

Inquiry of history information

Scope of Claims (PatentsApplication2004-108399)

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.

[Document Name]Patent Claims

[Claim 1]

A symbol determination means for obtaining a baseband signal representing a sequence of multi-valued symbols and determining the symbol represented by the baseband signal; and a communication quality determination means for determining a communication quality of a transmission path through which the baseband signal is transmitted based on a content of the symbol determined by the symbol determination means, wherein at least a part of a bit sequence constituting data to be transmitted represented by the sequence of symbols is distinguished as a protection target portion, the communication quality determination apparatus, wherein at least a part of the symbols belonging to the sequence of symbols includes bits belonging to the protection target portion and redundant bits having a predetermined value, and the communication quality determination unit specifies the number of redundant bits having the predetermined value or redundant bits not having the predetermined value among redundant bits included in the symbols including the bits belonging to the protection target portion, and determines the communication quality of the transmission path based on a result of the specification.

[Claim 2]

The communication quality determination device according to claim 1, further comprising a data change unit configured to, when the communication quality determined by the communication quality determination unit does not satisfy a predetermined condition, make a predetermined change to data to

be transmitted represented by a symbol used for the determination.

[Claim 3]

The communication quality determination apparatus according to claim 2, wherein the data change unit includes a unit configured to externally acquire a parameter that defines at least a part of the condition.

[Claim 4]

The communication quality determination device according to claim 2 or 3, wherein the predetermined change includes a process of substantially discarding data to be transmitted represented by a symbol used for determining that the communication quality does not satisfy the predetermined condition.

[Claim 5]

The communication quality determination device according to claim 2, 3, or 4, wherein the predetermined change includes a process of replacing the data to be transmitted represented by the symbol used for determining that the communication quality does not satisfy the predetermined condition with past data represented by a symbol acquired in the past by the symbol determination means.

[Claim 6]

The communication quality determination device according to claim 5, wherein the predetermined change further includes a process of substantially discarding the data to be transmitted represented by the symbol that follows the last replaced data and is used for determining that the communication quality does not satisfy the predetermined condition when the replaced data continues for a predetermined number of times or more.

[Claim 7]

The communication quality determination device according to claim 2, 3, or 4, wherein the data to be transmitted includes data representing an intensity of a variable, and the predetermined change includes an attenuation process of changing the data to be transmitted represented by the symbol used for the determination that the communication quality does not satisfy the predetermined condition to data corresponding to data obtained by attenuating the variable represented by the data.

[Claim 8]

The communication quality determination device according to claim 7, wherein, when first data

transmitted immediately before second data to be subjected to the attenuation processing has been subjected to the attenuation processing, the attenuation processing performed on the second data includes processing of changing the second data to data corresponding to a variable represented by the second data attenuated at an attenuation ratio larger than an attenuation ratio of a variable represented by the first data.

[Claim 9]

A symbol determination step of obtaining a baseband signal representing a sequence of multi-valued symbols and determining the symbol represented by the baseband signal; and a communication quality determination step of determining a communication quality of a transmission path through which the baseband signal is transmitted based on a content of the symbol determined in the symbol determination step, wherein at least a part of a bit sequence constituting data to be transmitted represented by the sequence of symbols is distinguished as a protection target portion, the communication quality determination method, wherein at least some symbols belonging to the sequence of symbols include bits belonging to the protection target portion and redundant bits having a predetermined value, and in the communication quality determination step, the number of redundant bits having the predetermined value or redundant bits not having the predetermined value among redundant bits included in a symbol including bits belonging to the protection target portion is specified, and communication quality of the transmission path is determined based on a result of the specification.

[Claim 10]

A program for causing a computer to function as: symbol determination means for obtaining a baseband signal representing a sequence of multilevel symbols and determining the symbol represented by the baseband signal; and communication quality determination means for determining communication quality of a transmission path through which the baseband signal is transmitted based on the content of the symbol determined by the symbol determination means, wherein at least a part of a bit sequence constituting data to be transmitted represented by the sequence of symbols is, at least a part of the symbols belonging to the sequence of symbols, which are distinguished as the protection target portion, includes a bit belonging to the protection target portion and a redundant bit having a predetermined value, and the communication quality determination means specifies the number of redundant bits having the predetermined value or the number of redundant bits not having the predetermined value among redundant bits included in the symbol including the bit belonging to the protection target portion, and determines the communication quality of the transmission path based on a result of the specification, a program comprising:

 Inquiry of history information**Notice of Reasons for Refusal (PatentsApplication2004-108399)***** NOTICES ***

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.

Notice of Reasons for Refusal

Patent Application Number: Japanese Patent Application No. 2004 to 108399

Proposed: September 4, 2008

Examiner of Japan Patent Office: TANIOKA, Yoshihiko 3463 5K00

Patent Applicant Representative: Mitsuru Kimura

Applicable provisions: Article 29, Paragraph 2

This application should be refused for the reason mentioned below. If the applicant has any opinion(s) against the reason, a written opinion should be submitted within 60 days from the date on which this notification was dispatched. Reason

The claimed invention(s) in the each claim listed below of this patent application shall not be granted a patent under the provision of Patent Act Article 29 (2) for the reason that the claimed invention(s) could have easily been made by persons who have common knowledge in the technical field to which the claimed invention(s) pertains, on the basis of the invention(s) described in the distributed publication(s) listed below or made available to the public through electric telecommunication lines in Japan or other foreign countries prior to the filing of the patent application.

Note (For the cited documents, please refer to the list of cited documents below.)

Claims 1 to 4,9,10

Cited Document 1-3

In particular, abstract and paragraph [0006] of Cited Document 1, [0007], [0023]-[0026] Paragraph describes that (in order to improve the reception characteristics when the call signal traffic is small) a redundant bit ("0") having a predetermined value is added to the information bit (protected portion), and communication using symbols at a distance is performed. In the field of communication technology, it is a well-known matter to want to grasp the communication quality and reception quality of a transmission line, and on the other hand, a technique for measuring the above-mentioned quality by using known information having a predetermined value in a frame is also a well-known technique (see, for example, Cited Document 2 (furthermore, Table 1 and its explanation also describe that a transmission unit including known information is substantially discarded according to the obtained quality) and Cited Document 3 (in particular, Claim 1)), and therefore, it is deemed that a person skilled in the art could have easily conceived of obtaining the communication quality of the transmission line by using redundant bits which are known information in the invention described in Cited Document 1.

<Claim(s) in which no reason for refusal is found>

The invention as in claim 5-8, no reason for refusal has been found at present. If any reason for refusal is found later, it will be notified.

The list of cited documents etc.

1.JP H 11-220762A

2.JP H 05-260021A

3.JP H 05-284147A

Record of the result of prior art search

-Fields examined: IPC H04L 1 / 00,20

-Prior art document: Japanese Patent Application Laid-Open No. 174485 / 2003

JP 2003-338851A

Japanese Unexamined Patent Application Publication No. 2003 / 099096

The record of this prior art document search result does not constitute a reason for refusal, but it does not prevent the amendment from being cited as an example of well-known art, etc.

If the applicant has any inquiries concerning this notification of refusal or wishes to have an interview, please contact the following.

Patent Examination Department 4 Digital Communication Tanioka

TEL. 03 (3581) 1101 Ext. 3556

FAX. 03(3501)0699

Director / Deputy, Examination Director / Deputy, Examiner, Assistant Examiner, Takayuki Yoshida,
Yoshihiko Tanioka, 9077 3463

 Inquiry of history information**Written Opinion (PatentsApplication2004-108399)***** NOTICES ***

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.

[Document Name]Written Opinion

[Reference Number]P07-975603

[Date of submission]November 10, 2008

[Recipient] Examiner of the Japan Patent Office: Yoshihiko Tanioka

[Indication of case]

[Application number]Japanese Patent Application No. 2004 / 108399

[Patent applicant]

[Identification Number]000003595

[Name]Kenwood Corporation

[Representative]

[Identification Number]100095407

[Patent attorney]

[Name]Mitsuru Kimura

[Shipping number]541347

[Content of Opinion]

1. In the notification of reasons for refusal dated September 9, 2008 (dispatch date), the examiner cited the following Cited Documents 1-3 regarding Claims 1-4, 9, and 10, and recognized that the invention cannot be granted a patent under the provisions of the Patent Act Article 29 (2).

Cited document 1, Japanese Patent Application Laid-Open No. 220762 / 1999

Cited document 2, Japanese Patent Application Laid-Open No. 260021 / 05

In view of the matters pointed out in Cited Document 3 and Japanese Patent Application Laid-Open No. 284147 / 05, a written amendment is submitted on the same date as this written opinion to amend the statements of the scope of claims, etc., and the following opinions are stated.

2. Amendment and its Basis

The content of this amendment and its grounds are shown below.

(1) Claim 1

The invention according to Claim 1 is an invention in which the constituent elements of Claim 2 and Claim 5 are incorporated into the original Claim 1 of the present application. Therefore, the amendment does not add any new matter. In addition, no reason for refusal has been found for the invention according to the original Claim 5 of the present application. Therefore, it is considered that the invention according to the amended Claim 1 has a inventive step.

(2) Claim 2

Claim 2 is obtained by moving up the original Claim 6 of the present application. Therefore, the amendment does not add any new matter. In addition, no reason for refusal has been found for the invention according to the original Claim 6 of the present application. Therefore, it is considered that the invention according to the amended Claim 2 has a inventive step.

(3) Claim 3

The invention according to Claim 3 is an invention in which the constituent elements of Claim 2 and Claim 7 are incorporated into the original Claim 1 of the present application. Therefore, the amendment does not add any new matter. In addition, no reason for refusal has been found for the invention according to the original Claim 7 of the present application. Therefore, it is considered that the invention according to the amended Claim 3 has a inventive step.

(4) Claim 4

Claim 4 is obtained by moving up the original Claim 8 of the present application. Therefore, the amendment does not add any new matter. In addition, no reason for refusal has been found for the invention according to the original Claim 8 of the present application. Therefore, it is considered that the invention according to the amended Claim 4 has a inventive step.

(5) Claim 5

The invention described in Claim 5 is an invention of a method corresponding to Claim 1. Therefore, as in Claim 1, the amendment does not add any new matter. It is considered that the invention according to Claim 5 also has a inventive step as in Claim 1.

(6) Claim 6

The invention described in Claim 6 is an invention of a method corresponding to Claim 3. Therefore, as in Claim 3, the amendment does not add any new matter. We consider that the invention according to Claim 6 also has a inventive step as in Claim 3.

(7) Claim 7

The invention according to Claim 7 corresponds to the original Claim 1 of the present application, and is amended within the scope described in the detailed description of the invention in the original description of the present application. Each component is described below.

(7-1) It has been clarified that the symbol determination means "acquires a signal, which is a sequence of symbols configured by adding one redundant bit of a predetermined value to each bit to be protected

based on a bit sequence composed of a plurality of bits to be protected and a plurality of other bits, expanding each bit to two bits so as to take the maximum value or the minimum value of four symbol values, and grouping each of the other bits into two bits so as to take four symbol values, and determines each symbol included in the signal". The amendment is based on, for example, paragraphs [0048] and [0054] - [0059] and FIG. 7.

(7-2) It is clarified that the communication quality determination means "determines the communication quality of the transmission path through which the signal is transmitted based on the number of redundant bits that are the predetermined value or are not the predetermined value among the redundant bits included in each symbol determined by the symbol determination means". The amendment is based on, for example, paragraphs [0060] - [0066] and FIG. 8. Therefore, the amendment does not add any new matter.

(8) Claim 8

Claim 8 is obtained by moving down the original Claim 2 of the present application. Therefore, the amendment does not add any new matter.

(9) Claim 9

The invention according to Claim 9 corresponds to the original Claim 4 of the present application. The invention according to Claim 9 has been amended within the scope described in the detailed description of the invention in the original description of the present application, and it has been clarified that "the predetermined change includes a process of substantially discarding the data to be transmitted represented by the symbol used for determining that the communication quality does not satisfy the predetermined condition when the number of redundant bits that are not the predetermined value is equal to or greater than the predetermined number". The amendment is based on, for example, paragraphs [0064] and [0065] and Fig. 8. Therefore, the amendment does not add any new matter.

(10) Claim 10

The invention described in Claim 10 is an invention of a method corresponding to Claim 7. Therefore, as in Claim 7, the amendment does not add any new matter.

(11) Others

In addition, amendments to clarify the contents of the present invention have also been made.

As described above, the inventions according to Claims 1-6 have a inventive step. Therefore, the inventions according to Claims 7-10 will be described below.

3. Features of the Invention

(1) Claim 7

A communication quality determination device according to the invention described in claim 7 has a characteristic configuration comprising: I) a symbol determination means for acquiring a signal which is a sequence of symbols formed by adding one redundant bit of a predetermined value to each of the bits to

be protected based on a bit sequence composed of a plurality of bits to be protected and a plurality of other bits, expanding the redundant bits to two bits so as to take the maximum value or the minimum value among four symbol values, and grouping the other bits into two bits so as to take four symbol values, and determining each of the symbols included in the signal; and ii) a communication quality determination means for determining the communication quality of a transmission path through which the signal is transmitted, based on the number of redundant bits included in each symbol determined by the symbol determination means that have the predetermined value or do not have the predetermined value. By having such a configuration, the invention described in Claim 7 has a unique effect that the communication quality of the transmission path can be determined by using the redundant bits added to protect each bit to be protected.

(2) Claims 8 and 9

Claims 8 and 9 are dependent on Claim 7.

(3) Claim 10

The invention described in Claim 10 is an invention of a method corresponding to Claim 7. The invention described in claim 10 has the same features as the invention described in claim 7.

4. Inventions described in Cited Documents

Cited Document 1 describes an invention in which, for example, when a call signal is transmitted at 6400 kbps / 4-value FSK, when the call signal traffic in the frame is small, in order to improve the reception characteristics, two phases in which the modulation signal can take only two states with the farthest inter-signal distance among the four states are used, and the call signal is substantially transmitted at 3200 kbps / 2-value FSK.

Cited Document 2 describes an invention in which the communication quality of a transmission path is determined by the number of error bits included in a known bit sequence known to both the transmitting side and the receiving side, such as a frame synchronization signal.

Cited Document 3 describes an invention in which the preamble included in the data burst of the communication partner station is registered as reference data in the reference data memory, and the preamble and the reference data included in the data burst received from the communication satellite are compared bit by bit from the beginning to calculate the error rate.

5. Comparison between the present invention and the invention described in the cited document

(1) Claim 7

As described above, the communication quality determination device according to the invention described in claim 7 of the present application is characterized in that I) a signal, which is a sequence of symbols formed by adding one redundant bit of a predetermined value to each bit to be protected based on a bit sequence composed of a plurality of bits to be protected and a plurality of other bits, expanding

each bit to two bits so as to take the maximum value or the minimum value among four symbol values, and grouping each of the other bits into two bits so as to take four symbol values, is acquired, and each of the symbols included in the signal is determined; and ii) the communication quality of the transmission path through which the signal is transmitted is determined based on the number of redundant bits included in each of the determined symbols that have the predetermined value or do not have the predetermined value, and the communication quality of the transmission path can be determined by using the redundant bits added to protect each of the bits to be protected. On the other hand, the radio call sign control device according to the invention described in Cited Document 1 only uses two phases in which the modulated signal can take only two states with the farthest inter-signal distances among the four states when the ringing signal traffic in the frame is small, for example, when the ringing signal is transmitted with a 4-value FSK, and does not add a redundant bit to each bit to be protected. As a result, there is naturally no disclosure or suggestion of using redundant bits to determine the communication quality of the transmission path. In addition, the communication control method according to the invention described in Cited Document 2 determines the communication quality of the transmission path by using a known bit sequence that is always necessary for transmitting a signal between a transmitter and a receiver, such as a frame synchronization signal. It is neither disclosed nor suggested in Cited Document 2 that the communication quality of the transmission path is determined by using redundant bits that are not necessarily required for signal transmission.

The error rate measurement device according to the invention described in Cited Document 3 determines the communication quality of the transmission path by using the preamble for identifying the communication partner station. Similarly to Cited Document 2, Cited Document 3 does not disclose or suggest that the communication quality of the transmission path is determined by using redundant bits that are not necessarily required for signal transmission. In contrast, in the invention described in Claim 7 of the present application, as shown in feature I), each bit to be protected is protected by adding a redundant bit to each bit to be protected, and as shown in feature ii), the communication quality of the transmission path through which the signal is transmitted is determined by using the redundant bit. The invention described in Claim 7 of the present application has a remarkably advantageous effect compared with the inventions described in Cited Documents 1-3 that the communication quality of the transmission path can be determined by using the redundant bits added to protect each bit to be protected. As explained above, the configuration and effect are completely different between the invention described in Claim 7 of the present application and the inventions described in Cited Documents 1-3, and it is difficult to conceive the configuration of the invention described in Claim 7 of the present application from the configurations described in Cited Documents 1-3. Therefore, the invention described in Claim 7 of the present application could not have been easily made by a person skilled in the art based on the inventions described in Cited Documents 1-3.

(2) Claims 8 and 9

Claims 8 and 9 are dependent on Claim 7. Therefore, Claims 8 and 9 have the same inventive step as Claim 7.

(3) Claim 10

The invention described in Claim 10 is an invention of a method corresponding to Claim 7. Therefore, it has a inventive step as in Claim 7.

6. Summary

As explained above, we believe that the reasons for refusal notified this time have been resolved, and we would appreciate it if you could make a decision to grant a patent after re-examination. Or more

 Inquiry of history information**Written Amendment (voluntary/content) (PatentsApplication2004-108399)***** NOTICES ***

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.

[Document Name]Written Amendment

[Reference Number]P07-975603

[Date of submission]November 10, 2008

[Recipient] Examiner of the Japan Patent Office: Yoshihiko Tanioka

[Indication of case]

[Application number]Japanese Patent Application No. 2004 / 108399

[Person who submits written amendment]

[Identification Number]000003595

[Name]Kenwood Corporation

[Representative]

[Identification Number]100095407

[Patent attorney]

[Name]Mitsuru Kimura

[Shipping number]541347

[Amendment 1]

[Document name for target of amendment]Patent Claims

[Item name for target of amendment]Full Text

[Amendment type]Change

[Content of amendment]

[Document Name]Patent Claims

[Claim 1]

A communication quality determination device comprising: a symbol determination unit that acquires a baseband signal representing a sequence of multilevel symbols and determines the symbols represented by the baseband signal; a communication quality determination unit that determines communication quality of a transmission path through which the baseband signal is transmitted, based on contents of the symbols determined by the symbol determination unit; and a data change unit that, when the communication quality determined by the communication quality determination unit does not satisfy a predetermined condition, makes a predetermined change to data to be transmitted represented by a symbol used for the determination, wherein the predetermined change includes a process of replacing the data to be transmitted represented by the symbol used for the determination that the communication quality does not satisfy the predetermined condition with past data represented by a symbol acquired in the past by the symbol determination unit.

[Claim 2]

The communication quality determination device according to claim 1, wherein the predetermined change further includes a process of substantially discarding the data to be transmitted represented by the symbol that follows the last replaced data and is used for determining that the communication quality does not satisfy the predetermined condition when the replaced data continues for a predetermined number of times or more.

[Claim 3]

The communication quality determination device according to claim 1, wherein the communication quality determination unit determines the communication quality of the transmission path based on the number of bits having the predetermined value among the redundant bits included in the symbol including the bit belonging to the protection target portion, and determines the communication quality of the transmission path based on a result of the determination, and wherein the predetermined change includes an attenuation process of changing the data to be transmitted represented by the symbol used for the determination that the communication quality does not satisfy the predetermined condition to data corresponding to data obtained by attenuating the variable represented by the data. the communication quality determination device according to claim 1, wherein the predetermined change includes an attenuation process of changing the data to be transmitted represented by the symbol used for the determination that the communication quality does not satisfy the predetermined condition.

[Claim 4]

The communication quality determination device according to claim 3, wherein when first data transmitted immediately before second data to be subjected to the attenuation processing has been

subjected to the attenuation processing, the attenuation processing to be performed on the second data includes processing of changing the second data to data corresponding to a variable represented by the second data attenuated at an attenuation ratio larger than an attenuation ratio of a variable represented by the first data.

[Claim 5]

A communication quality determination method comprising a symbol determination step of acquiring a baseband signal representing a sequence of multilevel symbols and determining the symbols represented by the baseband signal, a communication quality determination step of determining communication quality of a transmission path through which the baseband signal is transmitted on the basis of content of the symbols determined in the symbol determination step, and a data change step of, when the communication quality determined in the communication quality determination step does not satisfy a predetermined condition, making a predetermined change to data to be transmitted represented by symbols used for the determination, the data to be transmitted being represented by the symbols used for the determination that the communication quality does not satisfy the predetermined condition.

[Claim 6]

A symbol determination step of acquiring a baseband signal representing a sequence of multilevel symbols and determining the symbols represented by the baseband signal, a communication quality determination step of determining communication quality of a transmission path through which the baseband signal is transmitted on the basis of content of the symbols determined in the symbol determination step, and a data change step of applying a predetermined change to data to be transmitted represented by symbols used for the determination when the communication quality determined in the communication quality determination step does not satisfy a predetermined condition, wherein at least a part of a bit string constituting data to be transmitted represented by the string of symbols is distinguished as a protection target portion, at least a part of symbols belonging to the string of symbols includes a bit belonging to the protection target portion and a redundant bit having a predetermined value, and in the communication quality determination step, among redundant bits included in a symbol including a bit belonging to the protection target portion, a redundant bit having the predetermined value is included. Determining a communication quality of the transmission path based on a result of the identifying, wherein the data to be transmitted is constituted by data representing an intensity of a variable, and the predetermined change includes changing the data to be transmitted represented by a symbol used for determining that the communication quality does not satisfy the predetermined condition to data corresponding to data obtained by attenuating the variable represented by the data.

[Claim 7]

A communication quality determination device comprising: a symbol determination unit configured to acquire a signal that is a string of symbols configured by adding a 1-bit redundant bit of a predetermined value to each of a plurality of bits to be protected and a plurality of other bits based on a bit string configured by the plurality of bits to be protected and the plurality of other bits and expanding each of the plurality of bits to 2 bits so as to be able to take a maximum value or a minimum value of four symbol values for each of the plurality of bits to be protected, and grouping each of the plurality of other bits into 2-bit groups so as to be able to take four symbol values for each of the plurality of other bits, and determine each of the symbols included in the signal;

[Claim 8]

The communication quality determination device according to claim 7, further comprising a data change unit configured to, when the communication quality determined by the communication quality determination unit does not satisfy a predetermined condition, make a predetermined change to data to be transmitted represented by a symbol used for the determination.

[Claim 9]

The communication quality determination device according to claim 8, wherein the predetermined change includes a process of substantially discarding the data to be transmitted represented by the symbol used for the determination that the communication quality does not satisfy the predetermined condition when the number of redundant bits that are not the predetermined value among the redundant bits is equal to or greater than a predetermined number.

[Claim 10]

A communication quality determination method comprising: a symbol determination step of acquiring, based on a bit string including a plurality of bits to be protected and a plurality of other bits, a signal that is a string of symbols in which each of the bits to be protected is extended to two bits so as to be able to take a maximum value or a minimum value among four symbol values by adding a redundant bit of one bit of a predetermined value to each of the bits, and each of the other bits is collected for every two bits so as to be able to take four symbol values, and determining each of the symbols included in the signal;

[Amendment 2]

[Document name for target of amendment]Description

[Item name for target of amendment]TITLE OF THE INVENTION

[Amendment type]Change

[Content of amendment]

[Title of the invention]COMMUNICATION QUALITY DETERMINATION DEVICE AND COMMUNICATION QUALITY DETERMINATION METHOD

[Amendment 3]

[Document name for target of amendment]Description

[Item name for target of amendment]0001

[Amendment type]Change

[Content of amendment]

[0001]The present invention relates to a communication quality determination device and a communication quality determination method.

[Amendment 4]

[Document name for target of amendment]Description

[Item name for target of amendment]0010

[Amendment type]Change

[Content of amendment]

[0010]It is an object of the present invention to provide a communication quality judging apparatus and a communication quality judging method for judging communication quality with a simple configuration, accurately, or at high speed.

[Amendment 5]

[Document name for target of amendment]Description

[Item name for target of amendment]0011

[Amendment type]Change

[Content of amendment]

[0011]A communication quality determination device according to a first aspect of the present invention includes a symbol determination unit configured to acquire a baseband signal representing a sequence of multilevel symbols and determine the symbols represented by the baseband signal, a communication quality determination unit configured to determine communication quality of a transmission path through

which the baseband signal is transmitted, based on content of the symbols determined by the symbol determination unit, and a data change unit configured to, when the communication quality determined by the communication quality determination unit does not satisfy a predetermined condition, apply a predetermined change to data to be transmitted represented by a symbol used for the determination, and a communication quality determination unit configured to determine the communication quality of the transmission path based on a result of the determination.

[Amendment 6]

[Document name for target of amendment]Description

[Item name for target of amendment]0012

[Amendment type]Change

[Content of amendment]

[0012]The predetermined change may further include a process of substantially discarding the data to be transmitted represented by the symbol that follows the last replaced data and is used for determining that the communication quality does not satisfy the predetermined condition when the replaced data continues for a predetermined number of times or more.

[Amendment 7]

[Document name for target of amendment]Description

[Item name for target of amendment]0013

[Amendment type]Change

[Content of amendment]

[0013]A communication quality determination device according to a second aspect of the present invention includes a symbol determination unit that acquires a baseband signal representing a sequence of multilevel symbols and determines the symbols represented by the baseband signal, a communication quality determination unit that determines communication quality of a transmission path through which the baseband signal is transmitted on the basis of content of the symbols determined by the symbol determination unit, and a data change unit that applies a predetermined change to data to be transmitted represented by symbols used for the determination when the communication quality determined by the communication quality determination unit does not satisfy a predetermined condition. Alternatively, the number of symbols not having the predetermined value is specified, the communication quality of the transmission path is determined on the basis of the specified result, the data to be transmitted includes data representing the intensity of a variable, and the predetermined change includes an attenuation process of changing the data to be transmitted represented by the symbol used for the determination that the communication quality does not satisfy the predetermined condition to data corresponding to data

obtained by attenuating the variable represented by the data.

[Amendment 8]

[Document name for target of amendment]Description

[Item name for target of amendment]0014

[Amendment type]Change

[Content of amendment]

[0014]When first data transmitted immediately before second data to be subjected to the attenuation process has been subjected to the attenuation process, the attenuation process performed on the second data may include a process of changing the second data to data corresponding to a variable represented by the second data attenuated at an attenuation ratio larger than an attenuation ratio of a variable represented by the first data.

[Amendment 9]

[Document name for target of amendment]Description

[Item name for target of amendment]0015

[Amendment type]Change

[Content of amendment]

[0015]Further, a communication quality determination method according to a third aspect of the present invention includes a symbol determination step of acquiring a baseband signal representing a sequence of multilevel symbols and determining the symbols represented by the baseband signal, a communication quality determination step of determining communication quality of a transmission path through which the baseband signal is transmitted on the basis of contents of the symbols determined in the symbol determination step, and a data change step of, when the communication quality determined in the communication quality determination step does not satisfy a predetermined condition, making a predetermined change to data to be transmitted represented by symbols used for the determination, the data to be transmitted being represented by symbols used for determination that the communication quality does not satisfy the predetermined condition.

[Amendment 10]

[Document name for target of amendment]Description

[Item name for target of amendment]0016

[Amendment type]Change

[Content of amendment]

[0016]A communication quality determination method according to a fourth aspect of the present invention includes a symbol determination step of acquiring a baseband signal representing a sequence of multilevel symbols and determining the symbols represented by the baseband signal, a communication quality determination step of determining a communication quality of a transmission path through which the baseband signal is transmitted on the basis of content of the symbols determined in the symbol determination step, and a data change step of applying a predetermined change to data to be transmitted represented by symbols used for the determination when the communication quality determined in the communication quality determination step does not satisfy a predetermined condition. Alternatively, the number of symbols that do not have the predetermined value is specified, the communication quality of the transmission path is determined based on the specified result, the data to be transmitted is constituted by data representing the intensity of the variable, and the predetermined change changes the data to be transmitted represented by the symbol used for the determination that the communication quality does not satisfy the predetermined condition to data corresponding to data obtained by attenuating the variable represented by the data.

[Amendment 11]

[Document name for target of amendment]Description

[Item name for target of amendment]0017

[Amendment type]Change

[Content of amendment]

[0017]A communication quality determination device according to a fifth aspect of the present invention includes a symbol determination unit configured to acquire a signal that is a string of symbols configured by adding a 1-bit redundant bit of a predetermined value to each of a plurality of bits to be protected and a plurality of other bits on the basis of a bit string configured by the plurality of bits to be protected and the plurality of other bits and expanding each of the plurality of bits to 2 bits so as to be able to take a maximum value or a minimum value among four symbol values for each of the plurality of bits to be protected, and grouping each of the plurality of other bits every 2 bits so as to be able to take four symbol values for each of the plurality of other bits, and determine each of the symbols included in the signal, and a communication quality determination unit configured to determine communication quality of a transmission path through which the signal is transmitted, on the basis of the number of redundant bits that are the predetermined value or not the predetermined value among the redundant bits included in each of the symbols determined by the symbol determination unit.

[Amendment 12]

[Document name for target of amendment]Description

[Item name for target of amendment]0018

[Amendment type]Change

[Content of amendment]

[0018]The communication quality determination device may further include a data change unit that, when the communication quality determined by the communication quality determination unit does not satisfy a predetermined condition, makes a predetermined change to data to be transmitted represented by a symbol used for the determination.

[Amendment 13]

[Document name for target of amendment]Description

[Item name for target of amendment]0019

[Amendment type]Change

[Content of amendment]

[0019]The predetermined change may include a process of substantially discarding the data to be transmitted represented by the symbol used for determining that the communication quality does not satisfy the predetermined condition when the number of redundant bits that are not the predetermined value among the redundant bits is equal to or greater than a predetermined number.

[Amendment 14]

[Document name for target of amendment]Description

[Item name for target of amendment]0020

[Amendment type]Change

[Content of amendment]

[0020]Further, a communication quality determination method according to a sixth aspect of the present invention includes a symbol determination step of acquiring a signal that is a string of symbols configured by adding a 1-bit redundant bit of a predetermined value to each of a plurality of bits to be protected and a plurality of other bits on the basis of a bit string configured by the plurality of bits to be protected and the plurality of other bits and expanding each of the plurality of bits to 2 bits so as to be able to take a maximum value or a minimum value among four symbol values for each of the plurality of bits to be protected, and grouping each of the plurality of other bits every 2 bits so as to be able to take four symbol values for each of the plurality of other bits, and determining each of the symbols included in the signal,

and a communication quality determination step of determining a communication quality of a transmission path through which the signal is transmitted on the basis of the number of redundant bits having the predetermined value or not having the predetermined value among the redundant bits included in each of the determined symbols.

[Amendment 15]

[Document name for target of amendment]Description

[Item name for target of amendment]0021

[Amendment type]Change

[Content of amendment]

[0021]According to the present invention, a communication quality determination device and a communication quality determination method for determining communication quality with a simple configuration, accurately, or at high speed are realized.

 Inquiry of history information**Decision to Grant a Patent (PatentsApplication2004-108399)***** NOTICES ***

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.

Decision to Grant a Patent

Patent Application Number: Japanese Patent Application No. 2004 to 108399

Draft date: March 12, 2009

Examiner of Japan Patent Office: TANIOKA, Yoshihiko 3463 5K00

Title of the invention: COMMUNICATION QUALITY DETERMINATION DEVICE AND COMMUNICATION QUALITY DETERMINATION METHOD

Number of Claims: 10

Patent Applicant: Kenwood Corporation

Agent: Mitsuru Kimura

This application is to be granted a patent, since no reason for refusal has been found.

Assistant Examiner, Takayuki Yoshida, Yoshihiko Tanioka, Katsufumi Hikoda 9077 3463, 9182

1. Distinction of Patent: Usually
2. Reference: see below
3. Application of Patent Act Article 30: not applicable

4. Change of the Title of the Invention: No

5. International Patent Classification (IPC)

H04L 1/20

6. Bacterial deposit

7. Indication that the retroactivity of the filing date is not permitted

References

Patent Application Number: Japanese Patent Application No. 2004 to 108399

1. Fields investigated (IPC, DB name)

H04L 1/20

2. Reference Patent Documents

Japanese Unexamined Patent Application Publication No. 220762 / 1999 (JP, A)

Japanese Unexamined Patent Application Publication No. 05 / 260021 (JP, A)

Japanese Unexamined Patent Application Publication No. 05 / 284147 (JP, A)

3. Reference books and magazines