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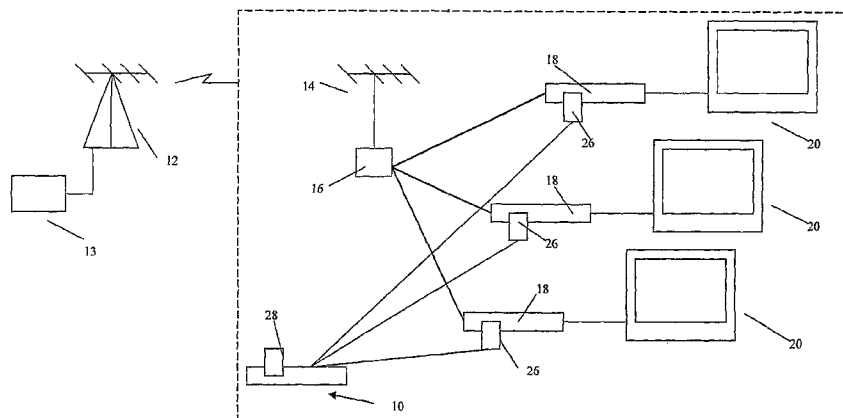
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(54) Title: A CONDITIONAL ACCESS DEVICE



(57) Abstract: A conditional access device including one or more smart card interface devices and a central controller. The smart card interface devices are each in communication with a smart card reader of an associated decoder receiving an incoming transmission including entitlement messages. The central controller is in communication with each smart card interface device and has a smart card reader for receiving a smart card that stores information relating to the entitlements of a user of a conditional access system. The central controller receives data including the entitlement messages from each of the smart card interface devices, synchronises said data and provides said data to the smart card via the smart card reader and transmits return signals generated in response to said data from the smart card to each of the decoders via the smart card interface devices.

WO 2007/037672 A1

- 1 -

“A CONDITIONAL ACCESS DEVICE”**BRIEF DESCRIPTION OF THE INVENTION**

The present invention relates to a conditional access device for use in systems in which access
5 to transmitted data is controlled.

FIELD OF THE INVENTION

The present invention relates to a device that can be utilised at the user end of a conditional
access system. The device may be utilised in any system in which access to transmitted data is
10 controlled. One example of such a system is a conditional access television system.

In general, conditional access television is implemented at the user's end by installation of a
decoder that is used to receive encrypted television content and to decrypt this content for
display. In order to ensure that the encrypted content is available for access only by authorised
users, the decryption is facilitated by a smart card provided to the authorised user. The smart
15 card is provided with information that allows the decoder to decrypt entitlement management
messages (EMMs) sent by the central management device to each authorised decoder. The
decrypted entitlement management messages provide keys that the decoder may then use to
decrypt entitlement control messages (ECMs), thereby providing the control words used to
decrypt the encrypted content for display.

20 The standard arrangement of a decoder using an authorised smart card allows only for the
decryption and display of one television channel for display on one television. Therefore, if an
authorised user would like to view more than one channel at a time, for example if the user
has more than one television in their residence, then they will be required to obtain an
additional decoder and associated smart card.

25 The present invention attempts to overcome, at least in part, the aforementioned problem.

SUMMARY OF THE INVENTION

In accordance with one aspect of the present invention there is provided a conditional access device comprising:

5 one or more smart card interface devices each in communication with a smart card reader of an associated decoder, each decoder receiving an incoming transmission including entitlement messages;

a central controller in communication with the or each smart card interface device and having a central smart card reader for receiving a central smart card that stores information relating to
10 the entitlements of a user of a conditional access system;

wherein the central controller receives data including the entitlement messages from each of the smart card interface devices, synchronises said data and provides said data to the central smart card via the central smart card reader and transmits return signals generated by the central smart card in response to said data to each of the decoders via the smart card interface
15 devices.

DESCRIPTION OF THE DRAWINGS

The present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a diagrammatic view of a conditional access system incorporating the device of the
20 present invention;

Figure 2 is a block diagram of the functional elements of a conditional access device in accordance with the present invention;

Figure 3 is a block diagram of a conditional access device in accordance with the present invention; and

Figure 4 is a logic diagram showing the initialisation process of the central controller of the conditional access device 10.

DESCRIPTION OF THE INVENTION

5 Referring to the Figures, there is shown a conditional access device 10 for use in a system that controls access to transmitted data. It will be appreciated that the device 10 may be utilised in a system transmitting any type of data to which access is controlled. For example, the device may be used in systems transmitting television signals, radio signals, games or any other signals or combinations of such signals. The embodiment described, however, will be in
10 relation to a PayTV system.

The system comprises known components of a conditional access television system including a transmitter 12 for transmitting television content from a transmission centre 13. The transmitted content includes encrypted content along with entitlement messages, being entitlement management messages (EMMs) and entitlement control messages (ECMs), in a
15 known manner. The system also includes a receiving antenna 14 connected to a distributor 16 for distributing the received signals to one or more decoders 18. Each of the decoders 18 is of a known type utilising a smart card, inserted into a smart card reader in the decoder 18, to process the entitlement messages and allow the decoder to decrypt the content for viewing on an associated television 20. In the embodiment shown in Figure 1, three decoders 18 are
20 provided with associated televisions 20.

The conditional access television device 10 is arranged to communicate with each of the decoders 18 in a way that allows each decoder 18 to decrypt the content received for display without the use of a dedicated smart card in each decoder 18. The conditional access television device 10 thereby allows the users to view different channels of the received
25 content at the same time without the need to obtain multiple smart cards.

- 4 -

Functional elements of a conditional access television device 10 in accordance with the present invention are shown in Figure 2. A block diagram of a conditional access television device 10 in accordance with the present invention is shown in Figure 3. The conditional access television device 10 comprises a central controller 22, a smart card reader 24 and one
5 or more smart card interface devices 26.

The central smart card reader 24 comprises a standard reader device for receiving a central smart card 25 that allows authorisation of encrypted television content transmitted from the transmission centre 13. The central smart card 25 contains information to enable the processing of entitlement messages and thereby allow decryption of the transmitted content.

10 The central smart card reader 24 is in communication with the central controller 22. The function of the central controller 22 is to relay messages between the central smart card 25 and each of the decoders 18. The central controller 24 is therefore provided with one or more I/O interface modules 27, wherein each interface module 27 is connectable to an associated smart card interface device 26. The I/O interface modules 27 are preferably each provided
15 with a connection 28 in the form of an RJ45 connector.

The central controller 22 may be directly connected to the I/O interface modules 24, or there may be provided a separate I/O Bus sync module 38, as shown in Figure 2. The I/O bus sync module 38 may provide additional management of the bus signalling and may provide for easier manufacturing and maintenance.

20 Each smart card interface device 26 comprises a card to be inserted into the reader of one the decoders 18. The smart card interface device 26 includes no processor or memory but contains contacts 30 for engaging with the decoder 18 and a connection 32 in the form of an RJ45 connector, as shown in Figure 2. The smart card interface device 26 is thereby connected to the associated I/O interface module 27 by an appropriate connecting cable.

- 5 -

Alternatively, the connection to the smart card interface devices 26 may be via suitable wireless means.

The conditional access television device 10 is also provided with an audio/video input controller 40 and multiplexer/demultiplexer unit 42 to receive the transmitted data and supply
5 it to the central controller 22 in a known fashion. Further, the conditional access television device 10 may be provided with a user input means 44, for example in the form of a keyboard and display panel to allow appropriate user control of the conditional access television device 10.

In use, each of the smart card interface devices 26 is inserted in an associated decoder 18. The
10 signals from the decoder 18 that would usually be intended for a smart card inserted in the reader of the decoder 18 are detected by the contacts 30 and passed via the connecting cable and I/O interface module 27 to the central controller 22. The central controller 22 checks the decoder smart card communication protocols and synchronises those signals with the interface to the central smart card 28 in the central smart card reader 25 such that data and requests to
15 the readers in each of the decoders are routed to the smart card 28 and appropriate return signals provided back to each decoder 18. As shown in Figure 3, each of the central controller 22 and the I/O interface modules 27 contain appropriate synchronisation means and buffering to enable correct synchronised operation.

As shown in Figure 3, during initialisation the central controller 22 checks that the central
20 smart card 25 is inserted into the central smart card reader 24. If so, the central controller 22 further checks that the smart card interface devices 26 are inserted into the associated decoders 18 and if so, waits for an appropriate reset command from each of the decoders 18 before enabling the central controller 22 in a read and update mode, in which data is provided between the smart card 28 and each of the decoders 18 in a synchronised manner.

- 6 -

While the invention as described above allows the end user to view multiple channels without the need to have additional smart cards, it also presents benefits for the service providers. For example, the service provider would be able to increase the number of viewers without the necessity of producing and monitoring additional smart cards or changing any of the existing
5 infrastructure. The device may also be used for obtaining more accurate information on viewership data by tracking on the slave cards. It may be possible for example to track which channels were watched by which members of a household utilising independent slave cards for those viewers.

At present, some operators provide discounted rates to users who require an additional
10 decoder to access further channels simultaneously. This method results in potential for users purchasing additional decoders and authorised smart cards at discount rates and reselling. The present invention may provide a better alternative by introducing a distance limitation to the system such that only televisions within a predefined distance from the central controller are operable. This would prevent users reselling services to neighbours. It may also be desirable
15 to limit the quantity of decoders with slave cards that can be linked to the device. Further, for further control, it may be desirable to issue special smart cards which denote that they are used with the multiple decoder set up provided by the present invention.

The physical construction of the conditional access television device 10 may be in any form to provide sufficient functionality to perform the tasks as described above. Preferably, the
20 central smart card reader 24, the central controller 22 and I/O interface modules 27 will be constructed on a single printed circuit board having the required microprocessors and circuitry. The conditional access television device 10 may then be operated by insertion of the central smart card 25 into the central smart card reader 24 and connection of the smart card interface devices 26 to the decoders 18 by the connecting cables. It will be appreciated
25 however that other physical constructions may be possible. For example, the arrangement

- 7 -

may be implemented on a personal computer with suitable peripheral hardware and appropriate software.

Modifications and variations as would be apparent to a skilled addressee are deemed to be within the scope of the present invention.

CLAIMS

1. A conditional access device comprising:
one or more smart card interface devices each in communication with a smart card reader of
5 an associated decoder, each decoder receiving an incoming transmission including entitlement
messages;
a central controller in communication with the or each smart card interface device and having
a smart card reader for receiving a smart card that stores information relating to the
entitlements of a user of a conditional access system;
10 wherein the central controller receives data including the entitlement messages from each of
the smart card interface devices, synchronises said data and provides said data to the smart
card via the smart card reader and transmits return signals generated by the smart card in
response to said data to each of the decoders via the smart card interface devices.
- 15 2. A conditional access device in accordance with claim 1, wherein the central controller
includes one or more I/O interface modules, each I/O interface module being connected with
an associated one of said smart card interface devices.
3. A conditional access device in accordance with claim 2, wherein a I/O bus sync
20 module is provided for management of bus signalling between the central controller and the
or each I/O interface modules.
4. A conditional access device in accordance with any one of claims 1 to 3, wherein the
or each smart card interface device comprises a card to be received in a reader of the decoder,

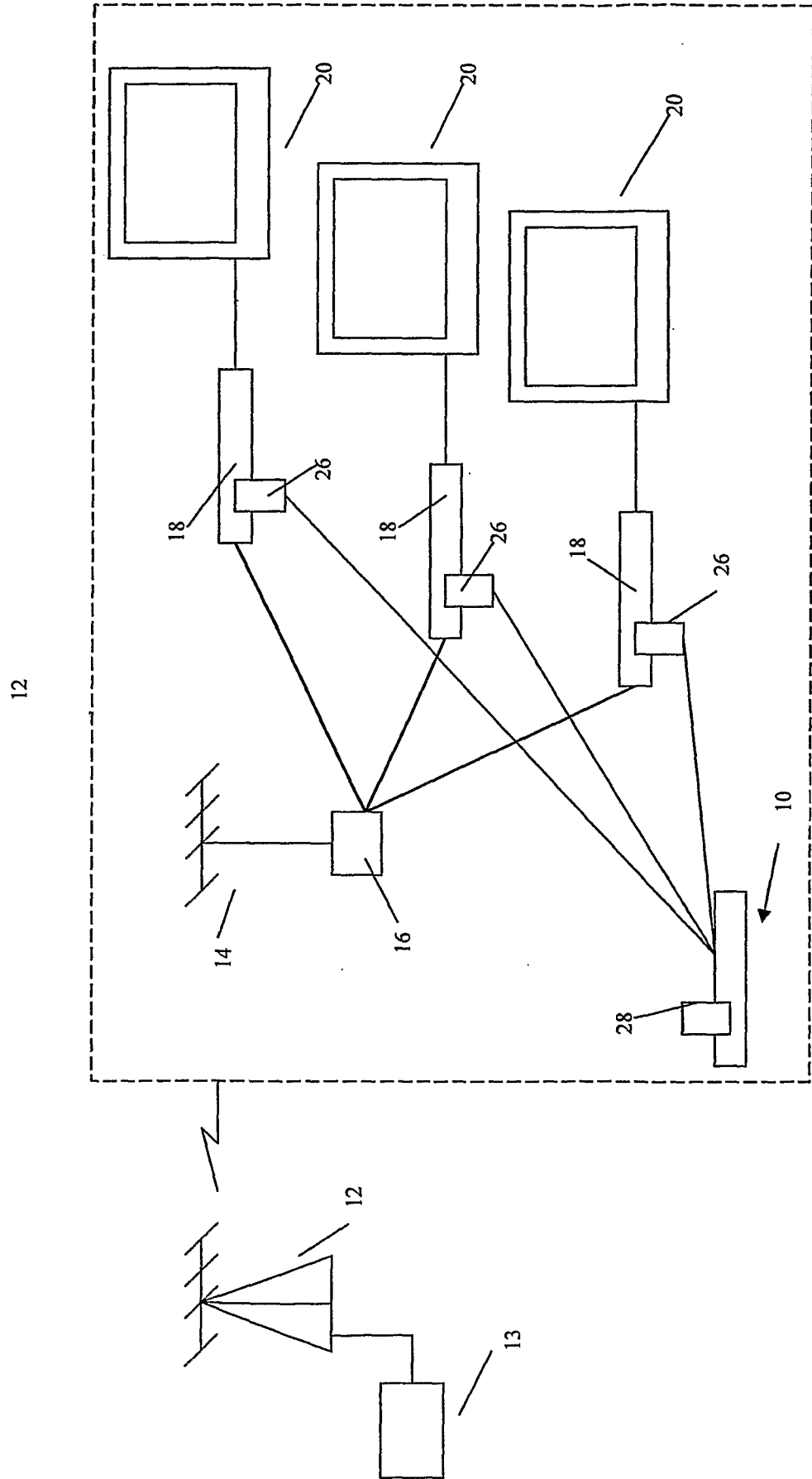
the card having contacts and a connection means for connecting with the associated I/O interface module.

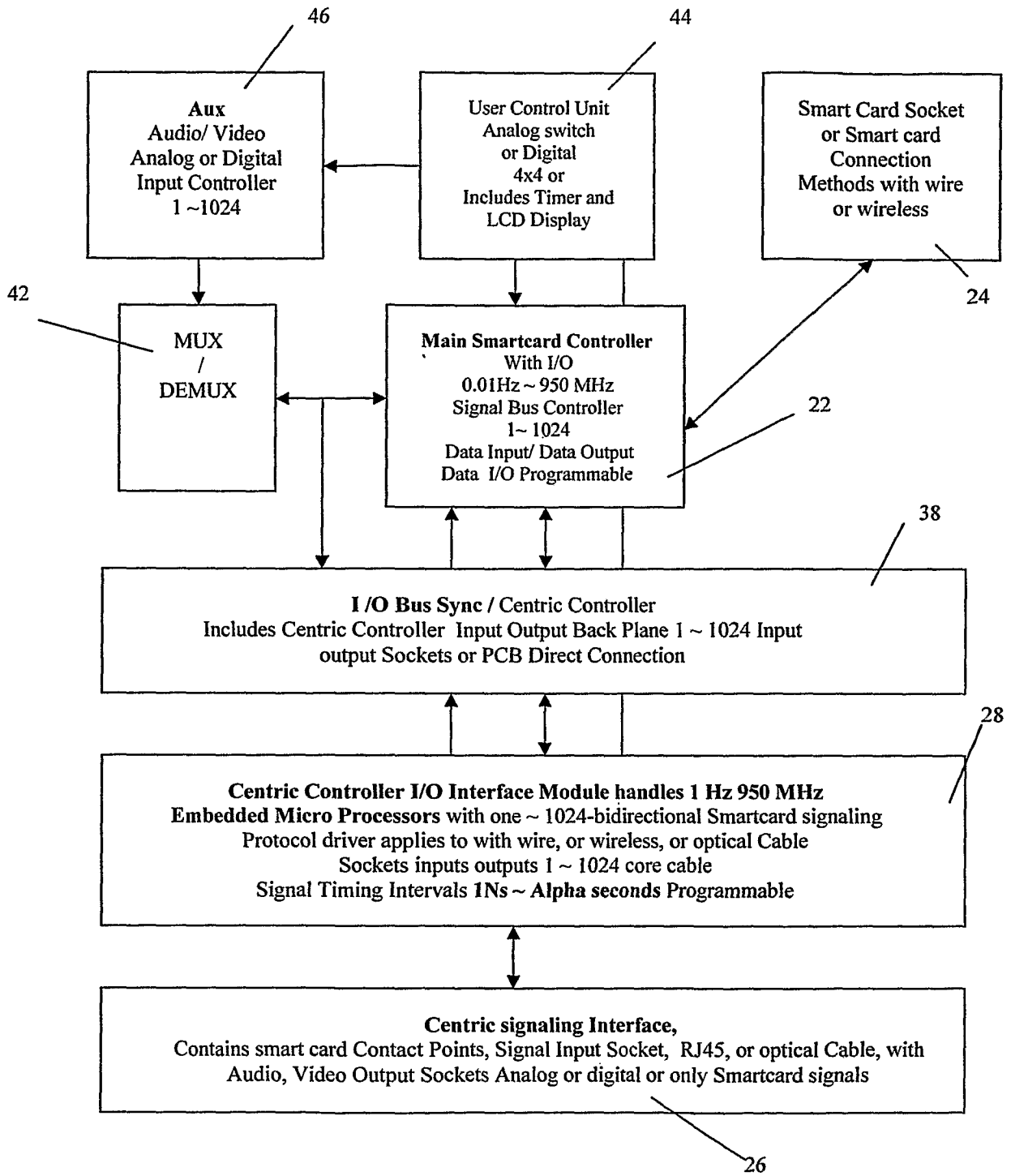
5. A conditional access device in accordance with claim 4, wherein the connection means
5 comprises an RJ45 connector.
6. A conditional access device in accordance with claim 4, wherein the connection means
comprises a wireless transmission means.
- 10 7. A conditional access television device in accordance with any one of the preceding
claims, wherein the central controller includes an AUX input for receiving said transmission.
8. A conditional access device in accordance with any one of the preceding claims,
wherein the central controller includes a user input means for controlling operation of the
15 conditional access device.
9. A conditional access device in accordance with claim 8, wherein the user input means
comprises a keyboard and display means.
- 20 10. A conditional access device in accordance with any one of the claims 2 to 9 wherein
the central controller, smart card reader and I/O interface modules are constructed on a single
printed circuit board.
11. A conditional access device in accordance with any one of the preceding claims,
25 wherein said incoming transmission comprises television data.

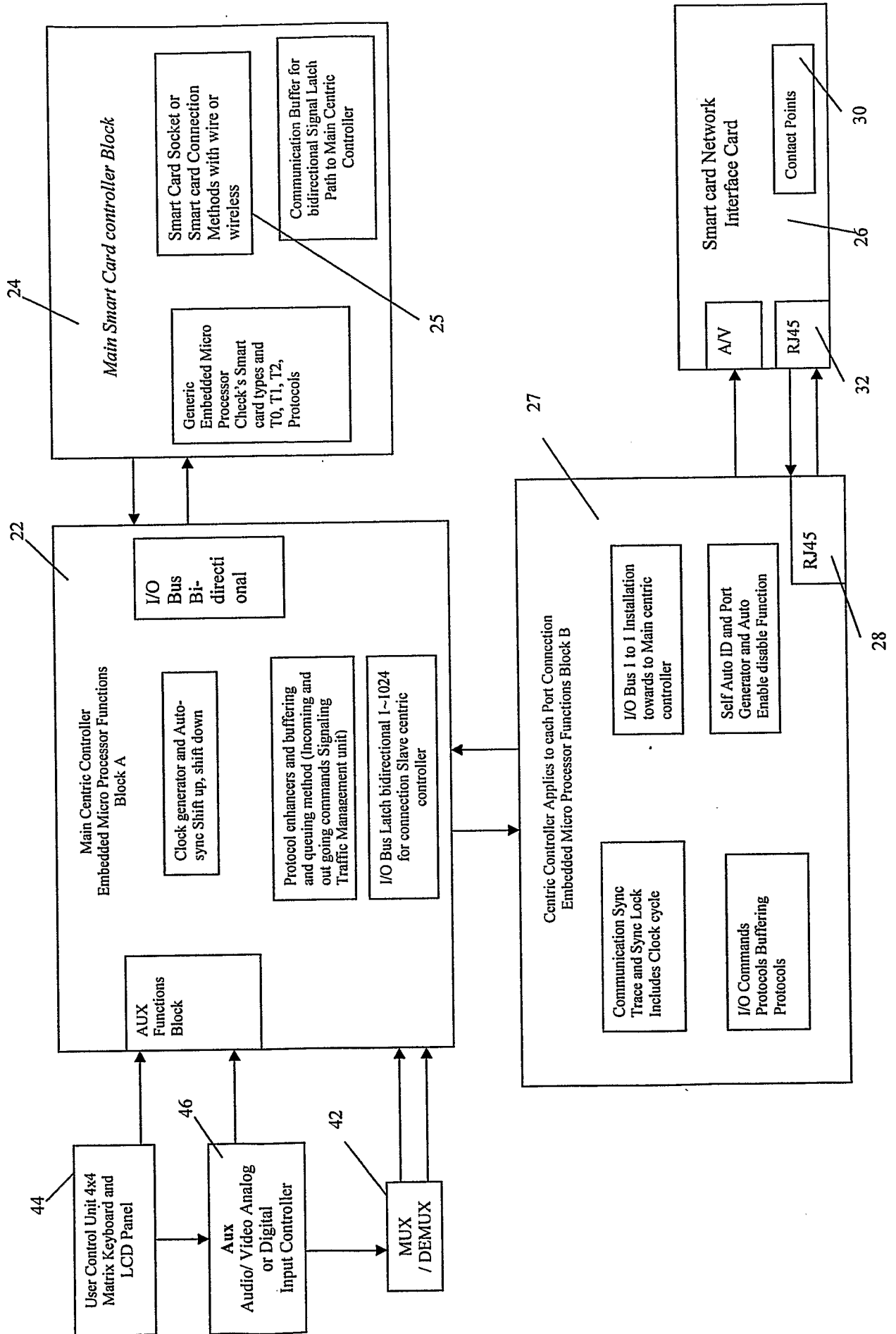
12. A conditional access device in accordance with any one of the preceding claims, wherein the central controller includes a means to limit the distance between the central controller and the or each smart card interface device to a predefined maximum distance.

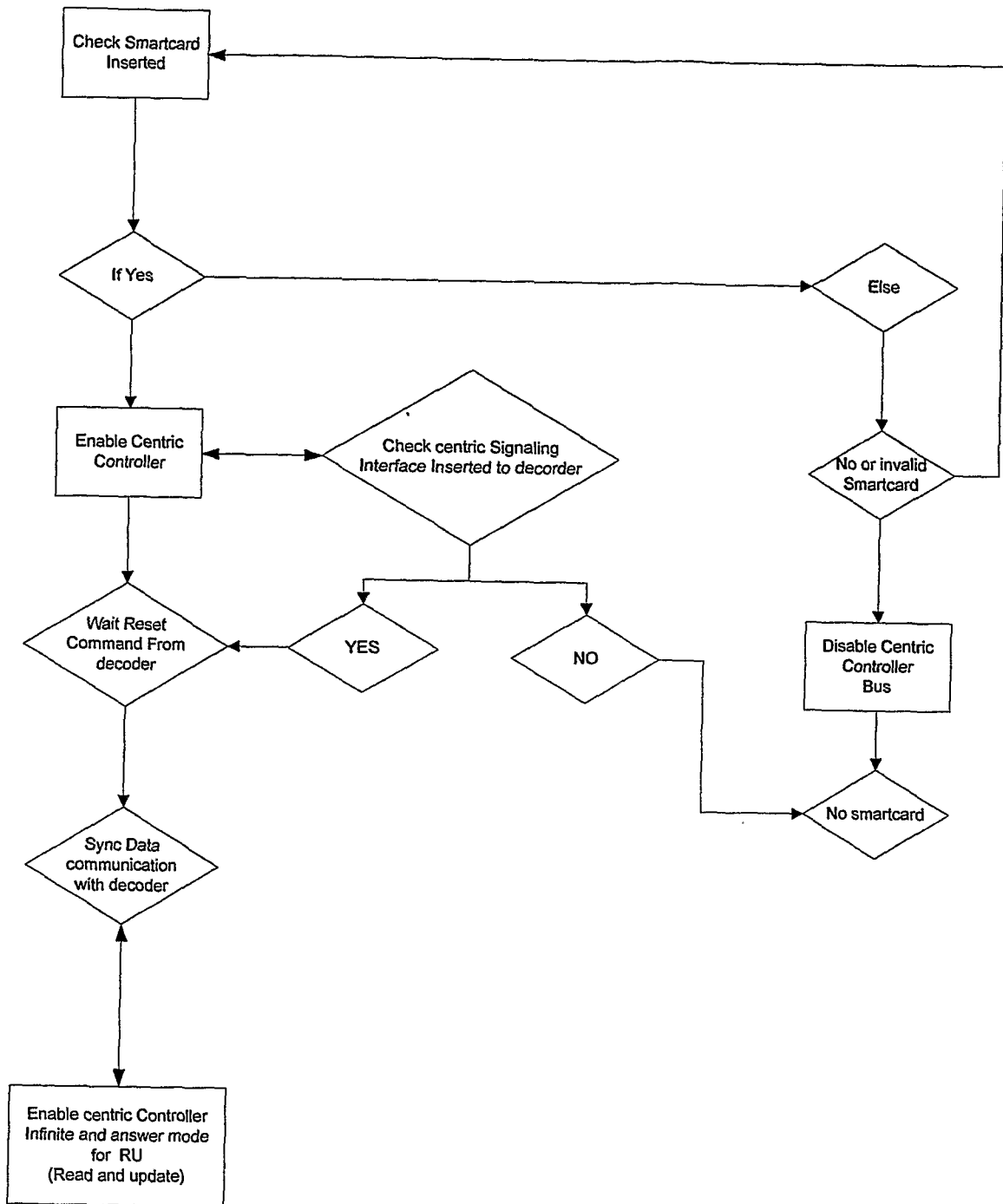
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13. A conditional access device substantially as hereinbefore described with reference to the accompanying drawings.









INTERNATIONAL SEARCH REPORT

International application No.

PCT/MY2006/000014

A. CLASSIFICATION OF SUBJECT MATTER Int. Cl. H04N 7/173 (2006.01) 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) 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 practicable, search terms used) dwpi (smart card reader, interface, decoder, receiver, access, central, control)					
C. DOCUMENTS CONSIDERED TO BE RELEVANT					
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.			
A	US 6424947 B1 (TSURIA et al.) 23 July 2002 The whole document				
A	GB 2334361 A (NDS LIMITED) 18 August 1999 The whole document				
<input type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex					
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/MY2006/000014

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Patent Document Cited in Search Report	Patent Family Member			
US 6424947	GB 2329736	GB 2334125	GB 2334361	
	IL 121862			

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX