

CHANNEL SELECTION

The present invention relates to channel selection in a broadcasting signal receiving device, and more particularly to the selection of a
5 broadcasting channel which is desired to be viewed, using a video program system (or service, and hereinafter referred to as VPS) function.

Generally speaking, a broadcasting signal receiving device includes a television receiver, an audio and/or video cassette recorder provided with a
10 tuner, etc. If a channel is selected in the tuner from the information sent from the broadcasting station, these broadcasting signal receivable devices display the information of the selected channel, so that a user can watch it. The VPS function is mainly used in a video tape recorder provided with a tuner, and particularly is used to control the record mode during preprogrammed
15 recording. That is, as shown in Figure 1A of the accompanying diagrammatic drawings, a VPS uses digitally coded information to load and send information with respect to the program transmitted from the broadcasting station onto a predetermined region of the television signal. This information is sent through the 16th line in the empty region except the region where a
20 vertical synchronizing signal and a video signal (a portion displayed in a display unit) are loaded on the broadcasting signal which is sent in units of one field. The total transmittal information consists of 15 words which comprise data to recognize the transmission source (the broadcasting station), the program starting and ending times, record mode pauses, the program
25 service and title, etc. Particularly, as shown in Figure 1B of the accompanying diagrammatic drawings, before a VPS code is supplied, an initial test signal (ITS) is output to inform a user in advance that a video program function will be performed. After the VPS code is generated,

teletext (TTX) information is supplied. Actually, the ITS, VPS, and TTX data are all included in the region which can carry teletext information.

The VPS information is used as predetermined information between the
5 broadcasting station and the receiving end. Accordingly, if VPS information
is sent from the broadcasting station, a VPS decoder decodes the supplied
VPS code to distinguish the program and outputs a data type to be recognized
by a system controller within the set. The system controller compares
recording data of a program to be recorded, which was previously stored by
10 a user, with data supplied from the VPS decoder. If there is a match, the
system controller controls the deck to perform the record mode. As described
above, since preprogrammed recording is controlled by the VPS code sent
from the broadcasting station, even if the broadcasting time of program
changes due to peculiar conditions at the broadcasting station, a VPS function
15 offers the advantage of flexibly controlling the recording. However, using the
VPS function, the direct selection of the viewing channel is impossible under
current methods.

Accordingly, preferred embodiments of the present invention aim to
20 provide a method for selecting a channel to be watched using a VPS function.

It is another aim to provide a channel selecting method for programs
of the same category, using the VPS function, which classifies the programs
received from the broadcasting station into similarly-typed programs, assigns
25 user-designated channels according to the types, and selects the channel of
desired programs.

It is still another aim to provide a channel selecting method for programs of the same category, which selects the desired channel by displaying corresponding video information of the broadcasting station transmitting like programs, using a PIP (picture-in-picture) function.

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It is yet another aim to provide a channel selecting method for programs of the same category, for displaying channel information of the broadcasting station transmitting like programs, using an OSD (on-screen-display) function.

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According to one aspect of the present invention, there is provided a channel selecting method for programs of the same category in a broadcasting signal receiving device having a VPS decoder for decoding a video program system (VPS) code included in a video signal detected from a received broadcasting signal and showing at least a program starting time, a system controller for recognizing the information decoded in said VPS decoder, and display means for displaying said video signal under the control of said system controller, said method comprising the steps of:

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classifying the decoded information into similar-type programs when the information decoded in said VPS decoder is supplied to said system controller;

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making the broadcast channels of the programs classified in said program category classifying step correspond to predetermined channels arbitrarily set in said system controller;

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first selecting a channel corresponding to the desired program category from said predetermined channels;

5 displaying information about the broadcast channels corresponding to the channel selected in said first channel selection step through said display means; and

second selecting a broadcast channel by determining which broadcast channel is desired to be viewed through said displaying step.

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Preferably, said displaying step comprises displaying said information about the broadcast channels as an on-screen-display.

15 A channel selecting method as above may further comprise the step of recognizing a normal broadcasting mode in said system controller and allowing direct control of said broadcast channel by the user, when said VPS code is not included in said video signal.

20 A channel selecting method as above may further comprise the steps of:

25 selecting said broadcast channel from among the predetermined channels selected in said first channel selection step while said broadcast channel selected by said second channel selection step is viewed; and

selecting a predetermined channel different from the predetermined channel selected in said first channel selection step.

Preferably, said broadcasting signal receiving device comprises at least one tuner for receiving a broadcasting signal through an antenna, and said displaying step comprises displaying video information about said broadcast channels corresponding to the channel selected in said first channel selection step onto a screen having at least one subscreen through said display means by controlling a channel selecting operation of said tuner by said system controller.

The invention extends to a video signal display device adapted to operate in accordance with a method according to any of the preceding aspects of the invention.

According to another aspect of the present invention, there is provided a video signal display system comprising:

a VPS decoder for decoding a video program system (VPS) code included in an input video signal;

a system controller for recognizing information decoded in said VPS decoder;

display means for displaying said video signal under the control of said system controller;

means for selecting a category of programs; and

means for displaying on said display means, under control of said system controller, information about a plurality of received video signals which are designated by respective VPS codes as within the selected category.

- 5 In preferred embodiments of the present invention, in a displaying step, in order for a user to be capable of selecting a broadcast channel, the desired channel to be viewed can be selected through a displayed main screen or subscreen by displaying on the subscreen at least one of the video signals of the broadcasting station transmitting the same type of program, or the desired
- 10 channel to be viewed can be selected by displaying the broadcast channel information from a broadcasting station transmitting the same type of program as a character information type.

- A channel selecting method for programs of the same category may
- 15 detect a program using a VPS code for detecting at least the starting time information with respect to the program transmitted from the broadcasting station, and if the channel of the source (the broadcasting station) transmitting the detected programs is made to correspond to an arbitrary channel, the user can recognize the channels of the broadcasting station transmitting the same
- 20 type of program through an arbitrary channel selection and can easily select the desired channel of the recognized channels.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings, in which:

5 Figures 1A and 1B show television signals including video program system (VPS) data, as mentioned above;

Figure 2 is a block diagram of one example of a device according to the present invention; and

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Figure 3 is a flowchart of one example of a method for selecting channels of the same program category.

Figure 2 is a block diagram of a device for embodying a channel selecting method for programs of the same category, which is applied to a device having the capability of receiving a broadcasting signal.

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The broadcasting station should assign program codes according to various broadcasting program categories. For instance, the character "A" may be assigned to amusement programs, the character "B" to sportscasts, and the character "C" to serial dramas, and encoded onto the video signal output through the 16th region shown in Figure 1A.

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The device of Figure 2 comprises an antenna 1 for receiving a video signal output from a broadcasting station, first and second tuners 2 and 6 for detecting the video signal received through the antenna 1, a VPS decoder 3 for detecting and decoding a VPS code from the video signal output from first tuner 2, a TTX generator 7 for detecting and generating a TTX code from the

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video signal output from first tuner 2, a system controller 4 for recognizing and temporarily storing the conditions (for instance, as mentioned above, the program's starting and ending times, its title, etc.) of the program sent from the broadcasting station according to the information output from VPS decoder 3 and TTX generator 7 and then controlling the channel selecting operation of first and second tuners 2 and 6 according to the supplied control information, a channel selector 5 for selecting a user-designated desired channel and a broadcast channel according to the user's control order and information, a PIP processor 8 for PIP (Picture-In-Picture) processing to display the signal output from second tuner 6 on a subscreen, a first selection switch SW1 for selectively outputting the signal output from first tuner 2 and PIP processor 8 under the control of system controller 4, a video signal processor 9 for amplifying the signal output from first selection switch SW1 by an intermediate frequency and detecting the video signal, a second selection switch SW2 for selectively outputting the signals output from video signal processor 9 and TTX generator 7 under the control of system controller 4, and a displaying means 10 for displaying the signal output from second selection switch SW2.

Here, programs of the same category are programs of the same type, i.e. programs of a similar category among transmitted programs from every broadcasting station. Also, an arbitrary channel is one which broadcasts similar programs mentioned above and can be set by the user. For instance, if channel 1 is set as a sports channel, all sports programs can be displayed by the selection of channel 1. Here, setting the arbitrary channels is performed for those channels other than the inherent channels of existing broadcasting stations, and the broadcast channels are the inherent channels of the broadcasting station.

Figure 3 is a flowchart illustrating an example of a method for selecting the channels of like programs. An embodiment of the present invention will be described with reference to Figures 2 and 3.

5 When information sent from the broadcasting station is supplied through antenna 1, it is output to VPS decoder 3 through first tuner 2. At this time, if the VPS code is not present, the coding information is not supplied to system controller 4, which thus recognizes a normal broadcasting mode (step 101). Accordingly, normal broadcasting is carried out (step 102).

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 However, when the received broadcast is a VPS broadcasting signal, VPS decoder 3 performs a decoding operation and supplies data to system controller 4. Using information supplied from VPS decoder 3, system controller 4 checks for the presence of a code which can recognize the category of the program (step 103). If the codes which can discriminate the program category are not supplied, the normal VPS function (the preprogrammed recording function) is performed (step 104). Contrarily, when the codes which can discriminate program type are present, system controller 4 checks whether a user-designated arbitrary channel is set (step 105). If the channel is not set, channel selector 5 assigns an arbitrary channel according to category (step 106). If an user-designated channel has been assigned and the program category code is present, the user-designated channel corresponds to the channels from respective sources (the broadcasting station) transmitting the program in the category matched to the user-designated channel (step 107).

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 When the user selects an arbitrary channel of the desired category to be viewed through channel selector 5 (step 108), the broadcasting channel

information of the broadcasting stations corresponding to the selected arbitrary channel are displayed (step 109). At this time, the broadcasting channel information can be displayed on displaying means 10 by generating a channel number through TTX generator 7, or by overlapping the video signal output from first tuner 2 with the output signal of second tuner 6 by controlling the first and second tuners 2 and 6 to select the corresponding broadcasting channel to thereby compress the signal output from second tuner 6 via PIP processor 8. Here, TTX generator 7 detects and decodes the TTX information transmitted on the region of the signal which carries the TTX information as described above in connection with Figure 1B and then generates the character corresponding to the decoded information through a character information generator (or OSD circuit) (not shown). The TTX information exists even between the ITS and VPS information regions. Also, as is well known in the art, PIP processor 8 processes the subscreen which will be inserted, so as to insert a subscreen consisting of one frame in a predetermined region of the screen.

If the user recognizes the channel information of the respective broadcasting stations transmitting the same types of programs by the above-described method and selects one broadcasting channel desired to be watched (step 110), the video signal of the desired broadcasting channel is output to display means 10 through first tuner 2 and first control switch SW1 (step 111).

During viewing, if channel selection control information is supplied through channel selector 5, it is determined whether the supplied control information is broadcasting channel information of a program of the same category, or whether it is arbitrary channel selecting information for selecting

another type of program. Then, steps 110 and 111 are again carried out in the former case (step 112), or, for the latter case steps 108 and 109 are carried out again (step 113).

5 When transmission of the program which is being viewed ends (step 114), it is checked whether another program of the selected category is being transmitted (step 115), and if so, its corresponding broadcasting channel is displayed, allowing the user to recognize it (step 116). Then, steps 110 to 115 are repeated. However, if such a program does not exist in step 115, it
10 is checked whether the user's control information to change the broadcasting mode to normal is supplied. If it is, step 102 is performed, and if not, the operation ends (step 117).

15 The above described embodiment of the present invention classifies the programs sent from the broadcasting station into similar-typed programs using a VPS function, assigns them as user-designated channels and automatically detects information from sources transmitting the same type of program according to the user-designated channel selection, so that a desired channel may be easily selected in a program category. Moreover, with the illustrated
20 embodiment of the present invention, it is now unnecessary to scan every channel to select a desired program to be viewed.



CLAIMS

1. A channel selecting method for programs of the same category in a broadcasting signal receiving device having a VPS decoder for decoding a video program system (VPS) code included in a video signal detected from a received broadcasting signal and showing at least a program starting time, a system controller for recognizing the information decoded in said VPS decoder, and display means for displaying said video signal under the control of said system controller, said method comprising the steps of:
 - 5 classifying the decoded information into similar-type programs when the information decoded in said VPS decoder is supplied to said system controller;
 - 15 making the broadcast channels of the programs classified in said program category classifying step correspond to predetermined channels arbitrarily set in said system controller;
 - 20 first selecting a channel corresponding to the desired program category from said predetermined channels;
 - 25 displaying information about the broadcast channels corresponding to the channel selected in said first channel selection step through said display means; and
 - second selecting a broadcast channel by determining which broadcast channel is desired to be viewed through said displaying step.



2. A channel selecting method as claimed in claim 1, wherein said displaying step comprises displaying said information about the broadcast channels as an on-screen-display.
- 5 3. A channel selecting method as claimed in claim 1 or 2, further comprising the step of recognizing a normal broadcasting mode in said system controller and allowing direct control of said broadcast channel by the user, when said VPS code is not included in said video signal.
- 10 4. A channel selecting method as claimed in claim 1, 2 or 3, further comprising the steps of:
- selecting said broadcast channel from among the predetermined channels selected in said first channel selection step while said broadcast
- 15 channel selected by said second channel selection step is viewed; and
- selecting a predetermined channel different from the predetermined channel selected in said first channel selection step.
- 20 5. A channel selecting method according to any of the preceding claims, wherein said broadcasting signal receiving device comprises at least one tuner for receiving a broadcasting signal through an antenna, and said displaying step comprises displaying video information about said broadcast channels
- 25 corresponding to the channel selected in said first channel selection step onto a screen having at least one subscreen through said display means by controlling a channel selecting operation of said tuner by said system controller.



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6. A channel selecting method substantially as hereinbefore described with reference to the accompanying drawings.

7. A video signal display device adapted to operate in accordance with a method according to any of the preceding claims.

8. A video signal display system comprising:

a VPS decoder for decoding a video program system (VPS) code included in an input video signal;

a system controller for recognizing information decoded in said VPS decoder;

display means for displaying said video signal under the control of said system controller;

means for selecting a category of programs; and

means for displaying on said display means, under control of said system controller, information about a plurality of received video signals which are designated by respective VPS codes as within the selected category.

9. A video signal display system substantially as hereinbefore described with reference to the accompanying drawings.
