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(54) Apparatus and method for remote control programming of a video recorder

(57) A remote control unit for selecting a channel and time for information recordal by a video recorder has a key matrix (1), a processor (2) and a display (3). The channel and time required are selected using the key matrix (1) under the control of the processor (2) and the selection made is displayed on display (3). Subsequently, the selection information is transmitted to the video recorder, using a plurality of discrete groups of signals.

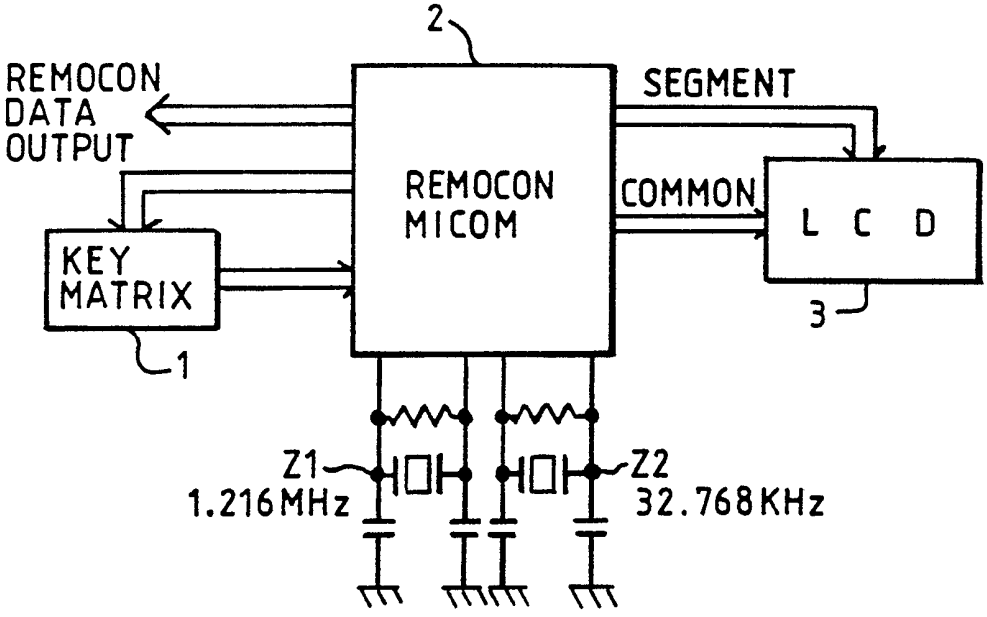


FIG.1.

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

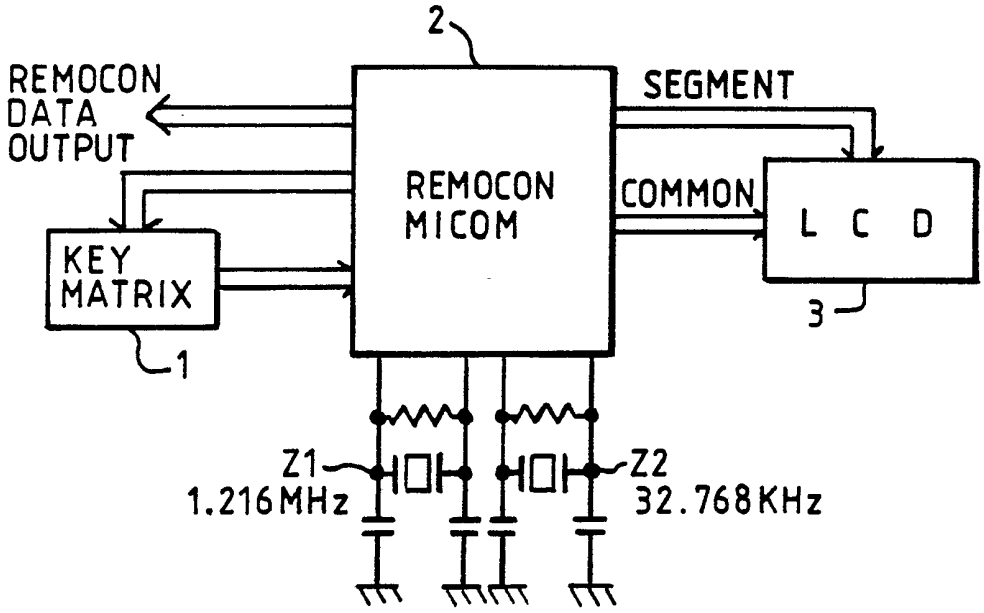

2
REMOCON
DATA
OUTPUT
SEGMENT
REMOCON
MICOM
COMMON
L C D
3
KEY
MATRIX
1
Z1
1.216MHz
Z2
32.768KHz

FIG. 1.

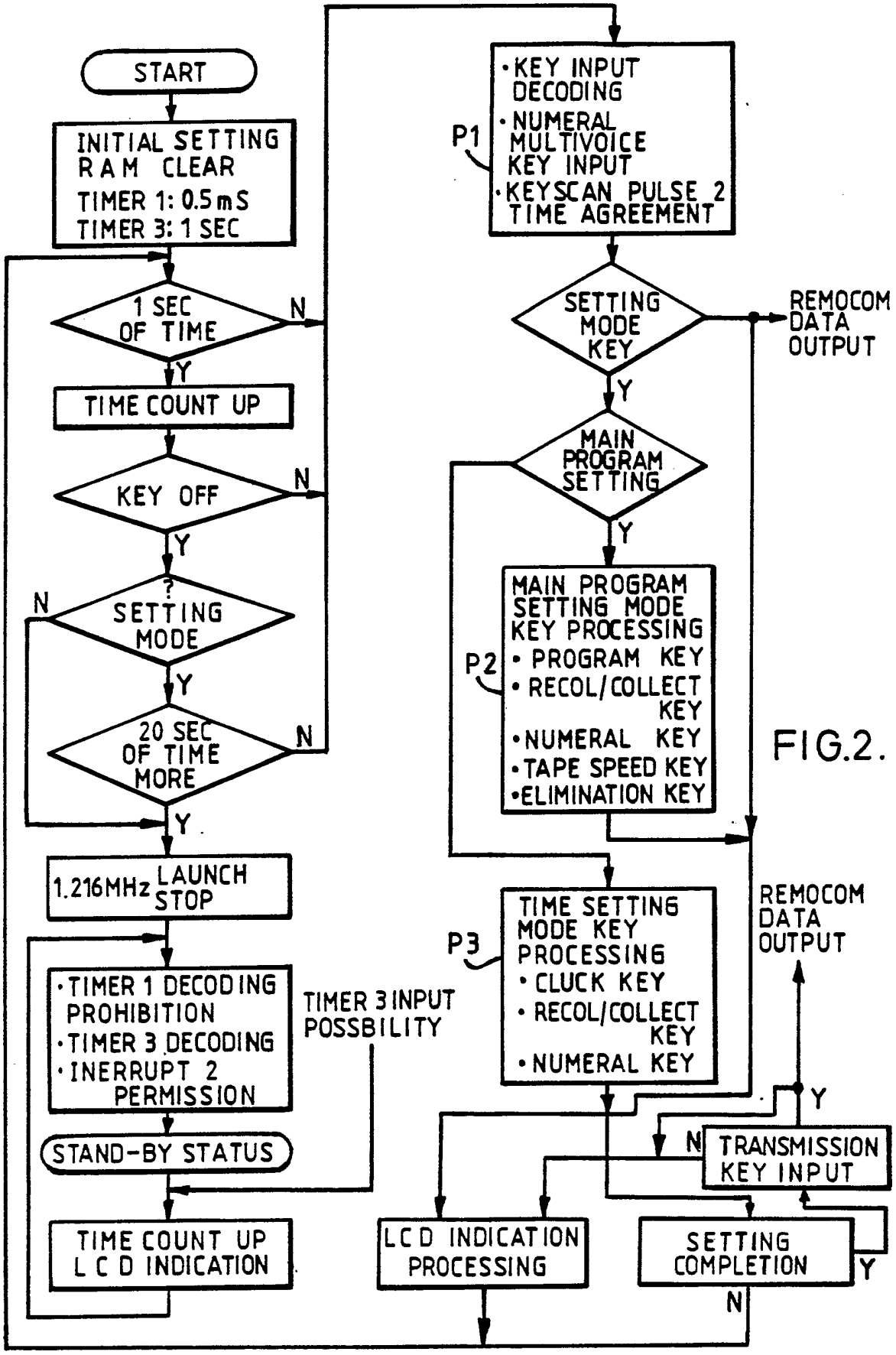

START
INITIAL SETTING
RAM CLEAR
TIMER 1: 0.5mS
TIMER 3: 1 SEC
1 SEC OF TIME
N
Y
TIME COUNT UP
KEY OFF
N
Y
SETTING MODE
N
Y
20 SEC OF TIME MORE
N
Y
1.216MHz LAUNCH STOP
·TIMER 1 DECODING PROHIBITION
·TIMER 3 DECODING
·INERRUPT 2 PERMISSION
STAND-BY STATUS
TIMER 3 INPUT POSSBILITY
TIME COUNT UP
L C D INDICATION
·KEY INPUT DECODING
·NUMERAL MULTIVOICE KEY INPUT
·KEYSCAN PULSE 2 TIME AGREEMENT
P1
SETTING MODE KEY
REMOCOM DATA OUTPUT
Y
MAIN PROGRAM SETTING
Y
MAIN PROGRAM SETTING MODE KEY PROCESSING
P2
• PROGRAM KEY
• RECOL/COLLECT KEY
•NUMERAL KEY
•TAPE SPEED KEY
•ELIMINATION KEY
TIME SETTING MODE KEY PROCESSING
P3
• CLUCK KEY
• RECOL/COLLECT KEY
• NUMERAL KEY
REMOCOM DATA OUTPUT
Y
N
TRANSMISSION KEY INPUT
L C D INDICATION PROCESSING
SETTING COMPLETION
Y
N

FIG.2.

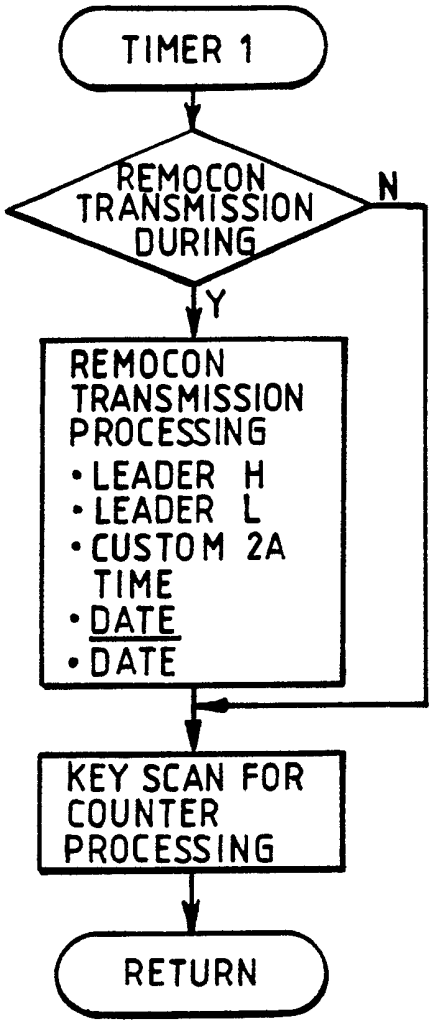


FIG.3.

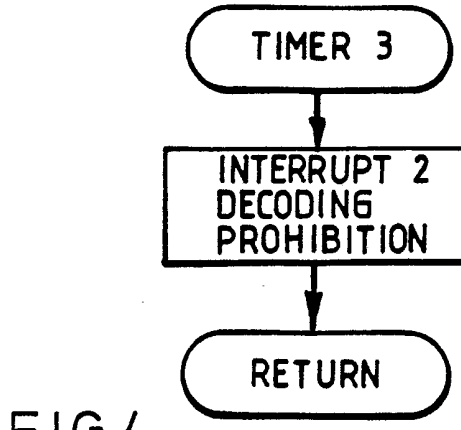


FIG.4.

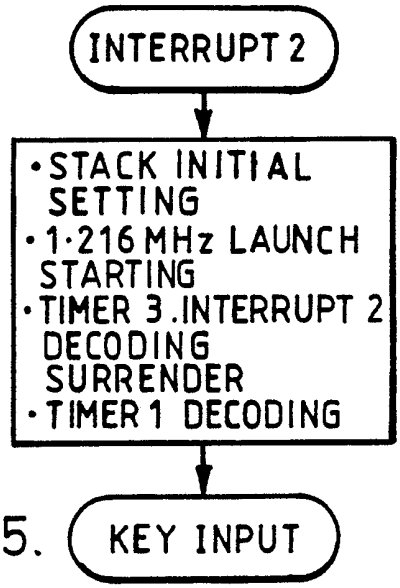


FIG.5.

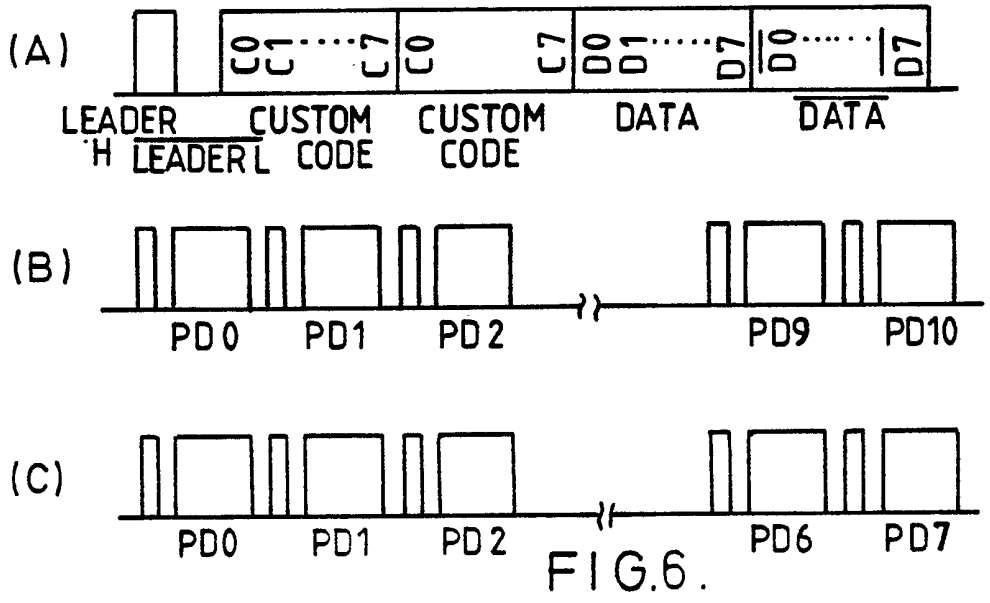


FIG.6.

APPARATUS AND METHOD FOR REMOTE CONTROL PROGRAMMING OF A VIDEO RECORDER

The present invention relates to an apparatus and method for remote control programming of a video recorder, such as a VTR (Video Tape Recorder). In this context, programming means selection of the channel which is to be recorded together with the time at which recording is to commence and the duration or time at which recording is to cease.

In the past, in order to program a VTR, first the VTR set is turned on and subsequently the user selects the channel and time settings; by manually operating controls on the VTR while monitoring the setting by a small display screen built into the VTR.

The direct operation of the VTR controls can be inconvenient and sometimes the VTR is not correctly programmed in accordance with the user's wishes.

The present invention seeks to provide an improved arrangement.

According to the present invention there is provided apparatus for selecting a channel and time for recordal

of information by a video recorder, comprising a remote control unit having a key matrix, a processor and a display, channel and time data being selected using the key matrix and processor, with display of the selected data upon the said display and subsequent transmission of the data to the video recorder.

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

Fig. 1 is a block diagram of an apparatus according to one embodiment of the present invention,

Fig. 2 is a flow chart which illustrates the operation of the apparatus shown in figure 1,

Figs. 3-5 are subroutines of the flow chart of figure 2, and

Fig. 6 illustrates the form of the data transmitted by the apparatus of figure 1.

Figure 1 is a block diagram of a remote control unit (referred to in the drawings as a remocon) which forms an embodiment of the present invention. As will be immediately apparent from figure 1, unlike conventional

remote control units that of figure 1 includes includes a liquid crystal display (LCD).

The remote control unit of figure 1 comprises a MICOM 2, the LCD 3, a key matrix 1 and two oscillators, Z1 and Z2. Oscillators Z1 and Z2 have oscillating frequencies of 1.215MHz and 32.768KHz, respectively. Key matrix 1 is used to control the MICOM 2 and the LCD 3 displays data in accordance with the operation of the MICOM 2.

The desired channel and recording times are established by pressing appropriate keys on the key matrix 1, using the LCD 3 of the remote control unit to monitor this programming operation. Once the required data has been established, the data is transmitted from the remote control unit to the VTR, thereby programming the VTR for recordal.

The detailed operation of the remote control unit, and particularly of the MICOM 2 thereof, will now be described with reference to figure 2, which is a flow chart.

When the initial operation of the remote control unit commences, the RAM inside the MICOM 2 is cleared and subroutine "Timer 1" and "Timer 3" have their respective periods set to 0.5 msec and 1 sec. Thus initially, the

period of timer 1, 0.5ms, is derived from oscillator Z1 (which has a frequency of 1.215MHz) and that of timer 3, 1 sec, is derived from oscillator Z2 (which has a frequency of 32.768KHz).

If a key in the key matrix 1 is pressed within 1 second after clearing of the RAM is complete, a decoding routine P1 is performed to decode the key input. If more than 1 second elapses a time count-up rountine is performed. After the time count-up routine is performed, a test is performed to establish whether or not a function key of the key matrix 1 is switched ON. If it is established that the function ket is switched ON, the decoding routine P1 is performed. If it is established that the function key is switched OFF, a test is undertaken to determine whether or not a programming or setting mode has been selected.

If it is established that the setting mode has been selected, a test is conducted to determine whether more than 20 seconds elapse after the last key-input. If the setting mode is not selected, processing proceeds directly to the oscillation stop routine for oscillator Z1.

When less than 20 seconds elapse after the last key-input, the key-input decoding routine P1 is

performed until 20 seconds do elapse after the last key-input. When this condition finally occurs, the oscillation stop routine for oscillator Z1 is performed.

The key-input decoding rountine P1 is described hereinbelow.

If the setting mode is not selected, the processing enters a stand-by loop in which a time count-up occurs and an indication thereof is displayed by LCD 3.

Prior to entering the stand-by loop, oscillation of oscillate Z1 is stopped in the loop itself, decoding for timer 1 is stopped and decoding for another timer, timer 3, is performed. Also, the loop allows for an interrupt 2 to be performed and allows for a timer 3 input.

The specific sequence of steps in the loop are, firstly, stop decoding for timer 1, enable decoding for timer 3 and allow for the occurance of interrupt 2. Next, the loop enters the standby state itself, in which the input status of timer 3 is checked. If there is an input from timer 3 a subroutine is performed. If there is no input from timer 3, a time count-up is displayed by LCD 3. The loop is then repeated.

The interrupt 2 subroutine as shown in Figure 5. If this subroutine is performed, the oscillator Z1 recommences operation and the subroutine "Timer 1", as shown in Figure 3, is performed. Subroutine "Timer 1" determines whether or not programmed recordal data is ready for transmission to the VTR. The form of the programmed recordal data, sent by the remote control unit to the VTR, is shown in Figure 6. After transmission, or directly if no transmission is appropriate, a counter for key-scanning is operated. LCD 3 of the remote control unit displays the counted time.

The operation of the key-input decoding rountine P1 will now be described. In the key-input decoding routine P1, the key-input, whether a conventional number key or a special key such as a sound multiselection key, is checked by decoding the key-input. This check of the key-input is completed when a repeat of the key-scan pulse is received.

After the key-input has been decoded in the key-input decoding routine P1, a test is carried out to determine whether the key-input is associated with the setting mode or not. If the key-input is associated with the setting mode, the processing proceeds to check whether the key-input is associated with the channel setting

mode.

However, if the key-input is not associated with the setting mode, then the key-input is the conventional key-input and the remote control data is sent ot the VTR in the normal manner. That is, if the key-input, as decoded in the key-input decoding routine P1, does not indicate operation of the setting mode key but, rather, operation of a conventional function key, the key-input is sent direct to the VTR so that the corresponding operation is performed.

If the setting mode key is selected, either the channel setting mode or the time setting mode has subsequently to be selected. When the channel setting mode is selected,the channel setting routine P2 is performed. When the time setting mode is selected, the time setting routine P3 is performed.

In the channel setting routine P2, the required channel can be established by receiving a key-input by operation of the channel key, the recall/correct key for reset and correction, the number key, the speed key for the tape, and the removal key. The channel selection resulting from the key-inputs is displayed by the LCD 3.

In the time setting routine P3, the required time is

established using the clock key, the number key, and the recall/correct key. The time setting operation is displayed by the LCD 3.

In both the channel setting routine P2 and the time setting routine P3, progress of the selection is displayed by LCD 3 and there is a test to determine whether the selectin has been completed or not. If the channel and time selections have not been completed,the above described processing is repeated.

When both the channel and time for recording have been selected, the processing monitors the transmission key, such that the selected data is sent to the VTR when the transmission key is pressed. LCD 3 displays the channel and time selection prior to operation of the transmission key.

The form of the channel and time selectin data as sent to the VTR by the remote control unit, in the manner described above, is different to the form of the data which is conventionally transmitted by the remote control unit. The special data form used for transmission of the channel and time selection information is shown in Figure 6.

That is, the data transmitted for a conventional

function key has the form shown in figure 6(a), and the data transmitted for the channel and time recordal information have the forms shown in figure 6(b) and (c), respectively. In comparison with the conventional data format of figure 6(a), which can be considered as one group of signals, the channel and time recordal data format comprises many groups of signals. Each group of signals in the channel and time recordal data format can be varied in accordance with the selection made and the individual groups of signals may correspond to signals used for conventional function keys.

As described above, the present invention provides means by which the channel and times for recordal can be selected both simply and conveniently - using a remote control unit which has its own display device.

The invention is not limited to the embodiment described hereinabove. Various modifications of the embodiment as well as other embodiments of the invention will become apparent to persons skilled in the art upon reference to the above description. All such modifications and embodiments fall within the scope of the invention.

CLAIMS

1. Apparatus for selecting a channel and time for recordal of information by a video recorder, comprising a remote control unit having a key matrix, a processor and a display, channel and time data being selected using the key matrix and processor with display of the selected data upon the said display and subsequent transmission of the data to the video recorder.

2. Apparatus as claimed in claim 1, comprising two oscillators which have respective and different frequencies.

3. A method of selecting a channel and time for information recordal by a video recorder, comprising the steps of :-

providing a remote control unit which incorporates a display for displaying a channel and time selection made using the key matrix and processor of the unit,

making a channel and time selection using the said key matrix and processor, and

transmitting the said selection to the video recorder subsequent to display of the selection by the said display.

4. A method as claimed in claim 3, comprising the step

of arranging for transmission of the said selection to the video recorder by way of a plurality of discrete groups of signals rather than by way of a single continuous stream of signals.

5. A method as claimed in claim 4, wherein the plurality of discrete groups of signals are substantially arranged in the form indicated in figures 6(b) and 6(c) of the accompanying drawings.

6. A method as claimed in any of claims 3 to 5, comprising the step of arranging for the said processor to operate substantially in accordance with figures 2 to 5 of the accompanying drawings.

7. Apparatus for selecting a channel and time for recordal of information by a video recorder, substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

8. A method for establishing the program and time of the remocon having remocon MICOM 1, characterised in that the time counting operation is performed being displayed the LCD 3 under the conditions that the initial time establishment is t1 second, the functional key is OFF and the time more than t2 seconds goes by after the mode key in ON, while not under said conditions, the

conventional key input is sent as the remocon data after decoding of the key input, and the mode key input is sent to the set as remocon data for mode-set after displayed on the LCD 3 through the establishing route of each program and time.

9. A method according to claim 8 wherein the data output of the remocon for establishing the main program and time consits of many groups by regarding the data output of the conventional functional key as one group, and the custom code is identically used.

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