(54) Title: A METHOD, A SYSTEM AND A RECEIVER FOR COMMUNICATING A TELEVISION SCREEN IMAGE TO A DEDICATED ENTITY

(57) Abstract: The present invention is a method and a system for receiving screen image e.g. via a system for broadcasting teletext. According to the invention, the traditionally broadcast teletext signal comprising strings of text to be inserted sequentially into a teletext image of a TV is converted into a combination between data and acommands. The commands specify the arrangement of the text in a screen and thus allow broadcast of the teletext image with the use of less bandwidth. The invention further relates to a receiver for receiving the signal with the commands and for converting it back into a teletext image to be displayed on the TV.

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A METHOD, A SYSTEM AND A RECEIVER FOR COMMUNICATING A TELEVISION SCREEN IMAGE TO A DEDICATED ENTITY

Field of the invention

The present invention relates to a method and a system for broadcasting and receiving dedicated teletext information. Moreover, the invention relates to a teletext receiver for receiving images.

The teletext receiver is connected to a TV-device and the connection enables the TV to receive and decrypt encrypted teletext pages. The invention thus enables an owner of a TV to receive personal teletext pages on his or her TV-device.

Background of the invention

Existing teletext receivers are intended for receiving general information that can be received by all persons who own a TV set with a teletext receiver. These teletext receivers are encapsulated in the TV and they are characterized in that they can display teletext pages which are specific for the TV-channel the TV is tuned to. Systems exist in which it is possible to request information dedicated for a specific end-user. The requested information is, however, not broadcast encrypted and can as such be viewed by anybody. Broadcasting of individual or personal information is therefore not desirable for most users, and these systems are mainly used for non-sensitive services such as real estate advertisements or classified advertisement columns in general. Few systems have been developed where encrypted teletext pages are sent to a receiving entity which decrypt the page and display the teletext page on a pre-specified channel. While such systems make it possible to broadcast personal information, the international teletext standards (CCIR Teletext System B and World System Teletext standard) are used to broadcast the teletext. These standards, however, limits the possibilities of using the bandwidth optimally. Using the international teletext standards necessitate to send the teletext pages character by character as they should be viewed on the TV screen. This is a highly inefficient way of using the limited bandwidth allocated to each broadcaster, and, when dedicated information is forwarded to individual entities, the broadcaster may soon run out of capacity.
It is an object of a preferred embodiments of the present invention to provide a method, a system as well as a receiving entity for efficiently and safely to display personal teletext pages on a regular TV-device.

According to a first aspect, the present invention relates to a method for transmitting a television screen image to a dedicated entity, said method comprising the steps of:

- transforming a first signal representing data defining the screen image into a second signal representing a combination between data and commands which commands control formatting of the data so as to define the same screen image,
- broadcasting the second signal, and
- receiving the broadcast signal by a number of entities, and where the second signal is transformed into a screen image which is visible on a TV-device.

The broadcaster may be any television channel such as a national public service channel or a pay channel. The first signal could represent data defining a screen image dedicated to a specific user. The signal could comprise bank account information, personal e-mails, etc. Before broadcasting the signal it is transformed into a format used for broadcasting, during this process the data is converted into a combination between data and commands representing the same screen image. The commands can be read by the receiving entity.

According to the invention, the traditionally broadcast teletext signal comprising strings of text to be inserted sequentially into a teletext image of a TV is converted into a combination between data and commands. The commands specify the arrangement of the text in a screen and thus allow broadcast of the teletext image with the use of less bandwidth.

The second signal may further include an identifier of the entity to which the signal is dedicated and, correspondingly, this identifier may be compared with a reference identifier of the entities receiving the second signal. Due to the inclusion of an identifier, it is possible for a broadcaster to broadcast personal information to a large group of entities, information which may only be read by a dedicated entity, i.e. the entity having a reference identifier corresponding to the identifier included in the second signal.

In a preferred embodiment of the present invention, nothing is broadcast until a first signal is received. This first signal contains data from which a screen image can be constructed. The data may be in any format, e.g. it may be received as a series of XML codes or HTML codes. The data contained in the first signal is extracted and a second signal is generated. This second signal is then broadcast. The format of the second signal will be elaborated upon shortly, the main aspect of this second signal is that the screen images is transmitted as a series of data in combination with commands. The second signal may be broadcast either as a standard airborne signal emitted from an aerial mast,
via satellite to be received by a parabola antenna, via cable, or via a combination of these or any other broadcasting methods.

The generation of a second signal based on the first signal, and successively a broadcasting of the second signal, may be conditioned upon receiving a request signal from a user. The request signal may comprise data which determines the contents of the screen image, thus the content of the first signal may be influenced or determined by the contents of the request signal.

In a preferred embodiment of the present invention, the request signal, and thereby the contents of the screen image, is controlled by a user operating a telephone. The elements of the request signal may be conditioned upon the numbers pushed or dialled by the user of the telephone. Most push-button telephones send out DTMF tones when a button is pushed, these DTMF tones may be used as inputs to construct the first signal. The advantages of the telephone as a control unit is, that the system is operated with a limited number of keys, as well as the output is consistent and unambiguous. The contents of the request signal may, however, also be provided in the form of an SMS sent from a telephone capable of sending out such messages, or it may be provide by sending an e-mail. The screen image could preferably be sustained as long as the telephone connection is sustained and preferably not longer. This will force the end-user to keep the line open for as long time as it takes to comprehend the image and thus allows the system provider means for charging the user for the use of the system.

To increase certainty that only persons who are entitled to access the information broadcast to the specific entity, the broadcasting could further be conditioned upon an identification of the person requesting the broadcasting. If the broadcasting is requested from an ordinary telephone, an identification may be provided by transmitting an access code and a password entered via the telephone. If the request is sent from a telephone equipped with a SIM lock, the identification may be read directly from the identification included in the telephone signal.

The screen image may be broadcast in the form of a teletext page which conforms to an international teletext standard, e.g. CCIR Teletext System B, World System Teletext standard or the European Telecommunication Standard document number ETS 300 706 may 1997. In these teletext standards a teletext page is built up of packets that are broadcast in a loop. Each packet contain 42 bytes, where the two bytes are reserved for magazine and row address. In the first 25 packets the last 40 bytes correspond the teletext page, character by character as it will be viewed on the TV screen. The following 7 packets are not displayed on the teletext page and cannot be viewed at such with a standard TV equipped with a teletext receiver. These last packets are normally referred to as the extension packets.
The first signal may be converted into a signal with reduced information content in an, for the available set of commands, unambiguous format. The converted signal thus represents a screen image which is possible to describe with the available commands.

At the receiving entity's site, an extension packet may be converted into a standard broadcasting format of a teletext-page. This has the advantage, that a standard TV-set can be used for visualising the screen image. The screen image defined in the second signal may be broadcast via a single extension packet, via a set of extension packets or via all packets. Normally the first 25 packets are reserved for broadcasting teletext pages, some of the extension packets may also be reserved for certain purposes. For example, if extension packet number 31 is not reserved by the broadcaster this could be used. In a preferred embodiment, the identifier of the broadcast signal is included in each packet intended for defining the screen image. In this case, the entity scans all packets which are broadcast for a corresponding identifier, if the identifier of the receiving entity matches the identifier included in the packet, the extension packet is read. In this embodiment it is not important for the receiving entity to know in which extension packet the screen image is broadcast.

In order to improve the security of the system, in particular, the security that only the dedicated entity is capable of visualising the screen image, the second signal may be encrypted by the use of an encryption key known to the dedicated entity.

According to a second aspect, the invention relates to a system for transmitting a television screen image to a dedicated entity, said system comprising:

a first transmitting unit having

- transforming means for transforming a first signal representing data defining the screen image into a second signal representing a combination between data and commands which commands controls formatting of the data so as to define the same screen image, the second signal further representing an identifier of the entity,

- broadcasting means for broadcasting the second signal, and

a second receiving unit having

- receiving means for receiving the broadcast signal, and

- processing means for comparing the identifier with a reference identifier, and based upon the comparison, for transforming the second signal into the screen image.

The system may be adapted to operate in accordance with any of the previously described features for the invention according to the first aspect.

According to a third aspect, the present invention relates to a teletext receiver for connection to a TV-signal input channel of a TV-device. The receiver being adapted to
receive and process a broadcast signal comprising information which is addressed to
specific entity and which comprises commands in the form of instructions for the receiver
in order to generate a screen image to be transmitted to the input channel of the TV-
device.

The received broadcast signal could be a signal representing series of bytes and the
signal could be synchronised with a video signal. This is in accordance with European
Telecommunication Standard document number ETS 300 706 may 1997, describing the
use of the vertical blanking interval (VBI) for transmission of teletext data.

The broadcast signal may be received by the receiver either as a regular antenna
signal, i.e. as a radio frequency signal or it could be a CVBS signal (composite video base
band signal). Likewise, the receiver could forward the generated teletext page to the input
channel of the TV-device in the form of a regular antenna signal for input into an antenna
socket of the TV-device, or in the form of a CVBS signal, e.g. for a euroscart or similar
socket of the TV-device.

If the received and transmitted signals, respectively, are antenna signals, the receiver
should have a tuner and a modulator for conversion of the received and transmitted
signals, respectively.

The receiver could be provided with a memory module for storing a reference
identification insignia, e.g. an insignia which uniquely identifies the receiver. Upon
recognition of a corresponding identifier in the received signal, the receiver processes the
corresponding commands comprised in the signal.

Preferably, the receiver is adapted to receive a teletext-signal which conforms to the
international teletext standards, e.g. a signal which is comprised in the so-called extension
packets of the teletext-signal, i.e. packets which by a regular teletext receiver would not
be recognised as being intended to be visualised in a screen image.

As mentioned above, the teletext receiver could have receiving means for converting
between an antenna signal and a CVBS signal. However, in order to simplify the design of
the receiver, the receiver could be connected to a corresponding out-put channel of a TV-
device from which the receiver receives teletext data in series of bytes, i.e., in pre-
processed form compared with an antenna signal. In this case, the receiver depends on
the availability of a CVBS signal out-put socket of the TV-device but most modern TV-
devises are provided with such a socket, e.g. in the form of a euroscart socket. That is, the
TV-device receives the broadcast signal as an antenna signal which is converted into a
CVBS signal. The CVBS signal is send to the receiver wherein the commands comprised in
the signal is used for generating a teletext page. This page is returned as a CVBS signal to
the TV-device for visualisation. The returned video signal could either correspond to the
received video signal with the image inserted into the vertical blanking interval, or the
returned video signal could be a black-level video signal with the image inserted into the
vertical blanking interval.
According to a fourth aspect, the present invention relates to a data signal conformed to the European telecommunication standard for non-displayable packets, said data signal comprising commands arranged within the last 39 bytes of the packet. Preferably, the commands are selected from the group consisting of commands to: display strings, clear strings, colour text, colour background, clear screen area, end session, detect a present service, instruct a receiver to transmit to a TV-device system relevant information, set font type and to set font size.

**Detailed description**

In the following, the invention will be described in further details with reference to the drawing in which:

Fig. 1 shows an overview of a system according to the present invention,

Fig. 2 shows schematic view of a receiver, and

Fig. 3 shows a functional diagram of a teletext signal.

In Fig. 1, a first signal 1 is provided from a content provider 2, e.g. a bank, a mail-host, betting service or a corporation of any kind, to a first transmitting unit 3. The first transmitting unit is adapted transform the received first signal (in the following also referred to as TVML format) into a number of commands (in the following also referred to as "TLV commands") defining a screen image to be broadcast. The first unit may be housed e.g. at the broadcaster site or, in fact, at any location from which the unit is connected to the broadcaster via regular connection means, e.g. via the Internet. The transformed signal, i.e. the second signal, is forwarded to be broadcast via traditional broadcast means 4. In the broadcast means, the second signal is inserted into a standard video signal, e.g. via a standard teletext inserter 5 before the signal is transmitted via antenna 6, a satellite based transmission system 7 or via a cable based transmission system 8. At an end-user 9's site, the transmitted signal is received via regular means compliant with the transmission channel. The received signal is entered into a receiving unit 10. The receiving unit is described in further details with reference to Fig. 2. In the receiving unit, the commands are converted into the screen image which is forwarded to a TV-device such as a regular television, a computer or a VCR etc. In order to initiate the transmission of the first and second signals, the end-user may have signal requesting means, e.g. in the form of a telephone connection for calling the content provider or the
transmitting unit, e.g. a voice response server \textbf{11} connected to the transmitting unit. After receiving a request from the end-user, the transmitting unit forwards the request to the content provider, e.g. via the Internet and receives the first signal in response.

5 Considering the system as shown in Fig. 1, the following description provides an example of a method according to the present invention for distributing e-mails via a broadcast system.

A user decides to check his email on the system. He turns on his \textit{TV}, which is equipped with a receiving unit and tunes to the broadcaster channel. He picks up a phone and dials the access number.

1. The Voice Response Server greets the user and asks for userID and PIN. These are keyed in by the user on the numeric keypad of the phone.

2. The Voice Response Server initiates a network session with the transmitting unit, and requests a verification of the user login.

3. The transmitting unit verifies the user against the end user database and initiates a session with the Teletext Inserter covering the broadcasting segment where the user is located. (the identification of the broadcasting segment is done by each segment having a different dial-in access number for the users to call).

4. The transmitting unit reads the user menu, i.e. the first signal, preferably in a specific data format, e.g. a subset of Extendable Markup Language, XML, in following TVML format, from the database and converts the user menu to a series of TLV commands. Subsequently, the server encapsulates the TLV commands into a command section and encapsulate the command section into VBI broadcast ready packets. In this step, the target identifier of the end-user is added and the signal may optionally be encrypted.

5. The transmitting unit then transmits the broadcast ready VBI packets to the Teletext Inserter, which in turn inserts the packets in the outgoing broadcast video signal.

6. The end user receiving unit receives the video signal, extracts the packets, checks the target address against its own address and upon matching addresses, starts processing the packet contents: First a packet integrity check, using error correction methods if any errors, then a decryption phase, using the built-in decryption method and key and then a decapsulation of TLV commands from the command section.

7. The TLV commands are then executed in turn to build the resulting screen image, which is in turn delivered to the attached television set as a standard teletext data stream inserted onto a carrier video signal.

8. The TV set displays the screen image using the built-in teletext decoder.
9. The end user now sees a menu on his screen and is able so select menu items by pressing the corresponding key on his phone. The user selects item #1, "email" by pressing the "1" key on his phone.

10. The Voice Reponse server detects the keypress and sends a command to the transmitting unit indicating that the user pressed "1".

11. The transmitting unit interprets the "1" in relation to the menu previously transmitted, and executes the TVML hyperlink matching item #1 on the menu. In this example, item #1 corresponds to a script which causes the transmitting unit to connect to an email server defined in the user settings, extract mail headers, convert email headers into TVML format, adding TVML hyperlink information for subsequent selection of individual emails.

12. The TVML document containing mail headers and link information is now processed through the steps of converting to TLV commands, section encapsulation, addressing and encryption and formatting onto VBI broadcast ready packets. Those are then transmitted to the Teletext Inserter.

13. In this fashion, the end user can peruse his mailbox contents, scroll information, read emails, respond to e-mails and create new emails.

20 Fig. 2 shows a receiving unit comprising the following major components:

- A euroscart interface 26 for input/output of a video signal. The euroscart connector ensures a stable shielded and grounded connection between the receiving unit and the television set. In one embodiment of the invention, the actual euroscart plug is a combination male-female connector, providing a pass-through connection for television sets with only one scart socket, in a switched fashion enabling the use of a second scart connected unit at times when the receiving unit is not active. The switch is performed automatically by the receiving unit.

30 - A teletext/VBI decoder chip 23 (Philips SAA5284 in this embodiment) for VBI input which performs an extraction of the VBI transport packets from the input video signal and delivers the VBI data to the micro controller for further processing. The Philips SAA5284 is chosen at design time for its general availability and low cost.

35 - A small CPU micro controller 21 (Motorola MC68HC908GP32 in this embodiment) containing RAM and flash memory. The micro controller is responsible for uploading the FPGA image from the EEPROM to the FPGA and for executing the receiving unit application.
• An EE2PROM 22 for storage of FPGA image, in this case an AT24C256 integrated circuit. The EEPROM is loaded at manufacturing time with the FPGA image, even if the design of the receiving unit does allow for field upgrading of the EEPROM contents.

• An FPGA 24 to generate a screen image, e.g. a teletext display page and to provide the output video signal (CVBS output). The FPGA used in the design is a Xilinx XC2S15.

• An external power supply 28 with a connection to the receiving unit. The power supply used depends on the chipsets deployed in the design and this embodiment uses a 9 volt alternating current power supply.

• The receiving unit also comprises an ISP connector 27 and an analog front end 25.

Receiver operation

The receiver is operated by the client tuning the TV set into the channel providing the Receiving unit service. The receiver locates the service by several instances of the broadcast, unencrypted CMD_SERVICE_DETECT command.

When a session is initiated, the receiver signals to the television set to pull its input source to the euroscart socket where the receiver is connected.

When a session is terminated, a command (CMD_BYE) is sent from the transmitting unit to the receiver, to signal to the TV set to switch back to the input source in effect previous to session initiation. This is also automatically done – by the receiver code - after a programmable time of session inactivity.

Receiving unit software

The embedded receiving unit software runs directly from micro controller flash. It has a limited amount of RAM. The teletext page display buffer is resident in a dedicated FPGA RAM area. A register interface to the FPGA supports access to the buffer(s). All protocol layers processing, including FEC, CRC and decryption, is performed in software without hardware support.

The software process the sections along the lines of the following piece of incomplete pseudo code:
char* packet;
const PacketSize = 40;

// Looking for start of section:
5  if ( !ham_decode( packet[ 0 ] ) )
      return Fail( "hamming failed" );

10 if ( !payload_unit_start_indicator )
      return Fail( "not start of new section" );

15 if ( !ham_decode( destination_address ) )
      return Fail( "hamming failed" );

20 if ( !reed_solomon( packet ) )
      return Fail( "RS failed" );

25 crc32 = "crc32 of unencrypted section header";

30 save continuity_counter;
save payload_scrambling_bit;
save section_length; // Modified by process_section_payload()

30 // Do decryption, TLV processing and crc32 …
return process_section_payload( start = packet + 12,
max_length = PacketSize - 12 - 4 );

35 // Succeeding section packets:

35 if ( !ham_decode( packet[ 0 ] ) )
      return Fail( "hamming failed" );

40 if ( payload_unit_start_indicator or wrong continuity_counter )
      return Fail( "packet out of sequence" );
ham_encode( packet[ 0 ] );

if ( !reed_solomon( packet ) )
    return Fail( "RS failed" );

// Do decryption, TLV processing and crc32 ...
return process_section_payload( start = packet + 1,
    max_length = PacketSize
    - 1 - 4 );

In Fig. 3, the image is a regular teletext image comprising 25 lines of up to 40 characters of length. This image can be described in the format of the first signal or in the format of the second signal. By converting the image into the second signal, the image may be broadcast via teletext broadcasting with a relatively low bandwidth usage.

In the following description, the first and second formats corresponding to the image of Fig. 3 will be described further.

HTML is a widely known standard for defining Internet pages etc. The TeleVision Markup Language (TVML) specified in this document is heavily inspired by HTML. One of the weaknesses of HTML is the ad-hoc specification, which makes interpretation of HTML harder than it should be. TVML does not allow the "looseness" that HTML allows, since TVML is encoded as XML documents, e.g. XML doesn't allow a <p> tag without a closing </p> tag as HTML allows. Hence a major difference from HTML is that TVML has a strict grammar, which then has the benefit that TVML parsing and interpretation is simplified.

Before TVML is specified in detail let us look at an example teletext page corresponding to the image of Fig.3

The TVML page that generates the depicted teletext page is:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<tvml>
  <head>
    <title>SmartScart main page</title>
  </head>
  <body bgcolor="black" color="white" link="green">
    <table height="23" width="40">
      <tr>
        <td height="4"><img src="https://smarts-cart.tv/DR-logo.ttf"/></td>
```
The TVML page is quite similar to HTML. Some variations exist in tag attributes and the interpretation of line breaks. Such issues will be clarified in the following.

The first signal is provided from a content provider, in this example a personal menu is provided by a service operator of the system. This signal is received in the format of a TVML document. If this signal was broadcast traditionally, the broadcast signal would comprise all characters of each line of the screen image from the top of the image to the bottom of the image. In total, the transmission of the image of Fig. 3 would require 25*40 bytes, i.e. 1000 bytes to be broadcast.

In the transmission unit according to the present invention, the image would be transformed into commands, examples of which could be:

```
CMD_DISPLAY_STRING (4,0,"E-mail")
CMD_DISPLAY_STRING (5,0,"Kommune information")
```
The two commands display the text strings "E-mail" and "Kommune information" on the fourth and fifth lines of the screen image, respectively.

In total, the screen image of Fig. 3 would require only 610 bytes to be described with commands.

The most relevant commands are: command to display strings, command to colour text, command to colour background, command to clear screen area, command to set font type, command to set font size.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD_DISPLAY_STRING</td>
<td>1</td>
<td>Display a teletext string, maybe spanning several rows.</td>
</tr>
<tr>
<td>CMD_CLEAR_STRING</td>
<td>2</td>
<td>Clear area, maybe a full page</td>
</tr>
<tr>
<td>CMD_KEY_UPDATE</td>
<td>11</td>
<td>Update decryption key</td>
</tr>
<tr>
<td>CMD_BYE</td>
<td>12</td>
<td>Leave “SmartScart Receiver” service</td>
</tr>
<tr>
<td>CMD_SERVICE_DETECT</td>
<td>13</td>
<td>For service detection</td>
</tr>
<tr>
<td>CMD_DEBUG</td>
<td>14</td>
<td>Print debug info</td>
</tr>
</tbody>
</table>
command_value() {
    if (command_type == CMD_DISPLAY_STRING) {
        display_row 8 uimsbf
        display_column 8 uimsbf
        for (i=0; i<N; ++i) {
            display_teletext_char 8 uimsbf
        }
    }
    if (command_type == CMD_CLEAR_STRING) {
        clear_row 8 uimsbf
        clear_column 8 uimsbf
        clear_length_continuation 1 bslbf
        clear_length_most_significant 7 uimsbf
        if (clear_length_continuation == '1') {
            '0'
            clear_length_least_significant 7 uimsbf
        }
    }
    if (command_type == CMD_KEY_UPDATE) {
        for (i=0; i<N; ++i) {
            key_byte 8 uimsbf
        }
    }
    if (command_type == CMD_BYE) {
    }
    if (command_type == CMD_SERVICE_DETECT) {
        service_detect_magic 32 bslbf
        service_detect_reserved 32 bslbf
    }
    if (command_type == CMD_DEBUG) {
        debug_arguments 32 bslbf
    }
}
CLAIMS

1. A method for transmitting a television screen image to a dedicated entity, said method comprising the steps of:
   5
   - transforming a first signal representing data defining the screen image into a second signal representing a combination between data and commands which commands control formatting of the data so as to define the same screen image,
   - broadcasting the second signal, and
   10 - receiving the broadcast signal by a number of entities, and where the second signal is transformed into a screen image which is visible on a TV-device.

2. A method according to claim 1, wherein, the second signal further comprises an identifier of the entity to which the signal is dedicated, and wherein the identifier is compared with a reference identifier by the receiving entities and the transformation of the second signal into a screen image is conditioned on the comparison.

3. A method according to claim 1 or 2, wherein the broadcasting of the second signal is conditioned on receiving a request for broadcasting the screen image.

4. A method according to claim 3, wherein the request is transmitted from the receiver to the broadcaster via a telephone connection.

5. A method according to claim 4, wherein the screen image is only visible while the telephone connection is sustained.

6. A method according to claim 3, wherein the request is transmitted from the receiver to the broadcaster via an e-mail or an SMS.

7. A method according to claims 3-6, wherein the broadcasting of the second signal is further conditioned on the identification of the entity towards the broadcaster.

8. A method according to any of the preceding claims, wherein the screen image comprises a teletext page which conforms to an international teletext standard.

9. A method according to any of the preceding claims, wherein the signal is broadcast via a cable.

10. A method according to any of claims 1-8, wherein the signal is broadcast wirelessly.
11. A method according to any of the preceding claims, wherein the second signal is broadcast as an extension packet which conforms to the European Telecommunication Standard document number ETS 300 706 may 1997.

12. A method according to claim 11, wherein the first signal is converted into a signal with reduced information content in an unambiguous format.

13. A method according to any of the preceding claims, wherein, at the receiver's site, the second signal is converted into standard broadcasting format of a teletext-page.

14. A method according to any of the preceding claims, wherein the second signal is encrypted.

15. A system for transmitting a television screen image to a dedicated entity, said system comprising:

- a first transmitting unit having
  - transforming means for transforming a first signal representing data defining the screen image into a second signal representing a combination between data and commands which commands controls formatting of the data so as to define the same screen image, the second signal further representing an identifier of the entity,
  - broadcasting means for broadcasting the second signal, and

- a second receiving unit having
  - receiving means for receiving the broadcast signal, and
  - processing means for comparing the identifier with a reference identifier, and based upon the comparison, for transforming the second signal into the screen image.

16. A system according to claim 15, wherein the first unit is provided with request receiving means for receiving a request for broadcasting the screen image, and wherein the transmission of the second signal is conditioned on receiving a request.

17. A system according to claims 15-16, wherein the first unit is provided with identification verification means for verification of an identification insignia provided to the first unit via the second unit.

18. A system according to any of the preceding claims, wherein the first unit is connected to the second unit via a cable.
19. A system according to any of claims 15-17, wherein the first unit is adapted to transmit the second signal wirelessly to the second unit.

20. A system according to any of claims 15-19, wherein the first unit is adapted with a converter for converting a screen image into a "TVML"-signal, and for converting the TVML signal into an extension packet conforming to the European Telecommunication Standard (ETS).

21. A system according to any of claims 15-20, wherein the second unit is adapted with a converter for converting an extension packet is converted into standard broadcasting format of a teletext-page.

22. A system according to any of claims 15-21, wherein the first unit comprises encryption means for encrypting the second signal prior to the broadcasting of the signal and wherein the second unit comprises decryption means for decrypting the received signal.

23. A receiver for connection to a TV-signal input channel of a TV-device, the receiver being adapted to receive and process a broadcast signal comprising information which comprises commands in the form of instructions for the receiver in order to generate a screen image to be transmitted to the input channel of the TV-device.

24. A receiver according to claim 23, being adapted to compare an address identifier comprised in the received broadcast signal with a reference identifier stored in a memory module of the receiver and upon recognition of the identifier, to process the corresponding commands comprised in the signal.

25. A receiver according to claims 23, 24, wherein the reference identifier is a unique identifier of the receiver.

26. A receiver according to claims 23-25, wherein the receiver is adapted to receive a teletext-signal which conforms to the international teletext standards.

27. A receiver according to claims 23-26, wherein the receiver is adapted to process a signal which is comprised in the extension packets of the teletext-signal.

28. A receiver according to claim 23-27, wherein the receiver is adapted to be further connected to a TV-signal output channel of a TV-device and to receive the broadcast signal in a pre-processed form from the TV-device.
29. A receiver according to claims 23-28, wherein the received signal is a video-signal.

30. A receiver according to claim 23-29, wherein the signal which is transmitted to the input channel of the TV-device is based on the received video-signal with an inserted teletext page.

31. A receiver according to claim 23-29, wherein the signal which is transmitted to the input channel of the TV-device is a black-level video-signal.

32. A receiver according to claims 23-30, wherein the receiver is connected to the TV-signal input and/or output channel via a euroscart connector or phono plugs.

33. A data signal conformed to the European telecommunication standard for non-displayable packets, said data signal comprising commands arranged within the last 39 bytes of the packet.

34. A data signal according to claim 30, wherein the commands are selected from the group consisting of commands to: display strings, clear strings, colour text, colour background, clear screen area, end session, detect a present service, instruct a receiver to transmit to a TV-device system relevant information, set font type and to set font size.
Fig. 1
Fig. 2
Fig. 3
### INTERNATIONAL SEARCH REPORT

**A. CLASSIFICATION OF SUBJECT MATTER**

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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)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

**Electronic data base consulted during the international search (name of data base and, where practical, search terms used)**

EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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<td>WO 00 01142 A (WEBTV NETWORKS INC) 6 January 2000 (2000-01-06) page 8, line 15 -page 9, line 7 abstract; figure 6 ---</td>
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**Further documents are listed in the continuation of box C.**

**Patent family members are listed in annex.**

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**Date of the actual completion of the international search**

3 February 2003

**Date of mailing of the International search report**

18. 02. 2003

**Name and mailing address of the ISA**

European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel: (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016

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JESPER BERGSTRAND/ JA A

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