(72) Inventor: Scholz, Gerhard, Ing. grad. Vienenburger Strasse 18, D-3387 Vienenburg 2 (DE)

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SIEMENS-ZEITSCHRIFT, Vol. 47, No. 3, March 1973, ERLANGEN (DE) K. LANG et al.: "Digitaler vocoder für Sprachausgabe aus Datenverarbeitungsanlagen", Pages 131-135.

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Specification

With increasing equipment in the course of time, the operation and programming of a video recorder have become considerably more difficult, particularly as many new operating functions have been added in comparison with former devices in entertainment electronics. Often a plurality of operating elements have to be actuated in a specific sequence or even simultaneously. Operation and programming are therefore difficult even after lengthy practice. It is true that the instructions for correct operation of the recorder are contained in an operator's manual. Because of the large number of functions such as transmitter programming, programming a time, recording, reproduction, quick-motion, slow-motion, still picture reproduction for example, such operator's manuals are very voluminous. The necessary knowledge about operation generally has to be frequently acquired anew by re-reading the operator's manual. In practice, the operation of such recorders often involves difficulties even for expert operators. This can lead, inter alia, to the fact that for example a wanted transmission

is not recorded during absence or a recording already in existence is erased in an unwanted manner.

As an aid to programming, an arrangement for video recorders is known according to DE-OS 2 918 846 according to which a listing of preprogrammed recording data giving the required switching functions is given on the viewing screen of an attached television set in order to maintain clarity.

The object of the invention is to simplify the general operation of a video recorder.

This problem is solved by the invention described in Claim 1. An advantageous further development of the invention is described in a dependent claim.

With the invention, an ordinary commercial television receiver, which is connected to the video recorder via known connections both in the high-frequency plane and in the video-audio plane, can be used to transmit, optically or acoustically, the particular instructions necessary for operation to the operator in a clear and understandable form. The operator can then choose between the various possibilities according to his wishes. Thus the operator always has a guide for the correct operation in each case. Thus the operator's manual is stored in the video recorder and therefore cannot become lost either.

The information represented optically or acoustically may be of different kinds. It may contain a request for the operator to do something specific. It may contain confirmation that the operating function carried out was understandable to the recorder and has been utilized. It may also indicate that there has obviously been a faulty operation and the operator should repeat the operation.

The invention can cover all kinds of operation occurring in practice. The operation may be effected via an ultrasonic or infrared telecontrol transmitter or by means of the bank of keys contained in the recorder, which keys can be checked

via an LED/LCD display. The invention is also particularly advantageous during the programming of the video recorder. This consists of the transmitter programming with station finding, fine tuning, direct channel selection and storage of the tuning information. In addition, it includes the drive and time programming, the time, on-off programming with the drive mode such as recording and reproduction for example as well as the forward run and rewind and also the selecting winding. The programming also renders possible corrections anywhere on the tape.

The control signals from the video recorder to the reproduction equipment, explaining the operation, may contain a text, a specific chart, tables, operating symbols as well as speech and other sound signals in coded and uncoded form.

The signal can be supplied from the video recorder to the reproduction equipment, for example an ordinary commercial television receiver, as a colour video signal to the so-called AV socket. In this case, an a.f. signal is additionally transmitted for the reproduction of speech and sound. This signal can be obtained in the video recorder in a circuit for the synthetic production of speech signals, a so-called speech synthesis module. The signal can also be supplied, by means of a modulated carrier, to the aerial socket of a television receiver.

One example of embodiment of the invention is explained below with reference to the drawing. In this, Figure 1 shows, in principle, the interconnection between video recorder and television reciver in order to establish the dialogue and Figure 2 shows a block circuit diagram of the video recorder in which the solution according to the invention is realized.

In Figure 1, the video recorder 25 is remote-controlled in all its functions by the telecontrol transmitter 26. The video recorder 25 can receive a high-frequency television boradcast signal via the aerial 20, process it and record it.

During this operation, the video recorder 25 delivers signals to the ordinary commercial television receiver 21. These signals contain instructions and acknowledgements about the operation and are reproduced on the viewing screen and/or via the loudspeakers. This signal input may be effected in the form of a carrier modulated with the signals via the line 19 to the aerial socket of the television receiver 21 or as a colour video signal and a.f. sound signal via the line 18 to an AV socket of the television receiver 21. In the example illustrated, the television receiver 21 is giving the operator the request "Please select channel". After a channel has been selected, confirmation can then be given that the channel information has been understood and utilized and so the receiving portion of the video recorder is tuned to a specific channel.

Various functions will be described in succession with reference to Figure 2.

Processing the high-frequency signal.

In Figure 2, the high-frequency signal of a television transmitter, received by the aerial 20, reaches the tuning unit 6. From there, it can again be switched directly to an output of the video recorder 25 and reach the aerial socket of the television receiver 21 via the line 19. In the tuning unit 6, the signal received is decoded into picture and sound signals and recorded on the video tape via the control unit 5 and the recording unit 2 with the drive unit 1. These signals may additionally be fed via the control unit 5 to the AV output of the video recorder 25 and from there via AV lines 18 to the television receiver 21. This switching through of the received signals to the television receiver 21 can also be effected without recording of the signals on the video tape.

The microprocessor 11 is in continuous data exchange with the operator's manual stored in the store 10 and controls the data/colour-video-signal converter 9 with data

which is supplied to the control unit 5 as a colour video signal. From there, this signal can pass to the high-frequency modulator 3 and via the line 19 to the aerial socket of the television receiver 21. The signal can also be supplied directly to the television receiver 21 via the AV line 18. With these functions, a recording of the signals is possible simultaneously via the recording unit 2 and the drive unit 1.

Speech production.

The generation of speech signals takes place as follows. The microprocessor 11 controls the speech generator 12 with data which reach the control unit 5 as a.f. signals. These can be additionally transmitted, alone and/or together with the colour video signal of the converter 9, which is appropriately controlled by the control unit 5, to the television receiver 21 via the AV line 18. The data can also be fed to the aerial socket of the television receiver 21 via the high-frequency modulator 25 and the line 19. In addition, the signal can be recorded on the video tape via the recording unit 2 and the drive unit 1.

Reproduction possibilities

Via the reproduction unit 4, the AV signal is supplied from the drive unit 1 via the control unit 5 to the AV output and from there via the AV line 18 to the television receiver 21. The signal can likewise reach the high-frequency modulator 3 and be supplied from there, as a modulated carrier, to the television receiver 21 via the line 19.

Operating possibilities

The operation of the video recorder 25 can be effected via the keyboard 16 at the video recorder. The interrogation is effected via the control unit 15 for the keyboard from which a data exchange is effected with the microprocessor 11 and hence also with the operator's manual stored in the store 10. The display of the operated keys and of the desired results is effected via the control unit 15, which is

operated by the microprocessor 11, by means of a display unit 17 of LED/LCD construction.

The operation of the video recorder 25 can also be effected via ultrasonics (US) or infrared (IR) from the telecontrol transmitter 26 illustrated in Figure 1. These signals are received by the preamplifier 13 and amplified and converted into digital signals in the telecontrol transmitter and decoder 14. These signals are then taken over by the microprocessor 11 for the further processing.

The keys operated each time and the desired results are conveyed in the form of data from the microprocessor 11 to the converter 9 and/or speech generator 12. From the outputs of these, they are switched to the control unit 5 and supplied to the television receiver 21 via the AV output and the lines 18. These data can additionally be recorded on the video tape via the control unit 5, the recording unit 2 and the drive unit 1.

The control unit 8 serves to control recording, reproduction, drive functions and control of the tuning unit 6. The control unit 8 connects the microprocessor 11 to the reproduction unit 4, the recording unit 2 and the tuning unit 6. It serves to relieve the microprocessor 11. The microprocessor 11 delivers operating instructions to the control unit 8. From there they are passed on to the modules connected up. The drive unit 1 transmits various signals such as "End of tape", "Selection winding ended", "Beginning of tape" and the like, to the control unit 8 which passes on these signals to the microprocessor 11 where they are then further processed.

Programmable clock

The programmable clock 7 for the automatic switching on of functions of the drive unit 1 is operated by its own crystal as a time standard. By means of a special circuit it is possible for it to continue to run with a low power consumption even in the event of mains failure. The clock 7 is programmable in time of day, date and switching times.

* C L M S *

Patent Claims

1. A video recorder having a plurality of operating elements which have to be actuated by the operator in accordance with an operator's manual and having signal generators for control signals which cause displays concerning the operating state of the recorder on a television reproduction apparatus which is connected up, characterised in that the operator's manual is stored in the recorder (25) and the control signals explaining the operation are produced by a microprocessor (11) via a data/colour-video-signal converter (9).

2. A recorder according to Claim 1, characterised in that it contains a circuit (12) for the synthetic production of speech signals for the control signals explaining the operation.

Figure 1

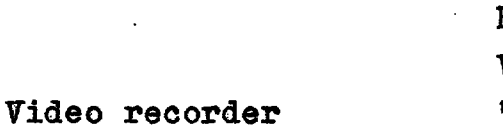


Figure 2

