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Process and Device to Transmit Information

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This invention pertains to a process and a device to transmit information from a transmitter to a receiver.

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Processes and devices of this type are known from the prior art and are used in modern mobile telephones, for example. In these mobile telephones, for example, specific symbols are selected by the user of the transmitting mobile phone when transmitting an SMS message. Such symbols in the prior art in general include the standard symbols "+", "-", ".", ",", ":", ";", "'", "?", "!", "*", "/", "(", ")", "<", "=", ">", "%", "&", "\$", "%", and "@". These symbols are then transmitted as a symbol.

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In addition to voice transmissions, there is also the known process of so-called SMS (short message service) transmission of short messages. We refer here to Connect 8/99, page 30 et seq., for example. According to this reference, short messages can be sent via mobile phones (transmitters) via a short message switching station of a service provider to another mobile telephone (receiver). Voice messages can also be sent using these types of short message services.

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However, a known disadvantage to prior art mobile telephones and in the known processes and devices of the prior art to transmit information from one mobile telephone to another mobile telephone is that the information, e.g. a symbol or a sequence of tones, are transmitted as such.

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This means that in the transmission of audio information through electromagnetic transmission, e.g. when transmitting using electromagnetic waves such as is common in mobile

telephones, the audio signals themselves are transmitted. In other words, they are converted to and sent as modulations of the transmission frequency. The result is that the prior art requires a considerable amount of data to transmit audio signals. Thus, for example, in digital transmission each individual audio signal must be converted to a sequence of bits, and then this bit information must be conveyed. These enormous amounts of data required in turn require a certain amount of time to transmit, which extends or delays the transmission.

During transmission of the information, this requires a considerable amount of data. This in turn results in a considerable amount of time to transmit the information.

However, the users of mobile phones have a large demand for the ability to transmit other information without their phone bills exceeding the fee schedule, that is, without an excessive amount of time needed for the transmission.

The objective of this invention is thus to further develop a process and device of the type mentioned above that will do away with the above disadvantages such that it is possible to transmit information with minimum time usage as well as providing an expanded information transfer.

This objective is met through a process with the features cited in claim 1 such that a symbol (picture) is selected by the transmitter, a character string is determined at the transmitter associated with the symbol, the character string associated with the symbol is sent to the receiver, the character string is converted at the receiver to the associated symbol, and that the symbol is displayed on a display unit and at the same time at least one audio sequence associated with the symbol is acoustically replayed.

The particular advantages of this procedure according to this process are that from this point on, the invention requires that only the character string has to be transmitted from the transmitter to the receiver. Thus, for example, only the word
5 "sun" has to be transmitted when a user of a device that implements this process selects the symbol for a sun and its associated audio sequence for transmission, and not the symbol and the audio sequence themselves. The transmission of the word "sun" requires much less transmission time so that the
10 transmission can proceed faster and less expensively. At the receiver, the character string is then in turn converted to the symbol associated with it so that the receiver of the message then sees a symbol for a sun on his display or other means.

15 By the simultaneous acoustic replaying of the audio sequence associated with the symbol, it is possible in an advantageous manner to simultaneously initiate background music in addition to the initiation by the transmitter of the display of
20 pictures at the receiver. This also draws attention to the receiver by the fact that the background music can be heard even if the receiver is not in plain view at the moment. Furthermore, this provides the added advantage of triggering emotions, memories, thoughts or the like in the person
25 receiving the symbol as a result of the background music.

In a preferred embodiment, the particular symbol can be selected at the transmitter from a table of symbols. For example, this can be done with the help of a display. Thus,
30 for example, the user of a mobile telephone can select, from an entire series or from tables of symbols, a particular symbol that he wishes to transmit. The mobile telephone then internally converts the selected symbol to the corresponding word or character string and transmits this character string.
35 With the help of such a table of symbols, the selection of symbols is considerably easier for the user to do. It is

preferred that the symbols or the tables of symbols be stored in a memory in advance.

5 In another preferred embodiment, the selection of symbols and/or the association of the character string to the selected symbol and/or the transmitting and receiving of the character string are controlled by a microprocessor. Preferably, this permits the process to be implemented using a device that contains the memory for storing the table of symbols and
10 associated character strings, the microprocessor and the input device or keypad, all integrated onto a single circuit board. This allows the process to be implemented completely in modern mobile telephones, since there is no need for any additional provisions that may or may not be possible to integrate into
15 known mobile telephones. The process according to the invention and the device according to the invention to transmit symbols from a transmitter to a receiver can therefore be implemented fully in today's mobile telephones.

20 Also preferred is a process in which an identifier is added to the character string when it is transmitted by the transmitter. This identifier serves to differentiate the character string from other character strings that do not represent a symbol. Thus, for example, when transmitting the
25 sun symbol mentioned above, first the sun symbol is converted to the word "sun" and then it is provided with an identifier, such as the label "#", for example. The character string thus provided with the identifier "#" is then sent by the transmitting unit of the transmitter. At the receiver, it is
30 now possible, because of this identification of the character string, to differentiate normal character strings from those character strings that encrypt a symbol. This is because in a preferred embodiment it is possible for the receiver to recognize whether a character string contains the identifier that identifies it as an encrypted symbol or not. If the
35 character string has no identifier that identifies it as an

encrypted symbol, it is processed at the receiver or displayed to the user of the receiving mobile telephone as the character string itself. If, however, it is an identified character string, the receiving unit recognizes that it is an encrypted symbol and searches for the corresponding symbol associated with it and its associated audio sequence in a table that is stored in a memory. As soon as the symbol and the audio sequence have been found at the receiver, the symbol can be displayed and the audio sequence can be played. Thus, the user at the receiver does not notice that only the character string had been transmitted, but sees the symbol and hears the audio sequence directly and gets the feeling that the symbol and the audio sequence themselves had been transmitted.

Also, the process can be implemented at the receiver using a microprocessor that controls the accessing of the tables of symbols and audio sequences and associated character strings from memory and that also controls the receiving unit of the receiver and if applicable also the display unit that displays the symbol that is ultimately determined and the playback unit that plays the audio sequence.

In an especially preferred embodiment, a microprocessor processes an algorithm stored in a memory when it is to convert a symbol to a character string. This makes the table unnecessary in this embodiment. This association of character string to symbol and audio sequence using an algorithm can also be carried out at the receiver to assign a symbol/audio sequence to the character string. Another embodiment of the invention performs the encryption according to the invention only at one end. This means that in this embodiment the process encrypts the symbol or reproduces the encrypted symbol and the audio sequence only at one end, that is, only at the receiver or only at the transmitter. For example, this means that in this embodiment, when the user is transmitting, only the character string is entered. In the process, it is

preferred that the user can provide this character string with an identifier. Then, the identified character string is sent by the transmitter to the receiver. In this case, then, only the receiver is able to convert the identified character string to the corresponding symbol and the corresponding audio sequence. This can be the case for example, if only the receiving mobile telephone is equipped with the corresponding display/playback devices that allow a display of a symbol or a playback of an audio sequence, whereas the transmitting mobile telephone does not allow a display of the symbol or an audio playback.

In the opposite case, the transmitter is able to convert the symbol to a character string, whereas it is not possible to do this at the receiver. In this opposite case, therefore, only the transmitter can convert the selected symbol to a character string, whereas at the receiver the character string can only be displayed. In the example illustrated above, therefore, the user of the transmitting mobile telephone would select the sun symbol, the sun symbol is then converted to the "sun" character string according to the process of the invention as per the assignment table and this character string is then sent. At the receiver, which for example lacks the display capability for the sun symbol, the character string itself is then displayed.

In another embodiment of the invention, the process or the device according to the invention recognizes the language in which the selected symbol is to be encrypted prior to the encryption of the selected symbol. If applicable, the user is able to set the language. In mobile telephones, this means, for example, that in a mobile telephone that is owned by a German-speaking user or in which the German language is set as the transmitting language by the user, the sun symbol is transmitted as the word "Sonne". If, however, the mobile phone user is an English speaker, or if the English language is

selected by the user, the sun symbol is transmitted as the character string "sun". In another embodiment, all important languages of the world are programmed into memory. The transmitting telephone then transmits in the language established in the transmitting telephone, whereas the receiving telephone then searches for the language just received in the various tables stored in memory using the microprocessor, and then displays the symbol selected by the transmitter.

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In another embodiment, the transmitter is a telephone and the receiver is a personal computer (PC) or a fax device. The transmitted symbol is then displayed on the PC or printed by the fax.

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Other advantageous configurations of the invention can be found in the remaining subordinate claims.

This invention is explained in more detail in the embodiments below with the help of the associated figures. Shown are in:

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Figure 1 a schematic arrangement of a transmitter and a receiver to transmit individual symbols (individual pictures);

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Figure 2 a block diagram for transmitting individual symbols with background music;

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Figure 3 a block diagram for receiving individual symbols with background music, and

Figures 4 through 28 other possible symbols that can be transmitted using the process, shown schematically.

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Figure 1 schematically shows an arrangement 10 to transmit individual symbols (individual pictures) with background music

from a transmitter 12 to a receiver 14. Transmitter 12 and/or receiver 14 can for example be mobile telephones, PCs, fax machines, communicators, laptops, notebooks or the like. It is also conceivable to use end devices (telephones) attached to telecommunications systems that are suitably equipped. In the following exemplary embodiment it is assumed that the transmitter 12 and the receiver 14 are each mobile telephones. However, the functions described apply independently to the other devices cited and are within the scope of protection of the invention.

First of all, it is assumed that a person operating the transmitter 12 would like to send to the person in possession of the receiver 14 a symbol (picture) with a musical background. To this end, the person operating the transmitter 12 calls up a picture (also called a symbol below) from a memory means 16 in a manner that will be explained below. In addition, information can, but does not have to, be called up that triggers the playback of at least one audio sequence at the receiver, in addition to the display of the picture.

The symbol and if applicable the information that triggers the replay of the audio sequence is prepared at the transmitter using a microprocessor 18 and is transmitted as a short message 22 to a service provider 24 via a transmitting and receiving unit 20. Service providers 24 are for example operators of mobile phone systems, such as C-networks, D-networks, E-networks or others. The transmitting of a short message 22 via a service provider 24 to a selected receiver 14 is a generally known process, so that there is no need to go into any more detail in this regard in this description.

The symbol (picture) and if applicable the short message 22 that represents the triggering information that plays back the audio sequence is transmitted to the receiver 14 via the service provider 24. The receiver 14 recognizes - in a manner

also to be explained - in the short message 22 that a symbol (picture) is to be displayed together with background music. When the short message 22 is accessed by the receiver 14, which does not necessarily have to occur immediately, but can occur at a later time as well, the corresponding picture is displayed on a display unit 26 when the receiver 14 recognizes the symbol (picture) by means of a microprocessor 18 that it also possesses and that cooperates with a memory means 16. At the same time, the audio sequence associated with the picture is replayed over a loudspeaker 27 as a melody, and if applicable with singing.

Figure 2 illustrates in a schematic block diagram the transmitting of individual symbols with background music. The same parts found in Figure 1 are given the same reference numbers and are not explained again. Using an operator interface 28, which is made up of an alphanumeric keypad, for example, the available options for the transmitting of symbols with background music can be shown on the display unit 26. This representation can be menu-driven by showing the available options individually, sequentially or continuously by pressing the corresponding buttons on the operator interface 28. In the exemplary embodiment illustrated, it is assumed that the symbol to be transmitted is an arrow pointed at a heart. This picture is stored in the memory means 16 under the ordinal number "1", for example. A character string is associated with each of the symbols, which correspond approximately to pictorial symbols. This association can be stored in the schematically represented tabular form in the memory means 16. For example, the character string "Herza" is assigned to picture "1".

Furthermore, the memory means 16 also assigns the symbols to background audio sequences (music). Here, for example, to each symbol (picture) is assigned a selection of two possible audio sequences "m1" or "m2". Each of these abbreviations "m1" and

"m2" triggers the playback of a particular audio sequence associated with it when the picture is transmitted to the receiver - as explained below. According to the example illustrated, either audio sequence "m1" or "m2" can be selected. According to other exemplary embodiments, there can also be only one audio sequence "m", or there can be a multitude of audio sequences "m1" to "mx" associated with each picture.

10 If this arrow pointed at the heart is now transmitted as a picture with background music to a receiver 14, the transmitting and receiving unit 20 is operated via the microprocessor 18 such that the character string "Herzam1" is sent as a short message.

15 At the receiver, this short message is conveyed by its transmitting and receiving unit 20 to the receiver's microprocessor 18. This microprocessor determines first of all the associated picture symbol and its associated audio sequence by reading from its memory means 16 likewise located at the receiver. By operating the display unit 26 and the loudspeaker 27 at the receiver 14, the picture "1" can then be displayed and at the same time the audio sequence (music) that corresponds to the character string "m1" can be played. For an observer of the display unit 20 at the receiver, this results in the arrow aimed at the heart appearing as a stationary picture accompanied by the simultaneous sound of the associated melody. The melody as such can consist of an arbitrary audio sequence that is established in advance and is stored in the memory means 16 of the receiver. Audio sequences considered here include a simple sequence of tones, complex melodies and/or melodies together with singing. A concrete example of this could, for example, be the intonation of the "wedding march" as a melody accompanying the display of the arrow aimed at the heart.

In order to identify the short message 22 for the receiver as being a transmission of a symbol (picture) with an audio sequence, there can be an additional identification, for example using the key "#", so that the short message then consists of the character string "Herzaml#".

Figure 3 again illustrates schematically the receipt of the short message 22 at the receiver 14. By means of the transmitting and receiving unit 20, the microprocessor 18 receives the short message 22 and conveys it to the memory unit 16. By uniquely assigning speech expressions to the symbols and assigning the character string "m" to the audio sequences, the individual symbol (picture) that corresponds to the received short message 22 can be displayed on the display unit 26 and at the same time the associated audio sequence can be replayed via the loudspeaker 27.

The microprocessor circuit 18 can include a loop circuit, through which the information transmitted as short message 22 and converted to the sequence of pictures and audio sequences by the memory unit 16 are displayed and replayed in succession repeatedly. This can continue until the display and the playback is interrupted or stopped by the person operating the receiver 14.

The short message 22 and thus the display of the pictures and playback of the audio sequences can be accessed either immediately after receipt of the short message 22 or later. To this end, the message is stored temporarily until the person operating the receiver 14 accesses it.

In Figures 4 through 28, other examples of symbols are shown that can be transmitted by the process according to the invention. In the figures the available symbols (pictures) that can be transmitted are shown to the left, while to the right are the associated speech expressions. Each of the

ordinal numbers "1", "2", "3"... "x" shown in Figures 2 and 3 corresponds to one of the symbols shown in these figures with its associated character string (if applicable depicted as a legible word - as shown). Prior to transmitting, the
5 respective symbol is converted to the corresponding character string and the desired audio sequence "m" is selected.

The exemplary embodiment or embodiments illustrated do not represent the complete scope of the invention. Thus, of
10 course, any arbitrary symbol can be combined with any arbitrary audio sequence. In addition, the variations of the conversion of the symbols into the character strings mentioned in the introductory description and vice versa and in addition
15 with translation into another user language is possible, if applicable.

Claims

- 5 1. A process to transmit information from a transmitter to at least one receiver, characterized in that a symbol (picture) is selected at the transmitter, a character string is determined at the transmitter associated with the symbol, the character string associated with the symbol is sent to the receiver, the character string is converted at the receiver to the associated symbol, and that the symbol is displayed on a display unit and at the same time at least one audio sequence associated with the symbol is acoustically replayed.
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- 15 2. A process according to claim 1, characterized in that the symbol is selected at the transmitter from a table of symbols.
3. A process according to one of the previous claims, characterized in that the symbol is accessed from a memory at the transmitter, the symbol having been stored in the memory prior to its being accessed.
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4. A process according to claims 2 and 3, characterized in that the table of symbols had been previously stored in the memory of the transmitter.
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5. A process according to one of the previous claims, characterized in that the symbol is selected at the transmitter using a microprocessor operated by an input unit.
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6. A process according to one of the previous claims, characterized in that the character string associated with the symbol is determined at the transmitter using a microprocessor.
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7. A process according to claim 6, characterized in that the character string is determined at the transmitter by the microprocessor with the help of an algorithm previously stored in a memory.

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8. A process according to one of the previous claims, characterized in that the character string is determined at the transmitter with the help of a table of symbols and associated character strings.

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9. A process according to claims 6 through 8, characterized in that the table is accessed by the microprocessor from memory.

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10. A process according to one of the previous claims, characterized in that the character string associated with the symbol is a character string that corresponds to the symbol and/or names the symbol.

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11. A process according to one of the previous claims, characterized in that an identifier is added to the character string at the transmitter prior to transmitting the character string, said identifier identifying the character string as an encrypted symbol, wherein the identifier is sent together with the character string.

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12. A process according to one of the previous claims, characterized in that the symbol and the audio sequence associated with the received character string are determined at the receiver with the help of a table of character strings and associated symbols and audio sequences.

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13. A process according to one of the previous claims, characterized in that the symbol and the audio sequence associated with the received character string are accessed from a memory at the receiver, said symbol and audio sequence

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having been stored in the memory prior to their being accessed, together with the character string.

5 14. A process according to claims 12 and 13, characterized in that the table of character strings and associated symbols and audio sequences had been previously stored in the memory.

10 15. A process according to one of the previous claims, characterized in that the symbol and audio sequence associated with the received character string are determined at the receiver automatically by a microprocessor.

15 16. A process according to claim 15, characterized in that the symbol and audio sequence associated with the received character string are determined at the receiver by the microprocessor with the help of an algorithm previously stored in a memory.

20 17. A process according to one of claims 15 or 16, characterized in that, at the receiver, an associated symbol and an associated audio sequence is determined only in those received character strings that include an identifier, and said identifier identifies them as an expression of an encrypted symbol.

25 18. A process according to one of the previous claims, characterized in that the symbol determined at the receiver is displayed on a display unit.

30 19. A process according to one of the previous claims, characterized in that the audio sequence (of which there is at least one) associated with the symbol is permanently assigned at the receiver.

20. A process according to one of the previous claims, characterized in that the audio sequence replayed at the receiver can be influenced by the transmitter.
- 5 21. A process according to one of the previous claims, characterized in that a number of audio sequences are stored at the receiver, of said audio sequences at least one can be accessed by the transmitter.
- 10 22. A device to transmit information from a transmitter to at least one receiver, characterized in that a microprocessor is assigned to the transmitter and to the at least receiver that cooperates with at least one memory means, and that in the at least one memory means are stored a number of symbols
15 (pictures) with associated character strings and at least one audio sequence associated with a symbol, and with a display unit to display the symbols, and with an acoustic playback unit to replay the at least one audio sequence, and with a transmitting and receiving unit to transmit the character
20 strings.
23. A mobile telephone, characterized by a device according to claim 22.
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