of approximately no more than 10 minutes, in particular not more than 6.5 minutes, prepared for cooperation with a recording device, which processes the command for switching off the recording device after a predetermined timespan



and wherein the content of the interim memory, from the time of the command to switch off the recording, is transferred in its entirety to the recording carrier.



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