

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 April 2004 (22.04.2004)

PCT

(10) International Publication Number
WO 2004/034350 A1

(51) International Patent Classification⁷: **G08B 27/00**

(21) International Application Number:
PCT/KR2003/002080

(22) International Filing Date: 9 October 2003 (09.10.2003)

(25) Filing Language: Korean

(26) Publication Language: English

(30) Priority Data:
10-2002-0061607 9 October 2002 (09.10.2002) KR

(71) Applicant and

(72) Inventor: **KIM, Chang-Eui** [KR/KR]; 2-C Jangmi Apt.,
302-64, Ichon-1-Dong, Yongsan-Gu, Seoul 140-031 (KR).

(74) Agent: **L & K PATENT FIRM**; 701, Daekun Bldg.,
822-5, Yeoksam-Dong, Kangnam-Gu, Seoul 135-080
(KR).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE,
GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

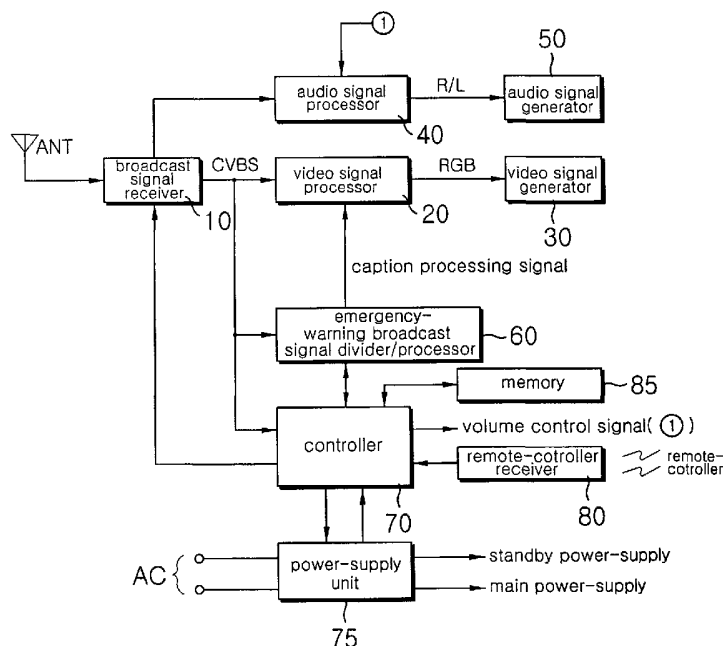
(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: TELEVISION SET AND METHOD FOR NOTIFYING A DISASTER SITUATION



(57) Abstract: An emergency broadcast television system and method for propagating an emergency broadcast signal. The method for propagating the emergency-warning broadcast signal in a television (TV) system includes steps of a) receiving a broadcast signal or broadcast data, b) detecting an emergency-warning broadcast signal or emergency broadcast data being overlapped with or inserted in the received broadcast signal or the received broadcast data, and c) if predetermined registration information is detected from among the detected emergency-warning broadcast signal or the detected emergency-warning broadcast data, powering on a main power-supply unit of the TV system.

TELEVISION SET AND METHOD FOR NOTIFYING A DISASTER SITUATION

Technical Field

The present invention relates to a television system serving as a broadcast signal receiver, and more particularly to an emergency-warning broadcast television system for propagating emergency-warning broadcast signals, and a method for propagating emergency-warning broadcast signals using the same emergency-warning broadcast television system.

Background Art

Typically, a voice notification system for transmitting a message indicative of a disaster situation from a government and public office (e.g., a ward or district office) to individual houses using a telephone or a mobile phone has been widely used as a current universal emergency situation notification method. However, this voice notification system has a disadvantage in that it consumes a long propagation time, resulting in an ineffective system. In order to solve this problem of the above-identified voice notification system, there has been newly proposed an automatic emergency-warning broadcast system using a television system.

Disclosure of the Invention

Therefore, the present invention has been made in view of the above problems, and it is an object of the present invention to provide a television system for propagating emergency-warning broadcast signals to individual houses on the condition that the occurrence of a disaster or calamity has been expected, and a method for propagating emergency-warning broadcast signals for use in the same television system.

It is another object of the present invention to provide a television system for enabling a user to view and listen to an emergency-warning broadcast program even though it has been powered off, and a method for propagating emergency-warning broadcast signals for use in the same television system.

It is yet another object of the present invention to provide an emergency-warning broadcast television system for quickly broadcasting an emergency-warning broadcast program indicative of a disaster situation to a TV viewer who views video data reproduced by a video player (e.g., a VCR), and a method for propagating emergency-warning broadcast signals for use in the same television system.

In accordance with one aspect of the present

invention, the above and other objects can be accomplished by the provision of a method for propagating an emergency-warning broadcast signal in a television (TV) system, comprising the steps of: a) receiving a broadcast signal or broadcast data; b) detecting an emergency-warning broadcast signal or emergency-warning broadcast data being overlapped with or inserted in the received broadcast signal or the received broadcast data; and c) if predetermined registration information is detected from among the detected emergency-warning broadcast signal or the detected emergency-warning broadcast data, powering on a main power-supply unit of the TV system.

Therefore, although the TV system is powered off, it can be automatically powered on when receiving an emergency-warning broadcast signal, such that people who live in a disaster area can view and listen to an emergency-warning broadcast program configured in the form of caption or newsflash data via the automatically-driven TV system.

In accordance with another aspect of the present invention, there is provided a television (TV) apparatus for propagating an emergency-warning broadcast signal, comprising: an emergency-warning broadcast signal divider/processor for separating an emergency-warning broadcast signal or emergency-warning broadcast data being overlapped with or inserted in reception broadcast signal or

data from overall reception information, decoding the separated signal or data with emergency-warning broadcast control information, and outputting the decoded result; and a controller for either powering on a main power-supply unit of the TV apparatus or switching a system operation mode to a TV viewing mode when predetermined registration information is detected from among the decoded emergency-warning broadcast control information, and displaying a broadcast signal or data of a predetermined emergency-warning broadcast channel in the form of AV (Audio and Video) data.

Preferably, the controller selects a channel of a broadcast signal receiver in order to receive a broadcast signal of a predetermined emergency-warning broadcast channel in a power-supply standby mode and a video play mode.

Therefore, if an emergency-warning broadcast signal is transmitted from the predetermined broadcast channel while a user views video data reproduced by an external device such as a VCR, the TV system displays the received emergency-warning broadcast signal received via a broadcast signal receiver, such that the user who views data provided from the external device can quickly view and listen to an emergency-warning broadcast program configured in the form of caption or newsflash data.

Brief Description of the Drawings

The above and other objects, features and other advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

Fig. 1 is an exemplary view illustrating TV emergency-warning broadcast control codes in accordance with a preferred embodiment of the present invention;

Fig. 2 is a block diagram illustrating a TV system for the purpose of an emergency-warning broadcast in accordance with a preferred embodiment of the present invention;

Fig. 3 is a flow chart illustrating operations for use in the TV system in accordance with preferred embodiments of the present invention;

Fig. 4 is a block diagram illustrating a TV system for the purpose of an emergency-warning broadcast in accordance with another preferred embodiment of the present invention;

Fig. 5 is a block diagram illustrating a TV system for the purpose of an emergency-warning broadcast in accordance with yet another preferred embodiment of the present invention;

Fig. 6 is a block diagram illustrating a TV system for the purpose of digital emergency-warning broadcast in

accordance with yet another preferred embodiment of the present invention; and

Fig. 7 is a block diagram illustrating a TV system for the purpose of digital emergency-warning broadcast in accordance with yet another preferred embodiment of the present invention.

Best Mode for Carrying Out the Invention

Now, preferred embodiments of the present invention will be described in detail with reference to the annexed drawings. In the drawings, the same or similar elements are denoted by the same reference numerals even though they are depicted in different drawings. In the following description, a detailed description of known functions and configurations incorporated herein will be omitted when it may make the subject matter of the present invention rather unclear.

Prior to describing the present invention, it should be noted that the broadcasting station must transmit either a predetermined emergency-warning broadcast signal or predetermined emergency-warning broadcast data previously determined by a broadcasting station in such a way that an emergency-warning broadcast operation can be executed using the TV set. The emergency-warning broadcast signal or data to be transferred from the broadcasting station is composed of

TV system control codes for the emergency-warning broadcast operation. The TV system control codes are encoded by an encoder, are overlapped with or inserted into a VBI (Vertical Blanking Interval) period of a broadcast signal, and are then propagated. Examples of such TV system control codes for the emergency-warning broadcast system are shown in Fig. 1.

Referring to Fig. 1, TV emergency-warning broadcast start information indicates a start time of the TV emergency-warning broadcast. If the TV emergency-warning broadcast start information is detected, it is determined that the emergency-warning broadcast signals are currently propagated. The emergency-warning broadcast transmission time information indicates a transmission time of the emergency-warning broadcast. This transmission time information is compared with current time information (RTC), and is thereby adapted to power the system on or off. The emergency-warning duration time information indicates a duration time of the emergency-warning broadcast. Information indicative of the number of emergency-warning broadcast reception areas indicates the number of emergency-warning broadcast propagation areas. In more detail, N reception area values indicate the number of predetermined regions where the emergency-warning broadcast signal must be propagated. If either one of the N reception area values is equal to its own regional value stored in the system, the emergency-warning broadcast system determines

whether the above area is a disaster area in such a way that the TV system can be controlled.

Emergency-warning broadcast reception group information is adapted to notify the police, the military personnel, and public service personnel, etc. If necessary, the emergency-warning broadcast reception group information may also be adapted to propagate not only the emergency-warning broadcast but also various other information. Caption start information of the emergency-warning broadcast is adapted to indicate a caption start operation of the emergency-warning broadcast. Emergency-warning broadcast caption information, emergency-warning broadcast caption termination command information, and emergency-warning broadcast termination command information are sequentially positioned at the rear of the above emergency-warning broadcast caption start information.

A test code can be inserted between the emergency-warning broadcast start information and the emergency-warning broadcast transmission time information. This test code is a control code needed for pre-testing the TV system while propagating the emergency-warning broadcast in such a way that the TV system can be normally controlled. The test code may also be composed of various information, for example, TV-on code information, test code transmission time information, group recognition code information, genre recognition code information, region recognition code information, and TV-off

code information, etc. If the TV system receives a test code, a system controller stores the received test code in its own inner memory. If the TV system receives a new code, it updates the stored code with a newly-received code.

5 In case of using the stored test codes, upon receiving a TV-on command from a user, the controller powers on a TV set using the stored TV-on code, and adjusts the volume of the TV set. The controller is switched to a prescribed emergency-warning broadcast channel, returns to a previous channel, and
10 displays various information, for example, stored signal, data transmission time, group recognition code, and reception rate information, etc., in the form of an OSD (On Screen Display). This test operation may be programmed to be executed only once after receiving and storing the above test code in a
15 predetermined place, or may also be programmed to be periodically executed.

 If necessary, genre recognition code information indicative of category information (e.g., a newsflash, news, and TV series, etc.) of propagated broadcast signals may also
20 be added to the control codes.

 Fig. 2 is a block diagram illustrating a TV system for the purpose of an emergency-warning broadcast in accordance with a preferred embodiment of the present invention.

 Referring to Fig. 2, a broadcast signal receiver 10
25 receives a predetermined selection broadcast signal upon

receiving a control signal from a controller 70, divides the received broadcast signal into a CVBS signal and an audio signal, and outputs the CVBS signal and the audio signals. The broadcast signal receiver 10 includes a general tuner
5 and an IF (Intermediate Frequency) processor as well known to those skilled in the art.

A video signal processor 20 processes the CVBS signal separated by the broadcast signal receiver 10 in the form of video signal components (i.e., RGB components) displayable
10 on a display, performs a predetermined mixing process with a caption processing signal, and outputs the mixing-processed result. The video signal processor 20 includes a Y/C divider for dividing the CVBS signal into Y and C signals, a chroma-signal processor for converting the divided Y/C signals into
15 RGB signals, and a video signal mixer for performing a mixing process on the caption processing signal.

The video signal generator 30 is adapted to display the RGB signals created from the video signal processor 20. The video signal generator 30 includes a CRT (Cathode Ray
20 Tube) driver and a CRT.

An audio signal processor 40 processes and outputs the audio signal separated by the broadcast signal receiver 10 in the form of predetermined R/L signals transmittable over a speaker. The audio signal processor 40 contains a
25 predetermined amplifier in its own output terminal. The

amplifier adjusts its own amplification level using a volume control signal ① created from the controller 70, such that the audio signal processor 40 can amplify the level of audible sound. An audio signal generator 50 serving as a speaker is connected to the output terminal of the audio signal processor 40, converts the R/L audio signals received from the audio signal processor 40 into audible sound signals, and outputs the audible sound signals.

A remote-controller receiver 80 receives a remote control signal transferred from a remote controller, and transmits the received remote control signal to the controller 70.

The emergency-warning broadcast signal divider/processor 60 separates an emergency-warning broadcast signal from the CVBS signal generated from the broadcast signal receiver 10, decodes the separated emergency-warning broadcast signal using emergency-warning broadcast control information, and outputs the decoded result to the controller 70. The emergency-warning broadcast signal divider/processor 60 generates caption processing signals (i.e., caption RGB signals) in response to caption information contained in the decoded emergency-warning broadcast control information, and outputs the caption processing signals to the video signal processor 20.

The controller 70 controls overall operations of the

TV system on the basis of control program data stored in a memory 85. For example, if specific information previously registered in the memory 85 (e.g., emergency-warning broadcast start information, reception area information, reception group information, or genre information, etc) is detected from among the decoded emergency-warning broadcast control information, the controller 70 powers on a power-supply unit of the TV system, or switches a system operation mode to a TV viewing mode, such that it can control the TV system to allow a broadcast signal for a prescribed emergency-warning broadcast channel to be displayed in the form of AV (Audio and Video) signals. If the emergency-warning broadcast start information having a registered pattern is detected, the controller 70 may activate a speaker, a buzzer, an emergency-warning lamp, and other emergency-warning devices, and may propagate such emergency-warning broadcast signals using the activated one.

For reference, a user may enter a regional code of his or her current location using a remote-controller. This regional code is stored in the memory 85, and is compared with the emergency-warning broadcast reception area information. Because individual broadcasting stations have different channels for every area, channel information of the broadcasting stations for propagating the emergency-warning broadcast signals may be stored in the memory using

a user's remote-controller. Therefore, provided that the controller 70 is programmed in advance to receive channel information of a broadcasting station that propagates an emergency-warning broadcast signal in a power standby mode,
5 the controller 70 controls the TV system to be powered on while propagating the emergency-warning broadcast program, such that most people can view and listen to the emergency-warning broadcast program.

The power-supply unit 75 receives an AC (Alternating
10 Current) power-supply voltage as an input, divides the received AC power-supply voltage into a standby power-supply voltage and a main power-supply voltage, and outputs the standby power-supply voltage and the main power-supply voltage. The standby power-supply voltage indicates a
15 minimum power-supply voltage needed for a system wakeup operation.

Fig. 3 is a flow chart illustrating operations for use in the TV system in a power-supply standby mode in accordance with preferred embodiments of the present
20 invention.

A method for propagating an emergency-warning broadcast signal in a TV system having a single tuner is classified into two methods, i.e., operations for use in a power-supply standby mode (also called a main power-supply
25 OFF mode), and other operations for use in a main power-

supply ON mode. The emergency-warning broadcast signal can be propagated in the power-supply standby mode on the assumption that a broadcast channel needed to propagate the emergency-warning broadcast signal has been previously selected or individual channels have been monitored in the power-supply standby mode.

The TV system's controller 70, that selects a channel transferring the emergency-warning broadcast signal, monitors individual channels, and is in the power-supply standby mode, determines whether an emergency-warning broadcast start code is detected using the emergency-warning broadcast signal divider/processor 60 at step I.

The controller 70 receives an emergency-warning broadcast signal shown in Fig. 1. The received emergency-warning broadcast signal is divided and processed in the emergency-warning broadcast signal divider/processor 60, and the divided and processed result is transmitted to the controller 70, such that the controller 70 detects the emergency-warning broadcast start code, and then receives emergency-warning broadcast control code information subsequent to the detected emergency-warning broadcast start code at step II.

The controller 70 receiving the emergency-warning broadcast control information determines whether a difference between emergency-warning broadcast transmission

time information and TV system's RTC (Real Time Clock) information is in the range of a predetermined allowable error at step III. If it is determined that the difference between the emergency-warning broadcast transmission time information and the TV system's RTC information is in the range of the predetermined allowable error at step III, the controller 70 determines whether the received emergency-warning broadcast reception area information contains specific information equal to area information registered in the memory 85 at step IV.

If it is determined at step IV that the received emergency-warning broadcast reception area information contains the same specific information as area information registered in the memory 85, the controller 70 powers on a system's main power-supply unit at step VI to provide system's individual components in a power-supply standby mode with an operation power-supply voltage. The reason why the power ON state is firstly checked at step V before powering on the system main power-supply unit at step VI is due to operations of a TV system having two tuners as shown in Fig. 5. In more detail, either one of the two tuners is a dedicated reception tuner needed to receive only emergency-warning broadcast signals. It is preferable for a TV system having the dedicated tuner to immediately select a prescribed emergency-warning broadcast channel on the basis

of the main power-supply ON state information, or it is preferable for the TV system to select such a prescribed channel after it has been powered on, such that the steps V and VI are adapted to determine whether the main power-supply unit is powered on.

Provided that the TV system contains only one tuner, the controller 70 powering on the system main power-supply unit at step VI outputs a volume control signal ① to increase a volume level at step VIII because the prescribed emergency-warning broadcast channel has been previously selected.

In this way, a TV is powered on upon receipt of a control signal from the controller 70 and then a volume level is increased. Caption processing signals decoded and processed by the emergency-warning broadcast signal divider/processor are mixed with an original video signal in the video signal processor (also called a data processor) 20, and the mixed result is created from the video signal processor 20.

The above-identified description has disclosed that a main power-supply unit of the TV system is powered on when various values are equal to each other, however, it should be noted that the main power-supply unit of the TV system can be powered on even in the case when only emergency-warning broadcast start information is detected from among

all the information stored in the memory, such that a variety of modifications can be applicable to a real TV system.

Although the above-identified description has disclosed a TV system having only one broadcast signal receiver, it should be noted that a variety of modifications are possible.

Fig. 4 is a block diagram illustrating a TV system that contains only one tuner and is connected to a video player such as a VCR.

Because the emergency-warning broadcast signal suddenly occurs while a user views desired data using his or her VCR, there must be newly proposed a method for propagating the emergency-warning broadcast signal to even the user who views data reproduced by the VCR.

As shown in Fig. 4, all the components other than the video and audio signal switching units 90 and 100 are the same as those of Fig. 2.

The video signal switching unit 90 selects either one of a video signal received from a video input terminal and a CVBS signal received from the broadcast signal receiver 10 according to a switching signal created from the controller 70.

The audio signal switching unit 100 selectively outputs either one of an audio signal received from an

external device via an audio input terminal and the other audio signal separated by the broadcast signal receiver 10 according to a control signal of the controller 70.

Therefore, if a video play mode is selected, the controller 70 controls the video signal switching unit 90 and the audio signal switching unit 100 to perform AV output operations of signals read by an external device such as a VCR. If a TV viewing mode is selected, the broadcast signal receiver 10 controls the switching units 90 and 100 such that the channel-selected TV broadcast signal is outputted via the audio and video signal generators 50 and 30.

If the video play mode is selected, the controller 70 controls the switching units 90 and 100 to output a signal read by the VCR via a speaker and a display. The controller 70 selects a broadcast channel transferring an emergency-warning broadcast signal to receive an emergency-warning broadcast program. If the broadcast channel is selected, the emergency-warning broadcast signal divider/processor 60 receives a broadcast signal overlapped with the emergency-warning broadcast signal from the broadcast signal receiver 10.

In the meantime, the controller 70 determines whether the emergency-warning broadcast signal divider/processor 60 has detected the emergency-warning broadcast start information. If the emergency-warning broadcast start

information has been detected, the controller 70 determines whether a difference between emergency-warning broadcast transmission time information and TV system's RTC information is in the range of a predetermined allowable error as previously stated in Fig. 3, and sequentially
5 examines whether the same area information as its own previously-stored area information is found in the received control information.

If the difference between the emergency-warning
10 broadcast transmission time information and the TV system's RTC information is in the range of a predetermined allowable error and the same area information as the above previously-stored area information is found in the received control information, the controller 70 switches a video play mode to
15 a TV viewing mode. In more detail, the controller 70 controls the video signal switching unit 90 and the audio signal switching unit 100 to output video and audio signals created from the broadcast signal receiver 10.

Because a current tuner is fixed to an emergency-
20 warning broadcast channel, AV signals received over the emergency-warning broadcast channel are displayed, and caption data indicative of the emergency-warning broadcast is mixing-processed by the video signal processor 20, such that a user who views data reproduced by a video player can
25 recognize that a disaster or calamity has occurred in his or

her residence area by visually viewing the caption data. In this case, the volume of the TV system can be automatically increased until reaching a predetermined volume level. Upon receiving a predetermined command from a user, the controller 70 may also be programmed to switch the TV viewing mode to the video play mode.

Fig. 5 is a block diagram illustrating a TV system having a dedicated emergency-warning broadcast tuner.

The TV system shown in Fig. 5 contains first and second broadcast signal receivers 10 and 15 whereas the aforementioned TV systems shown in Fig. 2 and 4 contain only one broadcast signal receiver 10. The TV system of Fig. 5 further includes one switching unit for switching audio and video signals. The remaining components other than the broadcast signal receiver 15 and the additional switching unit are the same as in Fig. 2.

Referring to Fig. 5, the second broadcast signal receiver 15 is a receiver for receiving only the emergency-warning broadcast signal, includes a tuner and an IF (Intermediate Frequency) processor, and performs a channel selection control operation using the controller 70. The second broadcast signal receiver 15 is fixed to a prescribed channel to receive only the emergency-warning broadcast signal, divides the received broadcast signal into an audio signal and a CVBS signal, and outputs the audio and CVBS

signals to the first audio switching unit 110, the emergency-warning broadcast signal divider/processor 60, and the second video switching unit 140.

The first audio switching unit 110 selects either an
5 audio signal received from an external device via an audio input terminal or the other audio signal generated from the second broadcast signal receiver according to a control signal of the controller 70, and outputs the selected audio signal. Upon receipt of a control signal from the controller
10 70, the second audio switching unit 120 selects either an output signal of the first switching unit 110 or an audio signal separated by the first broadcast signal receiver 10.

Upon receipt of a control signal from the controller 70, the TV system shown in Fig. 5 selects either audio
15 signals received from the first and second broadcast signal receivers 10 and 15 or an audio signal received from an external source device, processes the selected audio signal using the audio signal processor 40, and audibly outputs it using the audio signal generator 50.

20 Similar to the aforementioned audio signal flow, the TV system selects either video signals received from the first and second broadcast receivers 10 and 15 or a video signal received from the external source device according to a control signal of the controller 70, processes the
25 selected video signal using the video signal processor 20,

and finally outputs it via a CRT (Cathode Ray Tube).

A method for propagating the emergency-warning broadcast signal using the aforementioned TV system can be classified into two processes, i.e., a propagation process in a power-supply OFF mode, and the other propagation process in a power-supply ON mode.

The propagation process in the power-supply OFF mode can be recognized by allowing the second broadcast signal receiver 15 to determine whether the emergency-warning broadcast signal is received in a corresponding area, as previously stated in Fig. 3. If the broadcast signal receiver 15 detects TV emergency-warning broadcast start information, broadcast transmission time information is equal to system time information, and the current broadcast signal indicates an emergency-warning broadcast signal associated with a corresponding area, the controller 70 powers on the system power-supply unit, and controls individual switching units 110, 120, and 140 to output the received broadcast signal in the form of AV data. A caption signal for use in the emergency-warning broadcast signal received from the second broadcast signal receiver 15 is processed in the form of RGB caption data using the emergency-warning broadcast signal divider/processor 60, the RGB caption-processed result is mixed with a broadcast signal in the video signal processor 20, and then the mixed

result signal is finally created.

Although the controller 70 receives other channels other than the emergency-warning broadcast channel from the first broadcast signal receiver 10, if the emergency-warning broadcast signal is suddenly propagated, the controller 70 can transmit the emergency-warning broadcast signal using the second broadcast signal receiver 15 and the emergency-warning broadcast signal divider/processor 60, and can determine whether a real-time emergency-warning broadcast operation associated with the corresponding area is performed. Therefore, the emergency-warning broadcast signals propagated over the second broadcast signal receiver 15 can be propagated to TV viewers by means of individual switching units 110, 120, 130, and 140.

Although the TV viewer currently views and listen to a TV program of another channel, he or she can quickly receive the emergency-warning broadcast signal via a dedicated emergency-warning broadcast tuner.

Although the TV system of Fig. 5 includes a plurality of video and audio switching units, it should be noted that a single video switching unit and a single audio switching unit are contained in the TV system such that the final audio and video signals can also be selectively transmitted to a post-processor.

Although the above-identified description adapts the

analog-type color TV system as an example for the convenience of description and better understanding of the preferred embodiment of the present invention, it should be noted that the present invention is also applicable to a digital-type TV system.

Fig. 6 is a block diagram illustrating a TV system for the purpose of digital emergency-warning broadcast. Similar to the aforementioned TV system of Fig. 2, the TV system of Fig. 6 includes a single tuner, and components needed to propagate the emergency-warning broadcast signal in the power-supply standby mode.

Referring to Fig. 6, the broadcast data receiver 200 includes a tuner and an IF processor. The tuner contained in the broadcast data receiver 200 receives digital TV broadcast data received over an antenna, performs a channel selection operation according to a control signal of the controller 280, and outputs IF data in response to the channel selection operation. The IF processor converts IF data created from the tuner into baseband data, and outputs the baseband data.

The channel processor (or channel decoder) 210 performs channel decoding on the baseband data created from the IF processor, resulting in reproduction of data bit stream. In more detail, the channel processor 210 reproduces

a data bit stream associated with video data entered by the external device such as a VCR.

The TV decoder 220 separates audio data, video data, and additional data from the data bit stream reproduced by the channel processor 210, and outputs the separated data, respectively. The audio data is applied to the MPEG-2 audio decoder 260, and is decoded in the MPEG-2 decoder 260 according to a prescribed MPEC standard. The amplifier 270 amplifies the level of the decoded audio data, and outputs the amplified audio signal.

The video data is applied to the MPEG-2 video decoder 230, is decoded in the MPEG standard, is applied to the OSG (On Screen Graphic) mixer 240, and is added to OSG data created by a control signal of the controller 280. The added result video data is processed in the form of video data, and the processed result is displayed on the video output unit 250 serving a picture tube. The OSG data is displayed on a screen in the form of graphic or text data by means of the controller 280.

The auxiliary data separated by the TX decoder 220 is applied to the controller 280. The auxiliary data indicates emergency-warning broadcast control information codes for implementing the present invention, is composed of plural control information as shown in Fig. 1, and is processed in the form of information data or digital-closed caption data

by means of the broadcasting station, such that the resultant processing data is finally transmitted in the form of such information data (also called ancillary data) or digital-closed caption data.

5 The controller 280 controls overall operations of the digital TV system. For example, in the case of detecting emergency-warning broadcast start information, predetermined area information, and emergency-warning broadcast transmission time information from among the decoded
10 emergency-warning broadcast control information, the controller 280 powers the TV system on, converts a system operation mode into a TV viewing mode, and controls the TV system to output broadcast data of the prescribed emergency-warning broadcast channel in the form of AV data. The memory
15 290 stores control program data for controlling TV system's operations, and temporarily stores data created during the system control operation.

If the TS decoder 220 detects an emergency-warning broadcast start code at step 1, the controller 280 of the TV
20 system having a standby power-supply unit receives control code information subsequent to the detected emergency-warning broadcast start code at step 2, and stores the received control code information.

The controller 280 determines whether a difference
25 between emergency-warning broadcast transmission time

information and TV system's RTC information is in the range of a predetermined allowable error at step 3. If it is determined that the difference between the emergency-warning broadcast transmission time information and the TV system's
5 RTC information is in the range of the predetermined allowable error at step 3, the controller 280 determines whether the received emergency-warning broadcast reception area information contains specific information equal to area information registered in the memory at step 4. If the
10 received emergency-warning broadcast reception area information contains the same specific information as area information registered in the memory at step 4, the controller 280 powers on a system's main power-supply unit at step 5 to provide system's individual components in a
15 power-supply standby mode with an operation power-supply voltage. The controller 280 outputs a volume control signal to increase a volume level of the TV system, this volume control signal is transmitted to the amplifier 270, and thereby the amplifier 270 increases the output volume level
20 of the TV system.

The emergency-warning broadcast caption data, that has been separated by the TS decoder 220 and has been transmitted to the controller 280, is outputted in the form of OSG data, and may be applied to the OSG mixer 240.

25

Fig. 7 is a block diagram illustrating a TV system having a dedicated receiver 300 for receiving the emergency-warning broadcast signal. Because the TV system shown in Fig. 7 includes the dedicated receiver 300, it can continuously determine whether the emergency-warning broadcast signal is received. The TV system's operation can be classified into two processes, i.e., a propagation process in a power-supply OFF mode, and the other propagation process in a power-supply ON mode.

The propagation process in the power-supply OFF mode can be recognized by allowing the dedicated broadcast signal receiver 310 to determine whether the emergency-warning broadcast signal is received in a corresponding area, as previously stated in Fig. 6. If the broadcast signal receiver 310 detects TV emergency-warning broadcast start information, broadcast transmission time information is equal to system time information, and the current broadcast signal indicates an emergency-warning broadcast signal associated with a corresponding area, the controller 280 powers the system power-supply unit on, and controls the MPEG audio decoder 260 and the video decoder 230 to output the broadcast data received from the broadcast signal receiver 310 in the form of AV data. Caption data for use in the emergency-warning broadcast signal received from the broadcast signal receiver 310 is mixed with broadcast data

in the OSG mixer 240, such that the mixed result signal is finally created.

Although the controller 280 receives other channels other than the emergency-warning broadcast channel from a first broadcast signal receiver 200, if the emergency-warning broadcast signal is suddenly propagated, the controller 280 can transmit the emergency-warning broadcast signal using the second broadcast signal receiver 310 and the TS decoder 330, and can determine whether a real-time emergency-warning broadcast operation associated with the corresponding area is performed using the same components 310 and 330. Therefore, the emergency-warning broadcast signals propagated over the second broadcast signal receiver 310 can be propagated to TV viewers using the MPEG audio decoder 260 and the video decoder 230.

Although the TV viewer currently views and listen to a TV program of another channel, he or she can quickly receive the emergency-warning broadcast signal via a dedicated emergency-warning broadcast tuner.

The digital broadcast signal is composed of data streams, adds a predetermined code to data in predetermined units (i.e., packet), divides each data stream into a plurality of data sections using the predetermined code, and transmits the divided data sections. In case of a specific channel "r", digital broadcast data is composed of video data,

audio data, and auxiliary data (i.e., emergency-warning broadcast data). In case of the other channel "s", digital broadcast data is also composed of video data, audio data, and auxiliary data (i.e., emergency-warning broadcast data). If
5 the channel "s" starts broadcasting an emergency-warning broadcast program on the condition that a TV viewer currently views a TV program of the channel "r", the broadcasting station changes the channel code "r" to the other channel code "s" in such a way that it can compulsorily control the TV
10 viewer of the channel "r" to view the emergency-warning broadcast program of the channel "s". In other words, the broadcasting station can freely change a current channel code to another channel code if needed.

In the case of using a customer database (DB) widely
15 used for a data broadcast system or a satellite broadcast system, on the assumption that a unique customer number is assigned to individual customers registered in the customer DB, a data entry unit for entering various data such as the unique customer number is contained in a controller and a
20 memory, a data entry unit for entering various data such as the unique customer number is also contained in a smart card reader installer or a smart card of a TV system, and the TV system corresponds to a subset stored in the customer DB through the medium of the unique customer number, if the
25 subset stored in the customer DB is selected, a TV system

corresponding to the unique customer number associated with the selected subset is selected, and an emergency-warning broadcast start signal or emergency-warning broadcast start data received in the built-in decoder and controller contained in the TV system can be detected.

The customer DB may classify a plurality of customer into a plurality of broadcast signal reception groups. For example, the customer DB stores subsets classified according to a variety of conditions (e.g., area, group, and genre), and stores data in the form of intersection or union of the classified subsets in such a way that the TV system can be associated with individual unique customer numbers of the subsets.

Industrial Applicability

As apparent from the above description, a TV system according to the present invention for enabling a TV viewer to view and listen to an emergency-warning broadcast program even though it has been powered off, resulting in a maximum of emergency-warning broadcast effect.

The TV system can quickly broadcast an emergency-warning broadcast program indicative of a disaster situation to a TV viewer who views video data reproduced by a video player (e.g., a VCR or a DVDP).

Although the present invention has been described in connection with specific preferred embodiments, those skilled in the art will appreciate that various modifications, additions, and substitutions to the specific elements are possible, without departing from the scope and spirit of the present invention as disclosed in the accompanying claims.

Claims:

1. A method for propagating an emergency-warning broadcast signal in a television (TV) system, comprising the steps of:

- 5 a) receiving a broadcast signal or broadcast data;
- b) detecting an emergency-warning broadcast signal or emergency-warning broadcast data being overlapped with or inserted in the received broadcast signal or the received broadcast data; and
- 10 c) if predetermined registration information is detected from among the detected emergency-warning broadcast signal or the detected emergency-warning broadcast data, powering on a main power-supply unit of the TV system.

2. The method as set forth in claim 1, further comprising the step of:

15

- d) if emergency-warning broadcast termination information is detected from among the detected emergency-warning broadcast signal or the detected emergency-warning broadcast data, powering off the main power-supply unit of
- 20 the TV system.

3. The method as set forth in one of claims 1 and 2, further comprising the step of:

e) increasing an output volume level of the TV system until reaching a predetermined volume level.

4. The method as set forth in one of claims 1 and 2, further comprising the step of:

5 f) if emergency-warning broadcast start information is detected from among the detected emergency-warning broadcast signal or the detected emergency-warning broadcast data, selecting a prescribed channel.

10 5. The method as set forth in one of claims 1 and 2, further comprising the step of:

g) if emergency-warning broadcast start information is detected from among the detected emergency-warning broadcast signal or the detected emergency-warning broadcast data, and registered reception area information, reception group
15 information, or genre information is detected, powering on the main power-supply unit of the TV system.

6. The method as set forth in one of claims 1 and 2, further comprising the step of:

h) if emergency-warning broadcast caption start
20 information is detected from among the broadcast signal or the broadcast data, displaying subsequent emergency-warning broadcast caption information.

7. The method as set forth in one of claims 1 and 2, further comprising the step of:

i) if emergency-warning broadcast start information is detected, activating an emergency-warning unit to propagate the emergency-warning broadcast signal.

8. A method for propagating an emergency-warning broadcast signal using a customer database (DB) for use in a data or satellite broadcast scheme, comprising the steps of:

a) separating customer's area information, customer's group information, or customer-desired genre information from a broadcasting station's database, decoding an emergency-warning broadcast signal or emergency-warning broadcast data being overlapped with or inserted in a broadcast signal or broadcast data, and determining whether emergency-warning broadcast start information is detected;

b) if the emergency-warning broadcast start information is detected, receiving subsequent emergency-warning broadcast control information;

c) providing individual components of a television (TV) system with an operation power-supply voltage (i.e., a main power-supply voltage), and powering on a main power-supply unit of the TV system.

9. A method for propagating an emergency-warning broadcast signal for use in a television (TV) system having at least one tuner in a power-supply standby mode, comprising the steps of:

5 a) decoding an emergency-warning broadcast signal or emergency-warning broadcast data being overlapped with or inserted in a broadcast signal or broadcast data pre-selected or received in a dedicated tuner, and determining whether emergency-warning broadcast start information is
10 detected;

 b) if the emergency-warning broadcast start information is detected, receiving subsequent emergency-warning broadcast control information;

 c) if a difference between emergency-warning broadcast
15 transmission time information and TV system's RTC (Real Time Clock) information contained in the emergency-warning broadcast control information is lower than a predetermined allowable error, determining whether specific information equal to pre-stored area information, pre-stored group
20 information or pre-stored genre information is found in the emergency-warning broadcast control information; and

 d) if the specific information equal to the pre-stored area, group, or genre information is found, providing individual components of the TV system with an operation
25 power-supply voltage, and power on a main power-supply unit

of the TV system.

10. The method as set forth in claim 9, further comprising the steps of:

5 e) if a test code is detected from among emergency-warning broadcast control information, storing the detected test code; and

f) if a test command is received, powering on the TV system using the stored test code, or increasing a volume level of the TV system using the stored test code.

10 11. The method as set forth in one of claims 9 and 10, further comprising the steps of:

g) if an external entry mode is selected, selecting a broadcast channel for transmitting an emergency-warning broadcast signal;

15 h) detecting an emergency-warning broadcast signal or emergency-warning broadcast data being overlapped with or inserted in the broadcast signal or data received via the selected broadcast channel;

20 i) if predetermined registration information is detected from among the detected emergency-warning broadcast signal or the detected emergency-warning broadcast data, displaying AV (Audio and Video) signals received via the selected broadcast channel.

12. A method for propagating an emergency-warning broadcast signal in a television (TV) system having at least two tuners, comprising the steps of:

5 a) detecting an emergency-warning broadcast signal or emergency-warning broadcast data being overlapped with or inserted in a broadcast signal or data of an emergency-warning broadcast channel received via a first tuner contained in the two tuners; and

10 b) if predetermined registration information is detected from among the detected emergency-warning broadcast signal or the detected emergency-warning broadcast data, displaying a broadcast signal or data received via the emergency-warning broadcast channel.

13. The method as set forth in claim 12, further comprising the step of:

15 c) if emergency-warning broadcast termination information is detected from among the detected emergency-warning broadcast signal or the detected emergency-warning broadcast data, displaying a broadcast signal or data of a channel selected by a second tuner contained in the two
20 tuners.

14. A television (TV) apparatus for propagating an

emergency-warning broadcast signal, comprising:

an emergency-warning broadcast signal divider/processor for separating an emergency-warning broadcast signal or emergency-warning broadcast data being overlapped with or inserted in reception broadcast signal or data from overall reception information, decoding the separated signal or data with emergency-warning broadcast control information, and outputting the decoded result; and

a controller for either powering on a main power-supply unit of the TV apparatus or switching a system operation mode to a TV viewing mode when predetermined registration information is detected from among the decoded emergency-warning broadcast control information, and displaying a broadcast signal or data of a predetermined emergency-warning broadcast channel in the form of AV (Audio and Video) data.

15. The apparatus as set forth in claim 14, wherein the controller selects a channel of a broadcast signal receiver in order to receive the broadcast signal or data of the prescribed emergency-warning broadcast channel in a power-supply standby mode and a video play mode.

16. A television (TV) apparatus for propagating an emergency-warning broadcast signal including a tuner for

receiving a broadcast signal or broadcast data, and a receiver for receiving a first broadcast signal or first broadcast data, comprising:

5 a second broadcast signal receiver for receiving only a broadcast signal or data of an emergency-warning broadcast channel;

10 an emergency-warning broadcast control information processor for separating an emergency-warning broadcast signal or emergency-warning broadcast data being overlapped with or inserted in the broadcast signal or data received via the second broadcast signal receiver from overall reception information, decoding the separated signal or data with emergency-warning broadcast control information, and outputting the decoded result; and

15 a controller for powering on a main power-supply unit of the TV apparatus when predetermined information registered in a memory is detected from among the decoded emergency-warning broadcast control information.

20 17. A digital television (TV) apparatus including a channel divider for performing channel decoding on baseband data created from an IF (Intermediate Frequency) processor to reproduce a data bit stream, comprising:

a TS decoder for separating audio data, video data, and additional data from the data bit stream reproduced by

the channel divider; and

a controller for either powering on a power-supply unit of the TV apparatus or switching a system operation mode to a TV viewing mode when predetermined registration
5 information is detected from among the emergency-warning broadcast control information decoded by the TS decoder, and displaying a broadcast signal or data of a predetermined emergency-warning broadcast channel in the form of AV (Audio and Video) data.

10 18. The apparatus as set forth in claim 17, wherein the controller controls a predetermined tuner to select a broadcast signal or data of the predetermined emergency-warning broadcast channel upon receiving a power-supply OFF mode or a video play command.

15 19. The apparatus as set forth in one of claims 17 and 18, further comprising:

a dedicated tuner for receiving only broadcast data of the emergency-warning broadcast channel; and

20 an IF processor, a channel processor, and a TS decoder that serve as post-processors of the dedicated tuner.

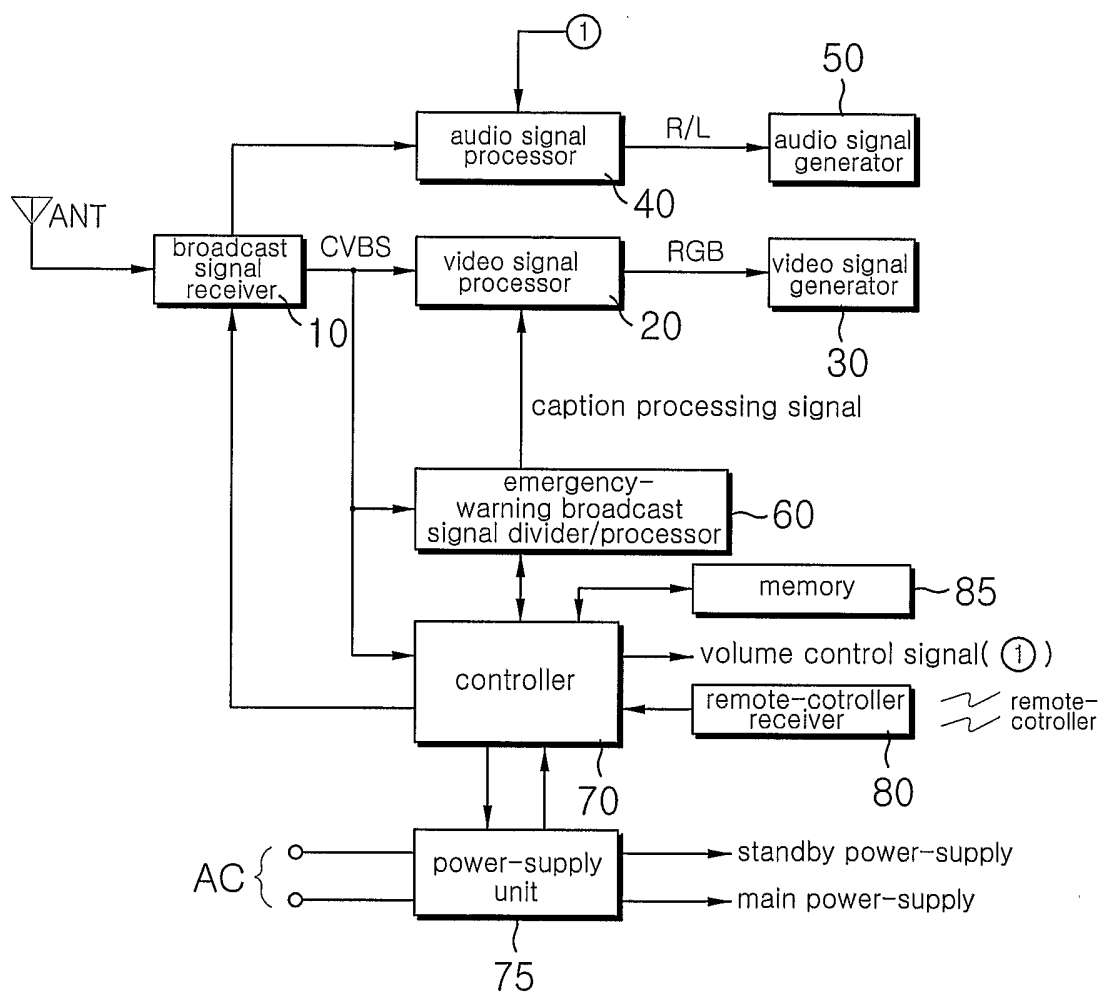
Fig. 1

control code	TV automatic emergency-warning broadcast start		test code		TV automatic emergency-warning broadcast transmission time		TV automatic emergency-warning broadcast duration		The number of TV automatic emergency-warning broadcast reception areas		TV automatic emergency-warning broadcast reception area 1	
Hex	ID37	ID37			year/month/day/hour/minute	year/month/day/hour/minute	xx	xx	xx	xx	xx/xx/xx/xx	xx/xx/xx/xx
The number of bytes	2	2	1	1	5	5	1	1	1	1	4	4

	TV automatic emergency-warning broadcast reception area 2			TV automatic emergency-warning broadcast reception area Nt		TV automatic emergency-warning broadcast reception group		TV automatic emergency-warning broadcast caption start		TV automatic emergency-warning broadcast caption data	TV automatic emergency-warning broadcast caption termination		TV automatic emergency-warning broadcast termination	
	xx/xx/xx/xx	xx/xx/xx/xx		xx/xx/xx/xx	xx/xx/xx/xx	xx	xx	ID39	ID39	text	ID3A	ID3A	ID38	ID38
	4	4		4	4	1	1	2	2		2	2	2	2

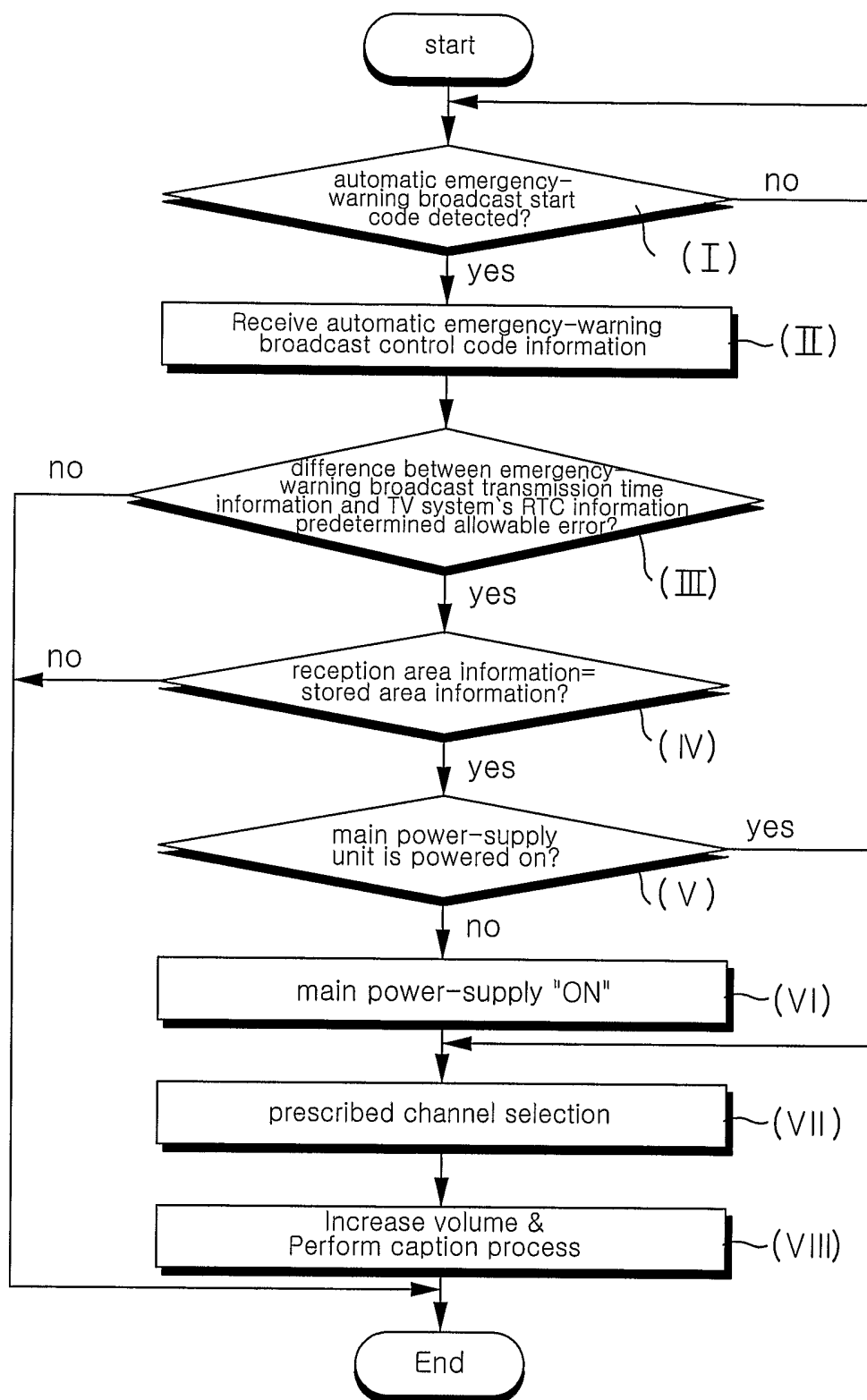
2/7

Fig.2



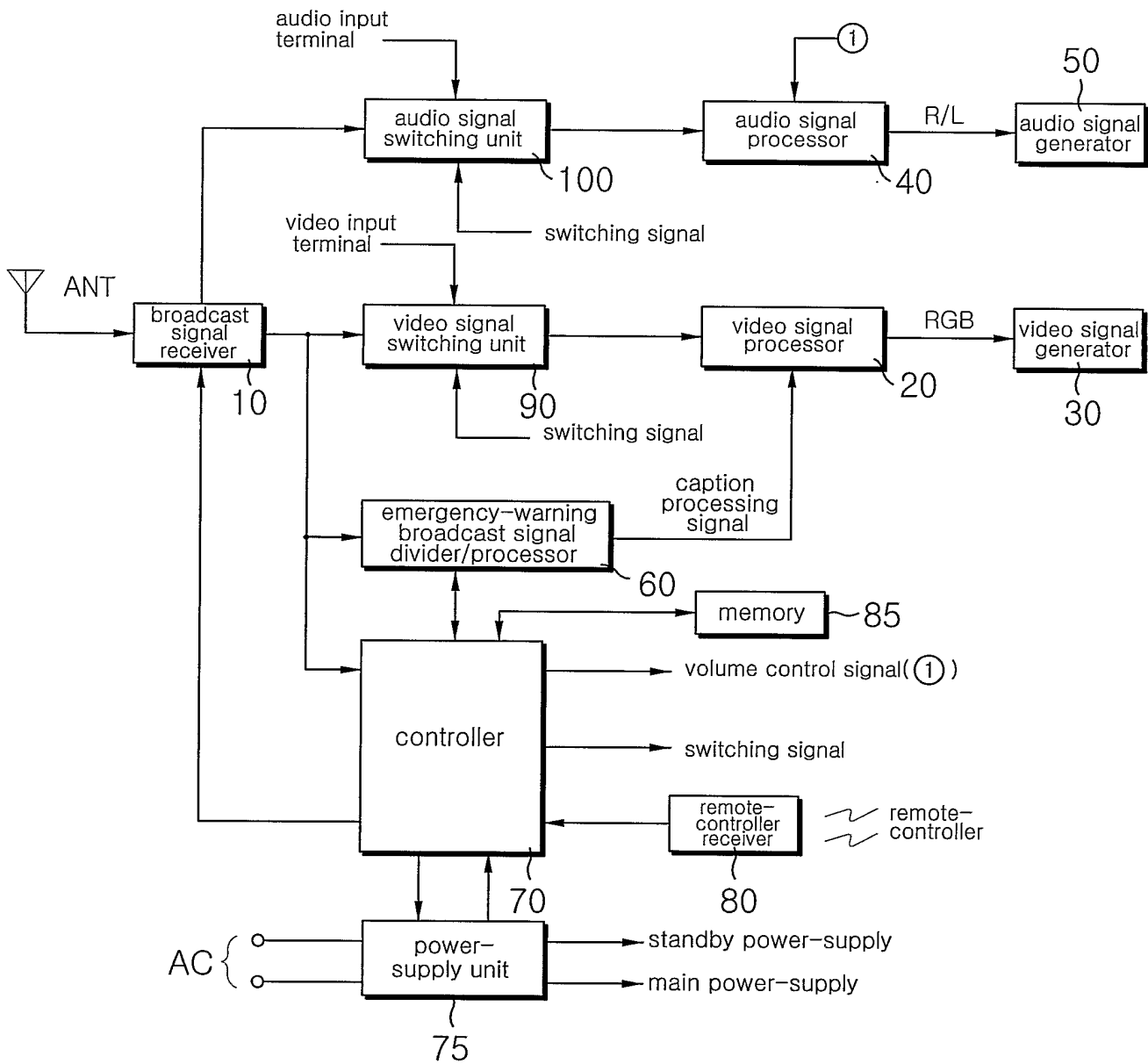
3/7

Fig.3



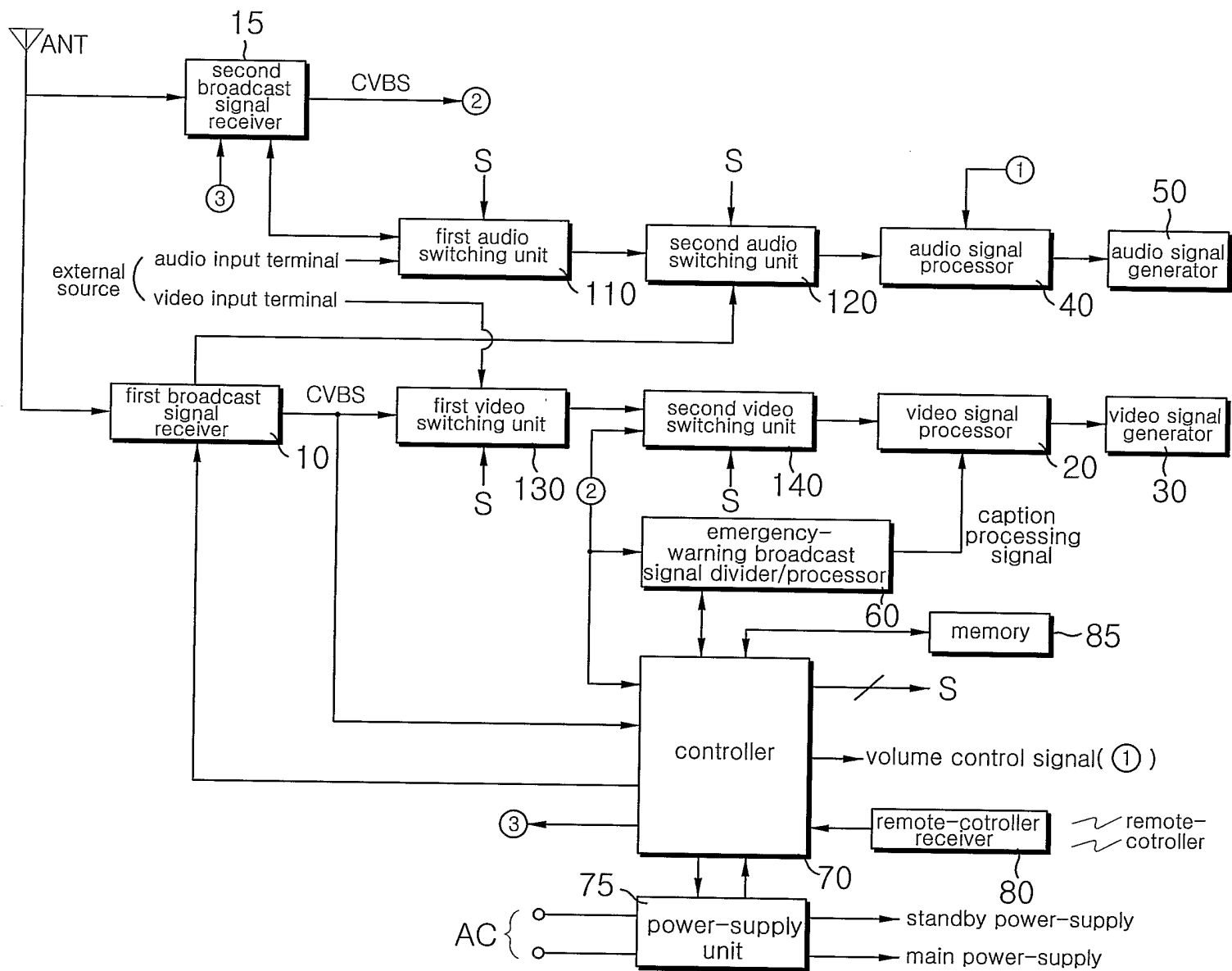
4/7

Fig. 4



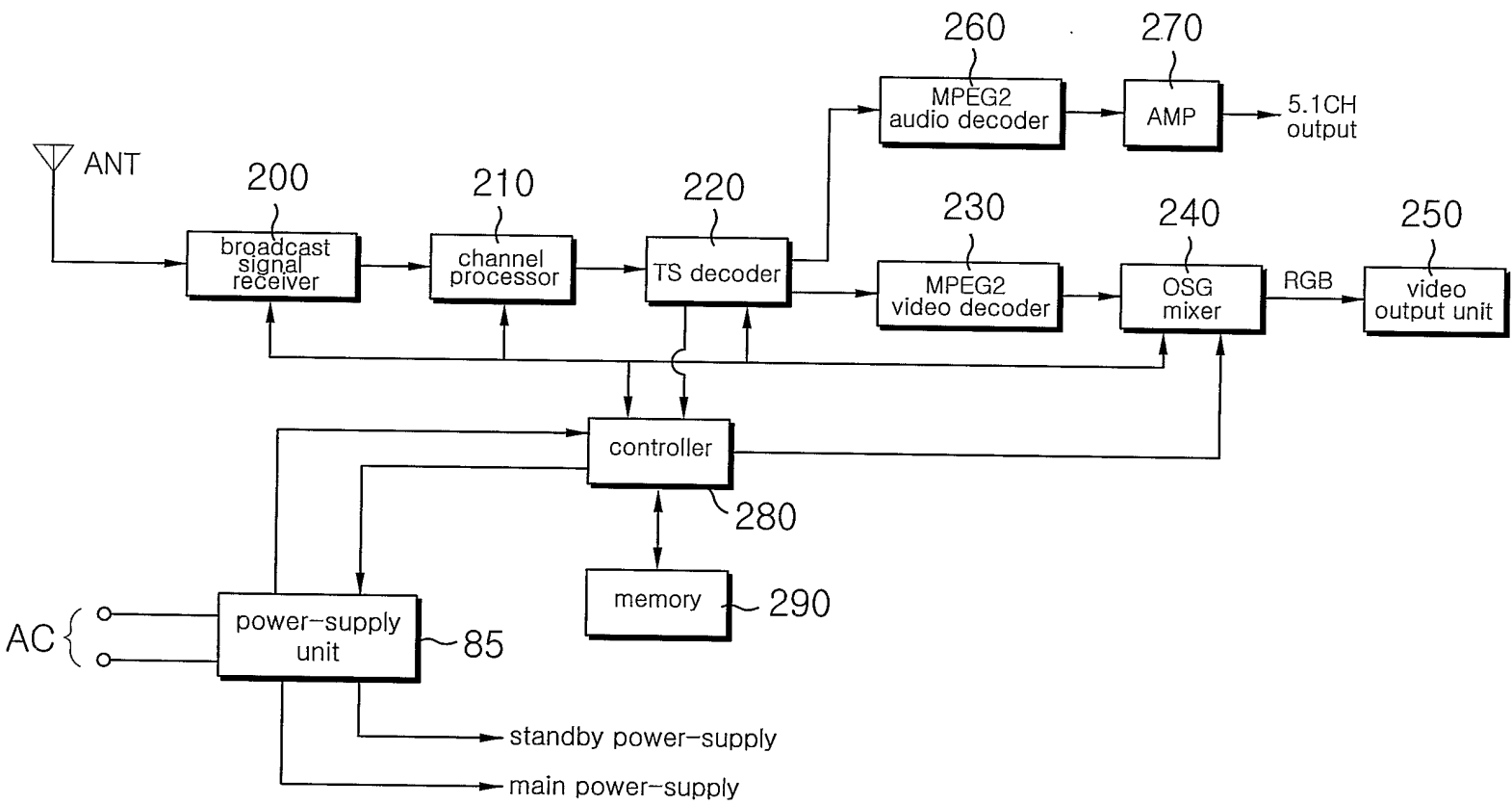
5/7

Fig.5



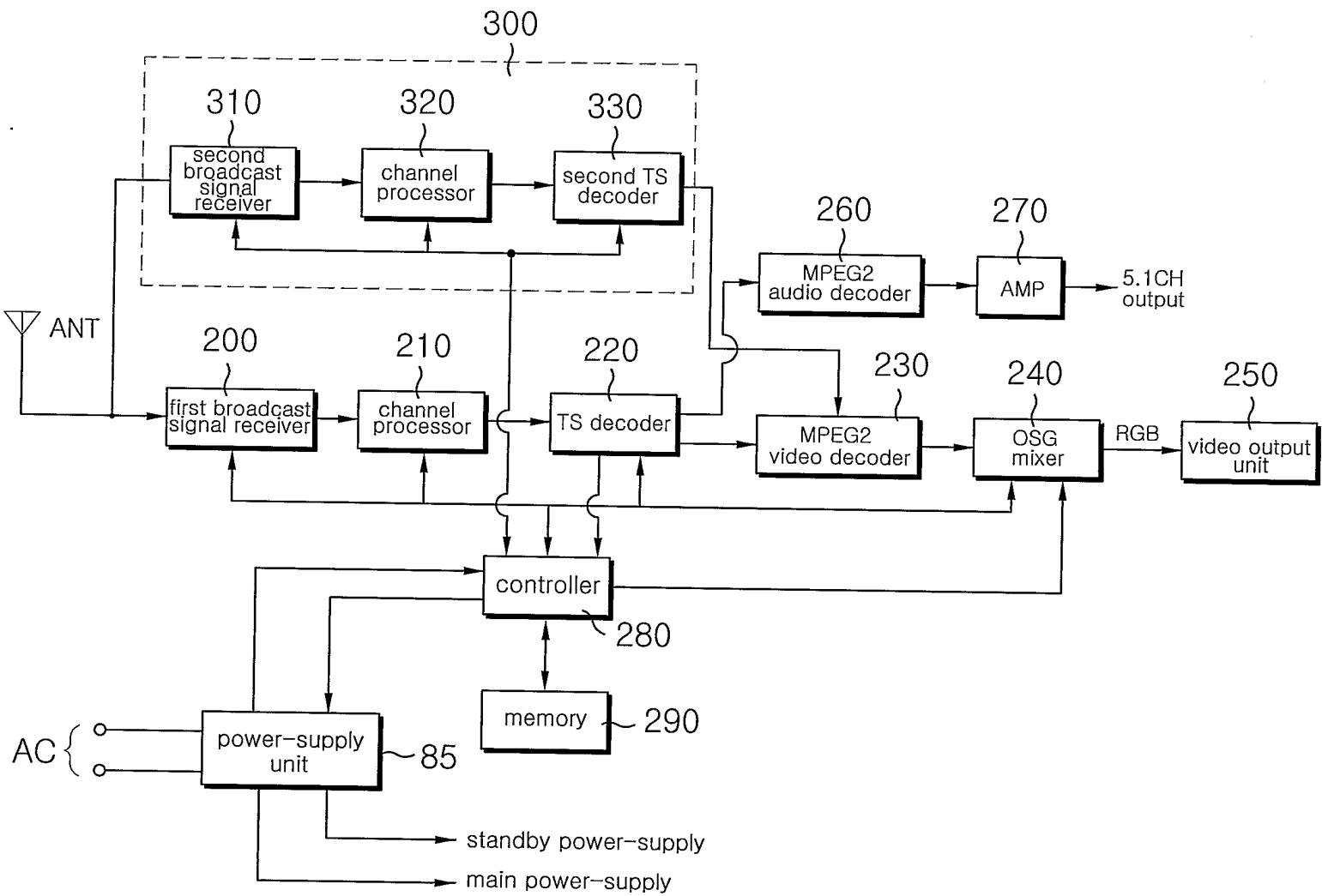
6/7

Fig. 6



7/7

Fig. 7



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2003/002080

A. CLASSIFICATION OF SUBJECT MATTER**IPC7 G08B 27/00**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7 G08B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
KR, JP : IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PAJ, FPD, USPAT

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 58-134588 A (HITACHI) 10 AUGUST 1983	1 - 3, 7, 14, 17
Y	See the whole document and Fig.1 - 2	4, 6, 10, 11, 13, 19
Y	KR 1984-0003050 A (RINNAL) 13 AUGUST 1984 See the whole document and Fig.1	4, 6, 11
X	KR 1986-002068 A (GOLDSTAR) 26 MARCH 1986	5, 8, 12, 16
Y	See claim 1 and Fig.1	9, 10, 13, 19
Y	KR 1988-0010387 U (KIM, JAE SUN) 27 JULY 1988 See the whole document and Fig.1	9, 10

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

08 JANUARY 2004 (08.01.2004)

Date of mailing of the international search report

08 JANUARY 2004 (08.01.2004)

Name and mailing address of the ISA/KR



Korean Intellectual Property Office
920 Dunsan-dong, Seo-gu, Daejeon 302-701,
Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

JEONG, Jae Heon

Telephone No. 82-42-481-5672



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2003/002080

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 04-022940 A (ABE TADASHI) 27 JANUARY 1992 See the whole document	1, 14, 17

Form PCT/ISA/210 (continuation of second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2003/002080

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 58-134588 A	10/08/1983	None	
KR 1984-0003050 A	13/08/1984	JP 58-119091 A	15/07/1983
KR 1986-002068 A	26/03/1986	None	
KR 1988-0010387 U	27/07/1988	None	
JP 04-022940 A	27/01/1992	None	