

VIDEO RECORDER WITH ALARM MEMO

DESCRIPTION

The present invention relates to a video recorder and a method of displaying a message employing a timer means and an on-screen display means of a video recorder.

Figure 1 is block diagram representing a conventional on-screen display circuit in a video tape recorder. That is, a conventional arrangement provides a time reservation/recording function and an on screen display function.

In this conventional on screen display circuit, the data is applied from a remote control device (RE). That is, the normal data used to drive the video tape recorder, and the data used to reserve time, are stored into a storage unit (for example, a RAM as shown in figure 1) via a SYSCON integrated circuit (IC). The SYSCON IC is a microprocessor. The storage unit (RAM) is composed of non-volatile RAMs (NVRAM), normally used to memorize PAL-type channel data, so that stored data is retained even if the main power is switched off.

Using the timer function to set the reservation time required by a user, the SYSCON integrated circuit (IC) applies stored channel data to a tuner block (TU), at the

predetermined time. The SYSCON integrated circuit (IC) also applies the on screen display signal data, according to the reserved functions (e.g. channel number, volume status, etc,) to the on screen display unit (OSD). The on screen display signal transmitted to the on screen display unit (OSD) is applied into the tuner (TU), such that it can be displayed on the CRT screen along with the image signal of the assigned channel.

The SYSCON integrated circuit (IC) is connected to a luminance and chrominance signal unit (Y/C), a servo (SE), and a digitron (DI). The digitron (DI) displays the status of the video tape recorder.

The above described conventional on screen display function has provided much convenience to users, by being able to display the current status of a video tape recorder and associated reserved or recording functions on the television screen.

According to a first aspect of the present invention, there is provided a video recorder comprising: an on-screen display means; a timer means for controlling unattended recording; means for selecting a message storage mode; means for entering variable alphanumeric message data; means which store the time at which the

message data is to be displayed, wherein the timer means is responsive to said stored time to apply said message data to the on-screen display means for display.

According to a second aspect of the present invention there is provided a method of displaying a message employing a timer means and an on-screen display means of a video recorder, comprising the steps of: (a) determining whether a message storage mode is in operation; (b) storing the time at which the input message is to be displayed; (c) storing the message to be displayed; and (d) displaying the message by means of the on-screen display means when the timer means determines that the display time has been reached.

Convenience is thus improved further by the provision of an alarm memo function. With an alarm memo function users are able to leave a memo for another person. The memo can be displayed at the pre-recorded time, along with the conventional on screen display function.

Currently, users normally have to use notepaper to leave a message concerning operation of the video tape recorder, and other matters. This can, however, be inconvenient. For example, if the other person is watching television it is easy to forget the time written

on the notepaper, or the notepaper may not even be discovered until after the relevant time has passed.

An embodiment of the invention will now be described in detail, by way of example only and with reference to the accompanying drawings, in which :-

Figure 1 is a block diagram representing the on screen display circuit used in a conventional video tape recorder,

Figure 2 is a flowchart showing the action flows of the alarm memo using the time reservation function, and

Figure 3 is a flowchart showing the input process among the action flows of the alarm memo using the time reservation function.

Figure 2 is a flowchart showing the implementation of an alarm memo function using the time reservation function. The process comprises a mode decision routine (L1), a time input routine (L2), an input process (P), a

standby decision step (S17), and a display routine (L5). These processing routines can be implemented using the conventional on screen display circuit hardware. However, the circuitry preferably includes a character mode key (CH), in addition to the normal key matrix used in a conventional remote control device. The SYSCON integrated circuit (IC) interprets the input signal as one of four types of mode depending upon how the character mode key (CH) operates.

One of the four types of mode is conventional operation of the remote control device.

Three types of switching signals can also be produced in accordance with operation of the character mode key (CH). That is, if the numeric key is selected before the character mode key (CH) is selected, the number selected is recognized in the conventional manner. However, if the numeric key is selected after the character mode key (CH) is selected, the number selected is recognized as a character. This will be explained further, hereinafter.

In the present invention, three different characters (e.g. letters of the alphabet) are assigned to each numeric key. The SYSCON integrated circuit (IC) interprets a selected number as a specific character according to the current switching status and the key

selected - provided that the numeric key is selected after the character mode key (CH). For example, one of the three characters, A B and C can be indicated by the numeric key designated as 1, in accordance with the type of switching signal produced by operation of the character mode key. Specifically, if the numeric key 1 is selected after a first switching signal is produced by selecting the character mode key (CH), the SYSCON integrated circuit interpretes the numeric key 1 as a character, A. The numeric key 1 can be interpreted as characters B and C, respectively, if it is produced after a second and a third switching signals are produced.

The character mode key (CH) is preferably a four position slide switch with depression of the slider acting to initiate a switching signal, dependent upon the position of the slider when depressed. Considering the four slider positions as positions 1 to 4, position 1 corresponds to conventional operation of the numeric keys and positions 2 to 4 respectively correspond to the other three modes (ie, the first to third switching signals). Hence, although the mode is set according to slider position, a character mode is initiated when the slider is depressed. It will be readily apparant that various alternative arrangements to implement the character mode key (CH) functionality are easily achieved.

Each processing routine has several steps as described below.

The mode decision routine(L1) determines whether the SYSCON integrated circuit (IC) is in the alarm memo storage mode. Routine(L1) performs the following steps in sequence; a timer mode decision steps(S1) determines whether a time reservation mode is in operation, an alarm memo mode decision step(S2) determines whether the alarm memo mode is in operation, and another time reservation function step(S3) performs other types of time reservation function (if the alarm memo mode is not in operation after the alarm memo mode decision step(S2) is completed).

The time input routine(L2) performs the following steps in sequence, so as to record the time to display the stored alarm memo data; a starting time set decision step (S4) determines whether the time to display the alarm memo data is set, and an ending time set decision step (S5) determines whether the time to stop displaying the alarm memo data is set.

The data input process (P), which captures the data to be memorized, performs the following routines in sequence; a data storing routine(L3) stores character or

numeric data, a data modification routine (L4) shifts or clears the stored data, and an alarm memo stop decision step (S16) operates.

At this time, the data storing routine(L3) performs the following steps in sequence; a numeric mode decision step(S6) determines whether the character mode key (CH) or the numeric mode key is selected; the first, second and third character mode decision steps (S7) (S8) (S9) determine whether the first, second or third character mode is in effect respectively, according to the switching status of the character mode key(CH); a numeric key decision step(S10) determines whether the numeric key is selected, and a storing step(S11) stores numeric or character data depending upon the current status of the character mode key and the selected numeric key.

The data modification routine(L4) performs the following steps in sequence; a shift key decision step(S12) determines whether the shift key is selected, and a shift step (S13) inserts space between data to be displayed.

If the shift key is not selected after performing the shift key decision step(S12), the following steps are performed in sequence; a clear key decision step (S14)

determines whether the clear key is selected, and a clear step(S15) moves the cursor back to the previous position after deleting the displayed alarm memo data at the current position. Finally, the alarm memo stop decision step (S16) determines whether the alarm memo input mode is over.

The display routine(L5) performs the following steps in sequence; a standby decision step (S17) is completed, a starting time decision step(S18) determines whether it is time to display the alarm memo data, a display step (S19) displays the alarm memo data as appropriate, an ending time decision step (S20) determines whether it is time to stop displaying the alarm memo data, a timer-stop decision step(S21) determines whether the timer is stopped before reaching the ending time, a display suspension step (S22) suspends displaying alarm memo data, and a clearing step (S23) clears the stored alarm memo data.

With the above routines and steps, implementation of the alarm memo using the time reservation function will now be explained from the procedural point of view.

First, the SYSCON integrated circuit (IC) performs the timer mode decision step (S1) to determine whether the time reservation mode is in operation, after determining

if the time reservation key is selected on the key matrix of the remote control device.

In the case of time reservation mode being in operation, the alarm memo mode decision step (S2) determines whether the alarm memo mode is in operation. If it is, the time input routine (L2) is performed. Otherwise, another time reservation function step (S3) performs other types of time reservation functions.

In the time input routine(L2), the starting time set decision step (S4) determines whether the user has input a start time for display of the alarm memo data and whether the preset time has been reached. If the time input routine(L2) is over, the ending time set decision step (S5) determines whether the user has input the ending time to stop the display of the alarm memo data and whether the preset time has been reached.

After the ending time set decision step (S5), the numeric mode decision step (S6) determined whether the character mode key (CH) or the numeric key is selected. If the character mode key (CH) is selected; the first, second and third character mode decision steps (S7)(S8)(S9) have determined the current switching status, the selected numeric key is interpreted as described in the table below:

Table 1.

selected numeric key	first mode	second mode	third mode
1	A	B	C
2	D	E	F
3	G	H	I
4	J	K	L
5	M	N	O
6	P	Q	R
7	S	T	U
8	V	W	X
9	Y	Z	?
0	,	/	=

In short, a character is selected in terms of the mode determined by the first, second and third mode decision steps (S7)(S8)(S9) and the numeric key identified by the numeric key decision step (S10).

That is, if a user wants to put in characters, he can simply put in numeric keys appropriate to the required character after controlling the character mode key.

After the numeric key decision step (S10) determines whether the numeric key is selected, the storing step

(S11) stores character data chosen in accordance with Table 1.

In brief, in the data storing routine (L3), when the character mode key (CH) is operated, the mode is determined according to the switching status of the character mode key (CH). After the selected numeric key is detected by the numeric key decision step (S10), the storing step (S11) stores the chosen character, in accordance with Table 1. If the numeric key is not preceded by the character mode key (CH), the storing step (S11) stores the selected number after the numeric key decision step (S10) determines which numeric key has been operated.

If it is determined in the numeric key decision step (S10) that a numeric key has not been selected, the control is passed to the data modification routine (L4). In the routine (L4), the shift key decision step (S12) determines whether the shift key is selected. If it is selected, the shift step (S13) provides space between the alarm memo data displayed.

Unless the shift key is selected, the clear key decision step (S14) determines whether the clear key is selected. If it is selected, the clear step (S15) moves the cursor back to the previous position after deleting

the displayed alarm memo data at the current position.

The alarm memo step decision step (S16) determines whether the alarm memo function is halted by a user. If halted, the standby decision step (S17) is run to decide whether the timer is in standby state. If the timer is not in standby state, the SYSCON integrated circuit (IC) terminates the whole process.

If the time set to display the alarm memo data is reached during the timer standby state, the display routine (L5) (which displays the alarm memo data for the present duration) drives its sub-routines. In this routine (L5), the starting time decision step (S18) determines whether it is time to display the alarm memo data. If so, the display step (S19) displays the stored alarm memo data on the television screen.

While the display step (S19) is performing its role, the ending time decision step (S20) determines whether it is time to stop displaying the alarm memo data.

If it is time to stop, or if the timer-stop decision step (S21) determines that the timer key is selected to stop the timer, even before reaching the ending time, the display suspension step (S22) suspends the display of the alarm memo data.

Thereafter, the displayed alarm memo data is cleared by the clearing step (S23). Finally, the SYSCON integrated circuit returns the video tape recorder to its previous state, e.g. if the video tape recorder was turned off before displaying the alarm memo data, the video tape recorder will be turned off again after displaying the alarm memo data.

As mentioned above, the alarm memo data can be stored using the key matrix on the remote control device of a video tape recorder having a time recording function. The arrangement displays the stored alarm memo data on the television screen during the preset period, thereby reminding the user of something which may otherwise easily be forgotten.

The invention is not limited to the embodiment described hereinabove. Various modifications of disclosed embodiment as well as other embodiments of the invention will be readily apparent to persons skilled in the art. The appended claims are intended to cover all such modifications and embodiments.



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CLAIMS

1. A video recorder comprising:

an on-screen display means;

5 a timer means for controlling unattended recording;

means for selecting a message storage mode;

means for entering variable alphanumeric message data;

means which store the time at which the message data is
to be displayed,

10 wherein the timer means is responsive to said stored
time to apply said message data to the on-screen
display means for display.

2. A method of displaying a message employing a

15 timer means and an on-screen display means of a video
recorder, comprising the steps of:

(a) determining whether a message storage mode is in
operation;

(b) storing the time at which the input message is
20 to be displayed;

(c) storing the message to be displayed; and

(d) displaying the message by means of the on-screen



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display means when the timer means determines
that the display time has been reached.

5 3. A method according to claim 2, wherein step (c)
comprises the steps of:

- (c1) storing alphabetic or numeric character data;
- (c2) shifting or clearing stored data to thereby
modify it; and
- 10 (c3) determining whether the complete message has
been entered.

4. A method according to claim 2, wherein step (a)
comprises the steps of:

- 15 (a1) determining whether a timer reservation mode is
in operation;
- (a2) determining whether a message mode is in
operation; and
- (a3) performing another type of time reservation in
the event that said message mode is not in
20 operation.



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5. A method according to claim 2, wherein step (b) comprises the steps of:

- (b1) entering a message display start time; and
- (b2) entering a message display stop time.

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6. A method according to claim 2, wherein step (d) comprises the steps of:

- (d1) determining that the display time has been reached;
- 10 (d2) displaying the message by means of the on-screen display means;
- (d3) determining whether the timer means has stopped before a display end time has been reached;
- (d4) suspending display of the message; and
- 15 (d5) clearing the stored message.

7. A method according to claim 3, wherein step (c1) comprises the steps of:

- (c1a) determining whether an alphabetic character mode
- 20 key has been selected;
- (c1b) determining whether a first, second or third alphanumeric character mode has been selected according to the switching status of the



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alphabetic character mode key;

(c1c) determining whether a numeric key has been selected; and

(c1d) storing numeric or alphabetic character data in dependence on the current status of the alphabetic character mode key and the selected numeric key.

8. A method according to claim 3, wherein step (c2) comprises the steps of:

(c2a) determining whether a shift key has been selected;

(c2b) creating a space between message data to be displayed; and

(c2c) determining whether a clear key has been selected, if the shift key has not been selected, and then deleting the current message character and moving a cursor back to its previous position in response to selection of the clear key.