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(54) Title: METHOD AND APPARATUS FOR PROVIDING CELL IDENTITY INFORMATION AT HANDOVER

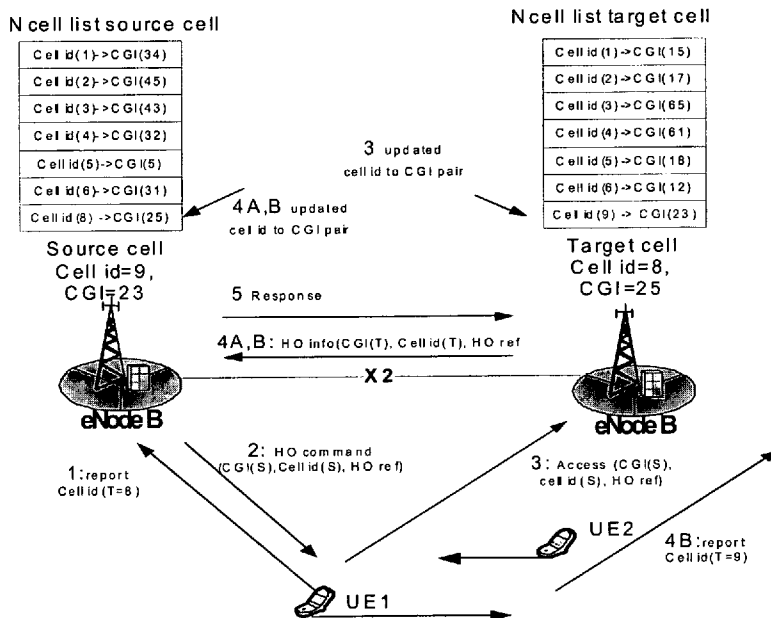


Figure 3

(57) Abstract: A handover is enabled to be performed, based on a determination by a mobile terminal, based solely on a cell-id reported by the mobile terminal. If cell-id to CGI translation is missing in the stored Ncell list in the source cell, the handover is not aborted. Instead the source cell sends a specific handover command that causes the mobile terminal to access the cell associated with the cell-id that was indicated in the measurement report, allowing a handover to proceed.

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METHOD AND APPARATUS FOR PROVIDING CELL IDENTITY INFORMATION AT HANDOVER

The present invention relates to wireless telecommunications networks.

5 BACKGROUND OF THE INVENTION

Figure 1 of the accompanying drawings illustrates a wireless telecommunications network, which defines a number of communication cells (A, B, C, D) each of which is served by a radio base station 2. Each communication cell covers a geographical area, and by
10 combining a number of cells a wide area can be covered. A mobile terminal 4 is illustrated communicating in cell A, and is able to move around the system 1.

A base station 2 contains a number of receivers and transmitters to give radio coverage for one or more cells. Each base station 2 is connected to network "backbone", or core
15 network infrastructure (not shown), which enables communications between base stations and other networks. The example system of Figure 1 shows one base station per cell.

An important concept in such a network is the cell and its neighbours. During a call a mobile terminal 4 typically moves around among the cells; moving from one cell to one of
20 its neighbours, repeatedly. A list of the known neighbours, the so-called "neighbour cell set", is important for the network 1 to enable reliable handover between cells of a mobile terminal 4. The network 1 can store information relating to a neighbour set typically for each cell, the information can further be modified to be suitable for each mobile terminal e.g. adapt to mobile terminal measurement capabilities. The neighbour set is used for
25 evaluation and handover of a mobile terminal from one cell to another as the mobile terminal crosses a cell boundary. It will be readily appreciated that the cell boundaries are not sharply defined, but will in practice be somewhat blurred as the range of the base stations will overlap with one another.

30 In existing systems, the mobile terminal 4 detects cell operating parameters for neighbouring cells. The measured operating parameters are typically scramble code (an encoding code which is non-uniquely assigned to the cell), signal strength, signal quality and timing information. The mobile terminal measures the operating parameters of each neighbour cell (Ncell) and reports those back to the network 1. When the quality of a

neighbour cell is considered better than the current serving cell, a handover from the serving cell to the chosen neighbour cell is triggered. The neighbour cell then becomes the serving cell for the mobile terminal.

5 It will be apparent that it is necessary in such systems to provide a mechanism for identifying each cell. In fact, each cell can typically be identified in more than one way. For example, each cell has an identity that is at least unique within its own "domain", that is, the part of the system using the same network backbone. This identity may be unique within the mobile network operator's network, and may even be unique amongst all
10 networks worldwide. Such an identity is referred to herein as a unique cell identity. The unique cell identity is also referred to herein as the Cell Global Identity (CGI). An example of a unique identity is to use the network address (for example the IP address) of the network node or nodes (such as the Radio Base Station, Radio Network Controller, eNodeB) that controls the cell Ncell list. The explicit address depends on the addressing
15 scheme and backbone solution for the system.

In addition, a cell can also be identified on the basis of a non-unique cell identity that typically is reused within the network, but may for example nevertheless be useful because it can be retrieved quickly and with small UE effort from the cell in question. For
20 example, in the case of a WCDMA (wideband code division multiple access) system, the scrambling code may be a useful non-unique cell identity. In the case of a GSM system, a combination of the frequency and the base station identity code (BSIC) may be used as a non-unique cell identity. The non-unique cell identity is also referred to herein as the cell-
id.

25 Typically in a WCDMA (wideband code division multiple access) system, the mobile terminal detects synchronisation channel (synchannel) transmissions from surrounding cells, in order to determine id (scramble code) and timing information. Pilot signals can then be detected to determine signal strength and quality measurement. The mobile
30 terminal 4 would then only report cells which have measurements above predetermined threshold levels.

When the mobile reports the neighbour cell signal quality measurements to the network, the cells' respective identities become important. Currently, cell identities (scramble

codes) are reused for more than one cell. The reuse of identities means that cells may be confused with one other, since a measurement order for neighbour cell set and the serving cell may include cells having the same identity information.

- 5 Robustness against faults in the neighbourhood cell (Ncell) list planning, and support for self-configuring or self-adjusted Ncell lists, are important for current and future wireless telecommunications networks.

10 One current solution is based on neighbour cell identity information (cell-id) and after non-real time post processing of the measurements, the Ncell list is manually adjusted by the operator. One purpose of the Ncell list is to give translation from a cell-id to cell global id. The range of cell-id is limited in order to save radio resources and so cell-ids have to be re-used. However, the CGI (Cell Global Identity) is unique and can be used to determine a "globally" unique network address to the cell.

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In such a cellular system, handover mechanisms are important, whereby a mobile terminal cell ceases communications with a current serving cell, and starts communications with a new, target, cell. Existing solutions do not provide means for the serving cell to be able to order a UE to handover a mobile terminal to a target cell without
20 knowledge in the serving cell of the CGI for the target cell.

Two types of handover are of particular relevance. In a traditional handover, sometimes referred to as backward handover, the network decides that a handover is to take place (possibly assisted by the terminal). This decision is made typically based on DL (downlink)
25 measurements made by the terminal and reported to the network but could also be assisted by, or based on, UL (uplink) measurements. These measurements are typically made on common pilots/signals sent from the serving cell and the neighbouring cells. Measurements on the serving cell can also be made in the established link between the source base station (BS) and the terminal. These measurements include the non-unique
30 cell id of the potential target cells. The network (in an LTE network this function takes place in the eNodeB, for a WCDMA network in the nodeB + RNC, and in a GSM network in the RBS + BSC) looks up the unique cell-id that corresponds to the non-unique ID, and initiates a link set up through the backbone network. Next it orders the terminal to access the target cell, at a specified channel and/or by giving grants to use a shared channel.

In an alternative, referred to as a forward handover, as supported in connection with the WiMAX system and discussed in connection with the 3GPP LTE standard, the terminal decides on the handover based on measures on the source cell and on a target cell. The terminal initiates the access to the target cell, by sending a random access on a common random access channel. Before the terminal may access the target cell, the source radio base station has prepared one or more target base stations with information on a potential access by the terminal, and provided information on an identity of the connection. When the terminal access the target cell, it informs of the identity and the target cell initiates the link through the core network being switched from the former source cell to the target cell. For the identification Ncell list is essential to map the non-unique cell ID with the unique ID. Without a correct Ncell list handover to potential target cells is impossible.

15 **SUMMARY OF THE PRESENT INVENTION**

Embodiments of the present invention enable a handover to be performed, based on a determination by a mobile terminal reported cell-id's. Specifically, information regarding a cell in a cellular communications network is passed to another cell.

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According to a first aspect of the invention, there are provided a base station system, and a method for use therein, for providing such information.

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According to a second aspect of the invention, there are provided a base station system, and a method for use therein, for receiving such information.

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According to a third aspect of the invention, there are provided a mobile terminal, and a method for use therein, for assisting in the transfer of such information.

An advantage of the present invention is that the operator of a network is released from the updating of neighbour cell relations, and in particular making a mapping between non-unique and unique cell identities. Instead, the network in assistance with the terminal has the capacity to update these relations automatically. This is a relief in the operating of a network because new cells are often introduced and the radio relations between cells

modified. Without the correct relations in the neighbour list, handover cannot be performed to the right cells. For cellular systems with frequency re-use 1, radio link connection over best cell is crucial for the overall interference level and system capacity.

5 A further advantage is that it can be detected if cells have been assigned non-unique cell identities in a way that causes conflict. For example in other cell having relations with two neighbours with the same non-unique cell identity.

10 The present invention allows also updating of the cell planning tools database and observations and corrections of NCell list deficiencies in network nodes.

BRIEF DESCRIPTION OF THE DRAWINGS

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Figure 1 illustrates a cellular wireless telecommunications network;

Figure 2 illustrates a mobile terminal and a base station;

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Figure 3 illustrates a technique embodying the present invention;

Figures 4 to 6 illustrate steps in a method embodying one aspect of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

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Figure 2 is a schematic diagram showing a mobile terminal 4 and a base station 2 which communicate via an air interface 6. The base station 2 includes a controller 22, input/output (I/O) interface 24, a radio transceiver 26 and an antenna 28. The controller communicates with mobile terminals via the transceiver 26 and antenna 28 over the air interface 6. The controller 22 also communicates with the rest of the telecommunications network via the I/O interface 24. The base station 2 shown in Figure 2 has the functions of a radio base station, such as a Base Transceiver Station (BTS) in a GSM system or a NodeB in a WCDMA system. Depending on the system architecture, the base station

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systems of the present may be radio base stations, or may comprise radio base stations in combination with one or more additional network nodes.

5 The mobile terminal 4 comprises a controller 42, a man machine interface (MMI) 44, a radio transceiver 46, and an antenna 48. The controller of the mobile terminal 4 serves to control communications with the base station 2 via the transceiver 46 and antenna 48, over the air interface 6. Interactions with the user of the device take place using the man machine interface 44, which can include a key pad, microphone, loudspeaker and display device, for example. These aspects of the base station and mobile terminal are designed
10 to operate in accordance with usual practice.

However, base stations 2 and mobile terminals 4 which operate in accordance with the present invention are adapted to carry out the method of the invention as described below with reference to Figures 3 to 6. It will be appreciated that the various functional units can
15 be provided by the controller, or by other specific units in the devices, or network 1. The invention is described in part with reference to methods performed in the base stations, which may be referred to as radio base stations or radio base station systems (it being appreciated that the relevant functionality may be contained in separate nodes of the network), but which may be indicated by different terminology in different
20 telecommunications standards.

While the mobile terminal has a radio communication link with one of the base stations, it makes measurements on transmissions from other base stations, and reports the results cell-id's periodically or only when handover event criteria are fulfilled.
25

In a normal case, the source cell RBS will be able to translate the received cell-id to a CGI and a valid network address in order to contact the target cell and ask for resources to be made available to the mobile terminal after the handover.

30 However, if the source cell has no translation to a CGI for a mobile terminal detected cell-id, the source cell is able to order the mobile terminal to do a specific "cell-id handover" to the cell having the cell-id just received from the mobile terminal. The mobile terminal will then access the target cell and indicate that it was a "cell-id handover" and provide the source cell CGI and cell-id and, optionally, a handover reference number to the target cell.
35

As discussed above, the cell-id is a non-unique cell identity that may be reused within the network, but may for example nevertheless be useful because it can be retrieved easily from the cell in question. For example, in the case of a WCDMA (wideband code division multiple access) system, the scrambling code may be a useful non-unique cell identity. In the case of a GSM system, a combination of the frequency and the base station identity code (BSIC) may be used as a non-unique cell identity.

The Cell Global Identity (CGI) by contrast is a unique cell identity, that is, an identity that is unique within its own "domain", that is, the part of the system using the same network backbone. This identity may be unique within the mobile network operator's network, and may even be unique amongst all networks worldwide. For example, the CGI could be the IP address of the base station.

A method embodying the present invention can be expressed as follows, with reference to the schematic illustration of Figure 3 and the flow chart of Figures 4, 5 and 6.

Figures 3-6 refer to a particular embodiment of the invention, in an LTE network, in which the radio base station systems take the form of eNodeBs 60, 70, although it will be appreciated that the invention is equally applicable to a WCDMA network in which the radio base station system takes the form of the nodeB + RNC, and in a GSM network in which the radio base station system takes the form of the RBS + BSC. Also, the mobile terminal takes the form of user equipments UE1, UE2.

The method starts at step 101 in which the mobile terminal UE1 has a radio communication link with one of the base stations, in this case the eNode B 60 shown in Figure 3, such that this base station provides coverage for a cell that is the serving cell for the mobile terminal UE1. When a handover is being considered from this cell, it can be referred to as the source cell for the handover.

While the mobile terminal UE1 has a radio communication link with the eNode B 60, it is also making measurements on transmissions from other base stations,

At step 103, the mobile terminal UE1 reports neighbour cell information to the radio base station system with which it is communicating, i.e. the source cell eNode B 60. This measurement report is shown as message M1 in Figure 3. The measurement report may be event-triggered or periodic indicating the eNode B 70 in a second cell, having the cell-id (8), as a handover candidate. In the context of the handover from the source cell to this second cell, this second cell can be referred to as the target cell.

An event-triggered measurement report typically follows an evaluation by the mobile terminal that the signal strength (or some alternative parameter) of the target cell exceeds the signal strength of the source cell by some threshold (for example 3dB), and thus that a handover to the target cell should be performed. A periodic measurement report is typically evaluated by the core network, which may determine that a handover should be performed. The mobile terminal UE1 is able to detect only non-unique cell identity information, for example cell-id information, in the transmission from the target cell eNode B 70.

At step 105, the radio base station system 60 receives the neighbour cell information from the mobile terminal. It will be noted that the RBS uses the neighbour cell information from one or more mobile terminal to form its neighbour cell list (Ncell list), which is typically used as the neighbour cell list for each mobile terminal that is active in the cell.

At step 107, the radio base station system 60 determines whether unique cell identity information, such as a CGI, is available for the cell identified in the message M1. This availability is ascertained by determining whether the cell-id exists in a neighbour cell list which includes an identity map 62 relating non-unique (cell-id) cell identity information to unique (CGI) cell identity information.

If the CGI is available in the RBS, then the RBS is able to send a handover command (step 109) to the mobile terminal, if required, and it is possible to perform a handover (step 111) to the target cell.

If it is determined at step 107 that the source cell radio base station system 60 has no translation to CGI stored in the Ncell list 62 for the neighbour cell with cell-id 8, the process passes to step 113, in which a handover command is sent to the mobile terminal

UE1 (message M2 in Figure 3). The handover command identifies the target cell by means of the non-unique cell identity information, i.e. the cell-id 8, and contains source cell information, including at least the source cell CGI (CGI(S)) and source cell cell-id (Cell id(S)), and preferably also contains a handover reference (HO ref).

5

This handover command may be referred to as a "forced handover" command or a "cell id handover" command, and is in fact somewhat similar to a cell change command, in that no resources have been allocated for the mobile terminal in the new call, since the source cell is not able to identify the target cell with certainty, as required for a conventional handover.

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In step 115, the mobile terminal makes an access request to the target cell (message M3 in Figure 3). The access request may be a contention-based random access, made on handover random access resources provided for this purpose, or may be made on random access resources used also for call set-up. Following receipt from the target cell of a channel assignment, or a grant for it to transmit on a shared channel, the mobile terminal then sends (step 117) the source cell CGI (CGI(S)) and source cell cell-id (Cell id(S)), and preferably also sends the handover reference (HO ref).

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The source RBS receives target information from the target cell, which is able to communicate with the source cell since it has received the CGI information (step 119). The source cell is therefore able to update its CGI to cell-id map using the information received from the target cell. In addition, the target cell is able to update its own CGI to cell-id map using the received information concerning the source cell.

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The target cell radio base station system, i.e. the eNode B 70, is then able to use this source cell information (i.e. the source cell CGI (CGI(S)) and source cell cell-id (Cell id(S)), to update its own Ncell list (step 119), and in particular the identity map 72. The source cell information can also be used for detecting whether a cell-id collision (i.e. two or more cells having the same cell-id in the Ncell list) has occurred, implying that there is an error in the frequency-reuse planning system, or whether two or more cell-ids are associated with the same CGI, implying an error in the list.

A handover can then be performed, using any convenient handover method, the details of which are not relevant to the performance of the present invention. For example, the core network can be caused to set up the resources required for the handover. As an alternative, the target cell can initiate a "forward handover", according to the known
5 procedure, which be described further herein only briefly.

Specifically, the target cell, eNode B 70, sends a message (message M4A in Figure 3) to the source cell, containing the relevant handover information, namely the target cell CGI (CGI(T)) and target cell cell-id (Cell id(T)), and the handover reference (HO ref) previously
10 contained in the first handover message (M2) and the access request (M3). This message can advantageously be sent over the X interface between the eNodeB 60 and the eNodeB 70, as shown in Figure 3.

In response (message 5 in Figure 3), the source cell, eNode B 60, can send a message
15 containing the relevant mobile terminal context information. This response message also indicates to the target cell that the CGI-based address works. This response message can also advantageously be sent over the X interface.

The source cell, eNode B 60, is also able to use the target cell CGI (CGI(T)) and target
20 cell cell-id (Cell id(T)) to update its own Ncell list, including its identity map 62, as discussed above with reference to the updating of the Ncell list in the target cell.

When the handover is completed, a message is sent to the core network, causing the user
25 plane connection to the core network to be switched from the former source cell base station to the target cell base station.

Although the invention has been described above in the context of a handover from the first cell, served by the base station system 60, to the second cell, served by the base
30 station system 70, it will be apparent that each base station system is preferably able to perform the functions of the other. That is, the second cell, containing the eNode B 70, (the cell with CGI=25) can perform the procedures described above with reference to the first cell, when it is acting as the serving cell, for example for the second mobile terminal UE2 as shown in Figure 3.

As an alternative, on receipt of a mobile terminal measurement report with cell-id=9 from the second mobile terminal UE2, requesting a handover to the eNode B 60, i.e. the cell with CGI=23, the second cell base station system 70, now acting as the source cell, provides its CGI (CGI(T)=25) and cell-id (cell-id(T)=8) to the eNode B 60 using X2 signaling (messages M4B in Figure 3). Accordingly, eNode B 60 can update its Ncell lists.

If appropriate (although at the cost of more signaling), the CGI and cell-id can always be made available in the mobile terminal after handover access for the target cell to be used as information basis for error detection, for supporting adjustment of Ncell lists, and for understanding the statistical interaction between cells involved in handover.

Thus, there is disclosed a system in which, in the context of a handover, the target cell can, after receiving the mobile terminal access, contact the source cell using the CGI received and ask for the UE context and after receiving this context initiate a "forward handover" i.e. allocate appropriate resources for service continuation in the target cell and make the UE connect to these resources in the target cell.

Further, one cell with an updated Ncell list can make sure that the Ncell list in the other cell associated with the CGI cell-id pair is also updated. This is performed when sending a handover request, which indicates that it is using a newly updated cell-id to CGI pair in the Ncell list. The cell-id and CGI are also provided for the new source cell (the old target cell), and, possibly, also for the previously obtained old source cell handover reference in the handover request signal sent to the old source cell (now a new target cell). This information is then used in the new target cell to update its Ncell list with cell-id to CGI translation. Accordingly, if handover is done in both directions Ncell lists of both cells will be updated, and a bidirectional relationship is established.

When such a bidirectional relationship is created, the cells are able to detect cell-id to CGI translation errors.

A handover can thus be performed even if the source cell does not have the cell-id to CGI translation included in its Ncell list.

CLAIMS

1. A method for providing cell identity information from a first cell to a second cell in a mobile telecommunications system, the method comprising, in the first cell:
5 supporting a radio communication link with a mobile terminal, thereby functioning as a source cell in relation to the mobile terminal;
receiving (105) from the mobile terminal non-unique identity information relating to the second cell;
determining (107) whether a unique identity information relating to the second cell
10 can be determined from said non-unique identity information; and, if not:
sending (113) a first handover command to the mobile terminal, wherein said first handover command indicates by using said non-unique identity information said second cell as a target cell, and contains unique identity information and non-unique identity information relating to the source cell.
15
2. A method as claimed in claim 1, wherein said step of determining whether the source cell can determine unique identity information relating to the second cell from said non-unique identity information comprises checking an identity map which relates non-unique cell identity information to unique cell identity information for at least one cell in
20 said system.
3. A method as claimed in claim 1 or 2, comprising receiving said non-unique identity information relating to the second cell from the mobile terminal following an evaluation by said mobile terminal that a handover to the second cell is required.
25
4. A method as claimed in claim 1 or 2, comprising receiving said non-unique identity information relating to the second cell from a network node following an evaluation by the network node that a handover to the second cell is required.
- 30 5. A method as claimed in claim 4, comprising receiving from the mobile terminal with said non-unique identity information a quality measurement made by the mobile terminal relating to the second cell, for the evaluation of the handover to the second cell.

6. A method as claimed in any preceding claim, wherein said first handover command does not specify a dedicated resource for said mobile terminal in said second cell.

5 7. A method as claimed in any preceding claim, wherein the first handover command includes handover reference information.

8. A method as claimed in claim 2, or in any of claims 3 to 7 when dependent thereon, further comprising:

10 receiving (119) from said second cell unique identity information and non-unique identity information, and storing (121) said unique identity information and said non-unique identity information in said identity map.

15 9. A radio base station system, for supporting radio communication in at least one first cell of a plurality of cells in a wireless telecommunications system, wherein the radio base station system is adapted to:

support radio communication with at least one mobile terminal in the first cell, the first cell thereby being defined as a source cell for the mobile terminal;

receive from the mobile terminal non-unique identity information relating to a second cell

20 determine whether it can determine unique identity information relating to the second cell from said non-unique identity information; and, if not:

send a first handover command to the mobile terminal, wherein said first handover command indicates said second cell as a target cell, and contains unique identity information and non-unique identity information relating to the source cell.

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10. A radio base station system as claimed in claim 9, having an identity map which relates non-unique cell identity information to unique cell identity information for at least one cell in said system other than said first cell, and being adapted to determine whether unique identity information relating to the second cell can be determine from said non-unique identity information by checking said identity map.

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11. A radio base station system as claimed in claim 9 or 10, wherein said first handover command does not specify a dedicated resource for said mobile terminal in said second cell.

12. A radio base station system as claimed in claim 9, 10 or 11, wherein said radio base station system is further adapted, if it determines that it can determine unique identity information relating to the second cell from said non-unique identity information, to:

5 establish a dedicated resource for said mobile terminal in said second cell; and
 send a second handover command to the mobile terminal, wherein said second handover command indicates said second cell as a target cell, and identifies said established dedicated resource.

10 13. A radio base station system as claimed in any of claims 9 to 12, wherein the first handover command includes handover reference information.

14. A radio base station system as claimed in claim 10, or in any of claims 11 to 13 when dependent thereon, further adapted to:

15 receive from said second cell unique identity information and non-unique identity information, and store said unique identity information and said non-unique identity information in said identity map.

16. A radio base station system as claimed in claim 14, having an interface for
20 connection to other radio base station systems, and being adapted to receive said unique identity information and non-unique identity information from said second cell by means of said interface.

16. A method for updating information, relating to a first cell of a mobile
25 telecommunications system, the method comprising, in a second cell:

 receiving (113) an access request from a mobile terminal, wherein the access request contains unique identity information and non-unique identity information relating to the first cell; and

30 updating a neighbouring cell list in said second cell to include the unique identity information and the non-unique identity information relating to the first cell.

17. A method as claimed in claim 16, further comprising:

if said neighbouring cell list in said target cell already includes the unique identity information relating to the source cell in association with different non-unique identity information, identifying an error condition.

5 18. A method as claimed in claim 16 or 17, further comprising:
initiating a handover of said mobile terminal from said source cell to said target cell.

19. A method as claimed in one of claims 16 to 18, wherein said access request
contains a handover reference, the method further comprising:
10 transmitting to said source cell a message containing said handover reference and
unique identity information and non-unique identity information relating to said target cell.

20. A radio base station system, for supporting radio communication in at least a second
cell of a plurality of cells in a wireless telecommunications system, wherein the radio base
station system is adapted, on receipt from a mobile terminal of an access request,
15 wherein the access request contains unique identity information and non-unique identity
information relating to a first cell, to:
update a neighbouring cell list in said second cell to include the unique identity
information and the non-unique identity information relating to the first cell.

20 21. A radio base station system as claimed in claim 20, being further adapted:
if said neighbouring cell list in said second cell already includes the unique identity
information relating to the first cell in association with different non-unique identity
information, to identify an error condition.

25 22. A radio base station system as claimed in claim 20 or 21, further adapted to:
initiate a switch from the first cell to the second cell of a link through a core network
to said mobile terminal.

30 23. A radio base station system as claimed in one of claims 20 to 22, wherein said
access request contains a handover reference, the radio base station system being
further adapted to:
transmit to said first cell a message containing said handover reference and unique
35 identity information and non-unique identity information relating to said second cell.

24. A method of performing a handover in a mobile terminal of a wireless telecommunications system that defines a plurality of cells, the method comprising:

communicating in a first cell, acting as a source cell;

5 measuring quality and identifying non-unique cell identity information of a target cell;

reporting (103) the target cell non-unique identity information to the source cell;

receiving (113) from the source cell an instruction on forced handover to the target cell, which forced handover instruction includes non-unique cell identity information and unique cell identity information relating to the source cell; and

10 sending (115) an access request to the target cell, said access request containing the non-unique cell identity information and unique identity cell information relating to the source communications cell.

25. A method as claimed in claim 24, wherein said access request further comprises

15 handover reference information.

26. A method as claimed in claim 24 or 25, comprising measuring the quality and identifying the non-unique cell identity information of the target cell by receiving broadcast information from said target cell; and further comprising, before reporting the target cell

20 non-unique identity information to the source cell:

determining that said target cell is a suitable handover candidate.

27. A mobile terminal for use in a wireless telecommunications system that defines a plurality of cells, the mobile terminal comprising a controller (42) operable to cause the

25 mobile terminal to:

communicate in a first cell, acting as a source cell;

measure quality and identifying non-unique cell identity information of a target cell;

report the target cell non-unique identity information to the source cell;

receive from the source cell an instruction on forced handover to the target cell,

30 which forced handover instruction includes non-unique cell identity information and unique cell identity information relating to the source cell; and

send an access request to the target cell, said access request containing the non-unique cell identity information and unique identity cell information relating to the source communications cell.

28. A mobile terminal as claimed in claim 27, wherein the access request further comprises handover reference information.

5 29. A mobile terminal as claimed in claim 26 or 27, wherein the controller further causes the mobile terminal to:

measure the quality and identify the non-unique cell identity information of the target cell by receiving broadcast information from said target cell; and, before reporting the target cell non-unique identity information to the source cell, to:

10 determine that said target cell is a suitable handover candidate.

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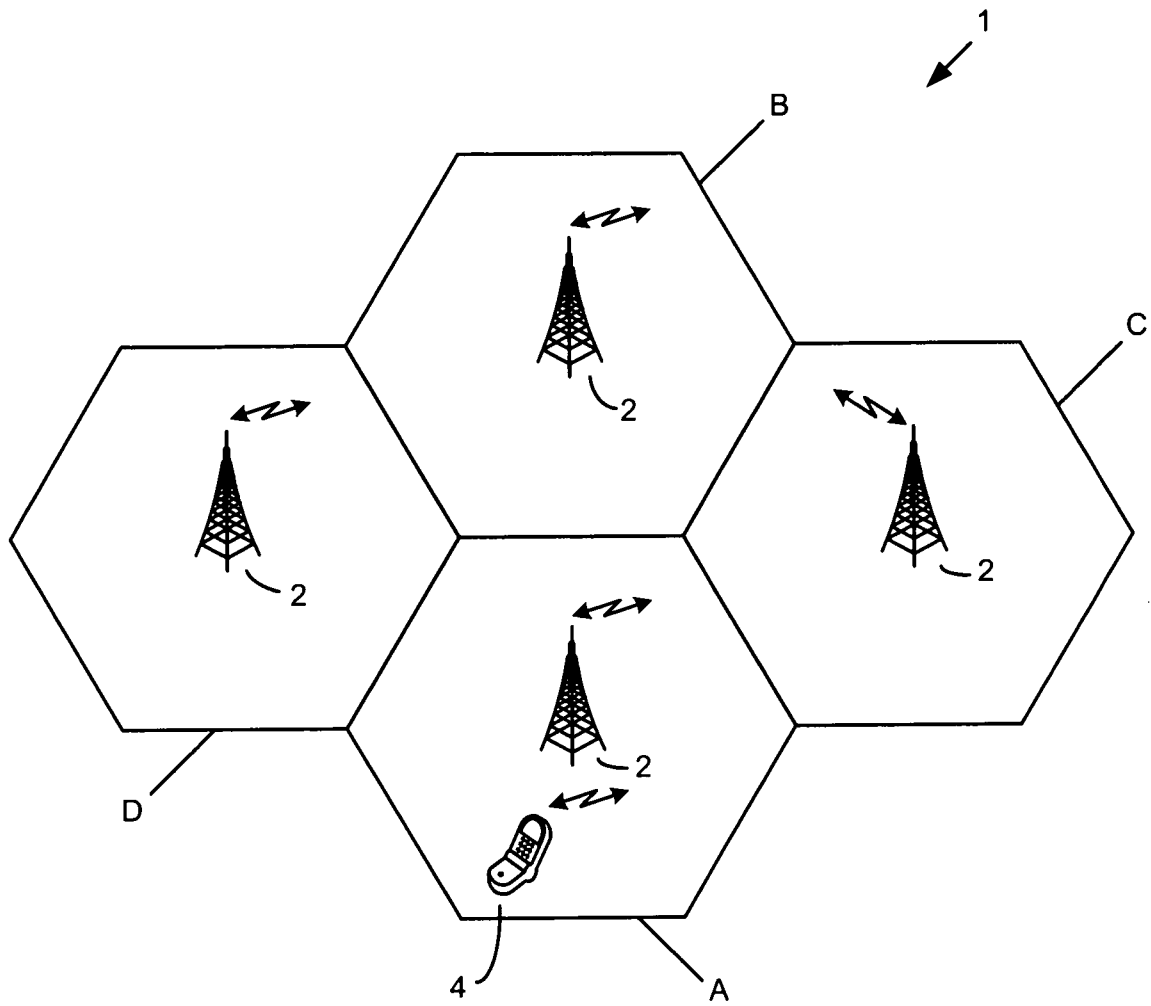


Figure 1

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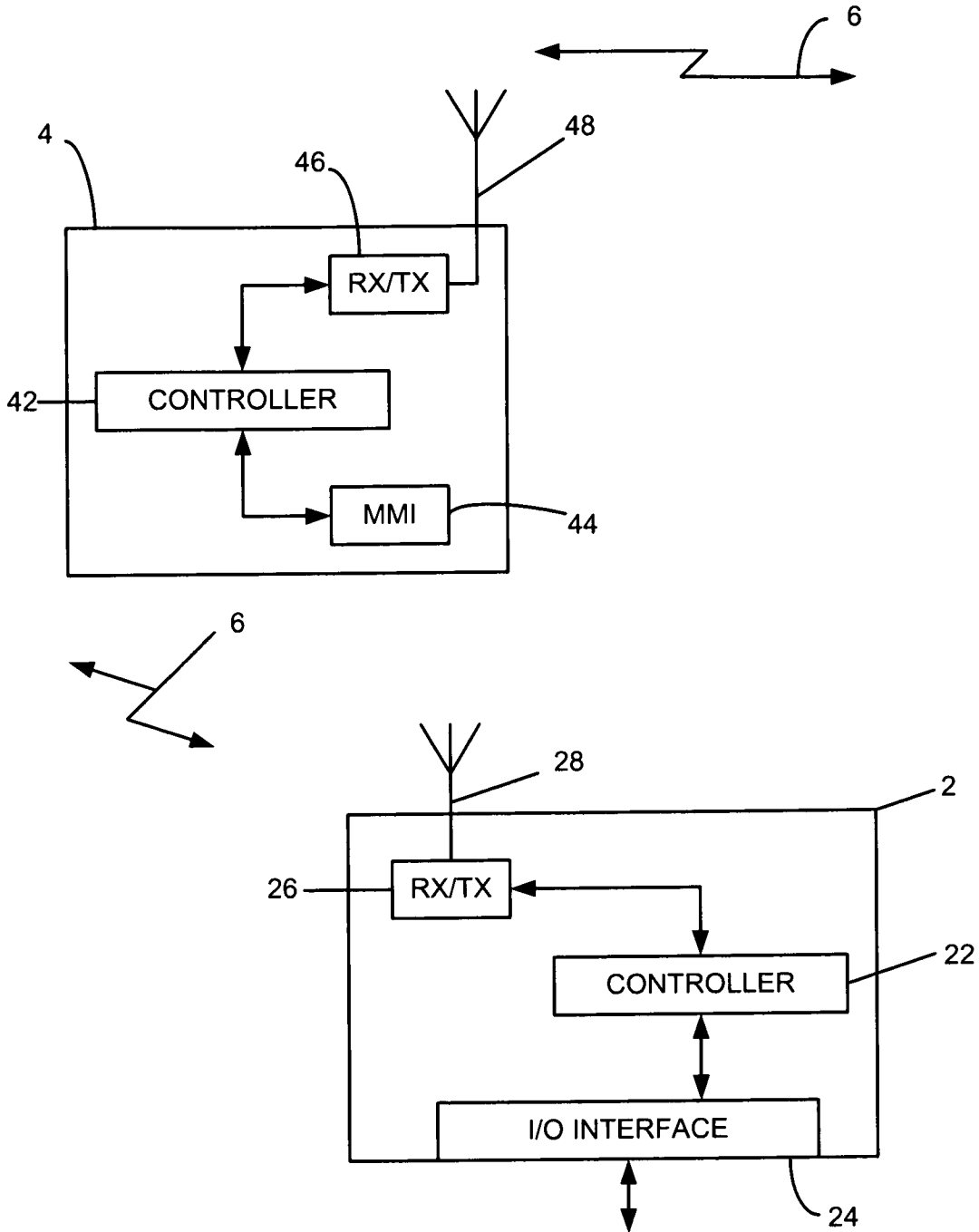


Figure 2

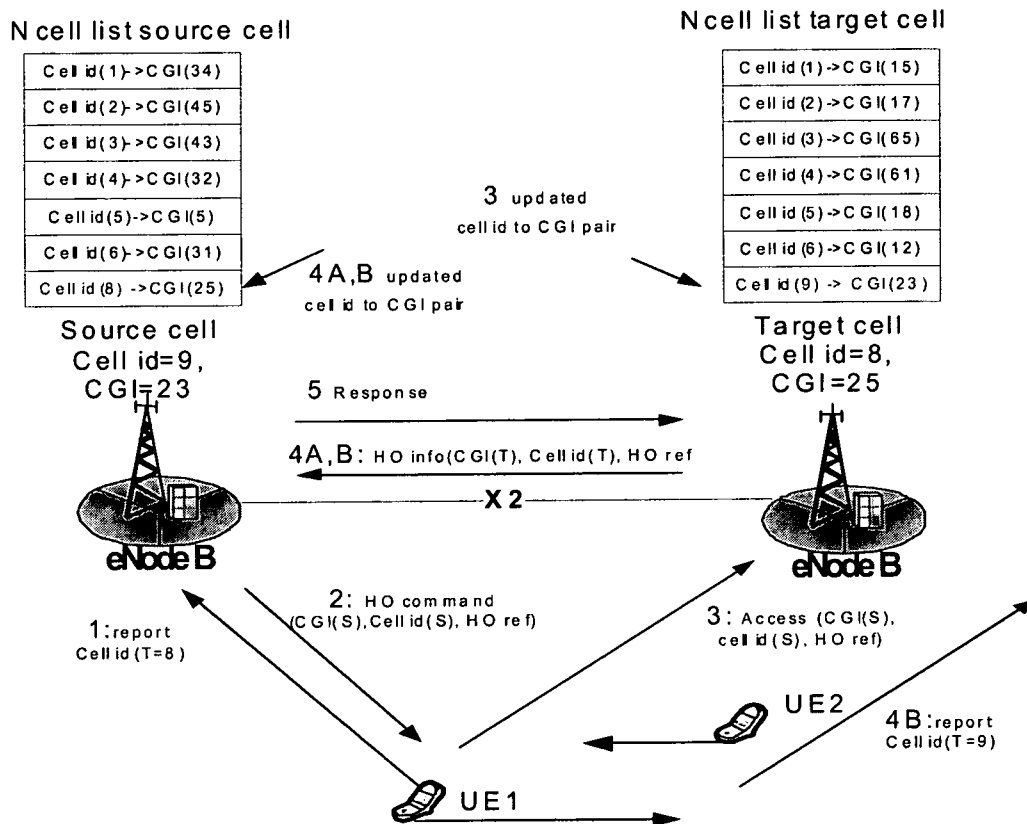


Figure 3

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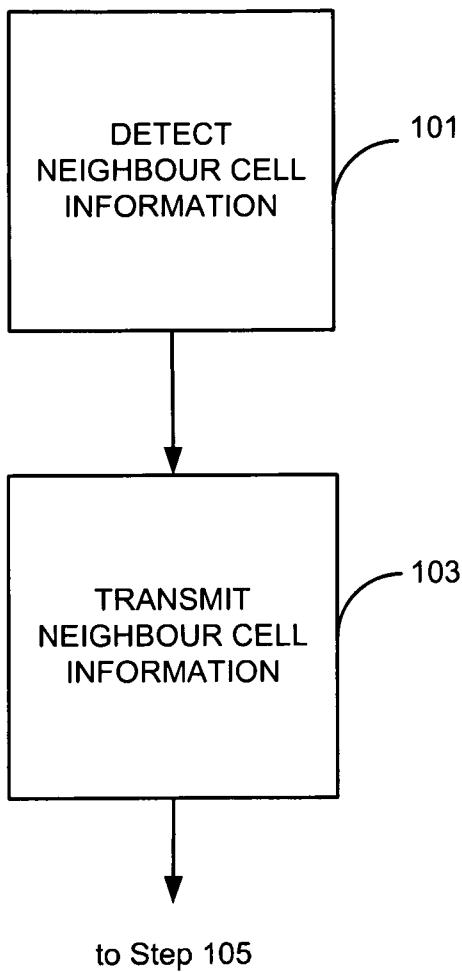


Figure 4

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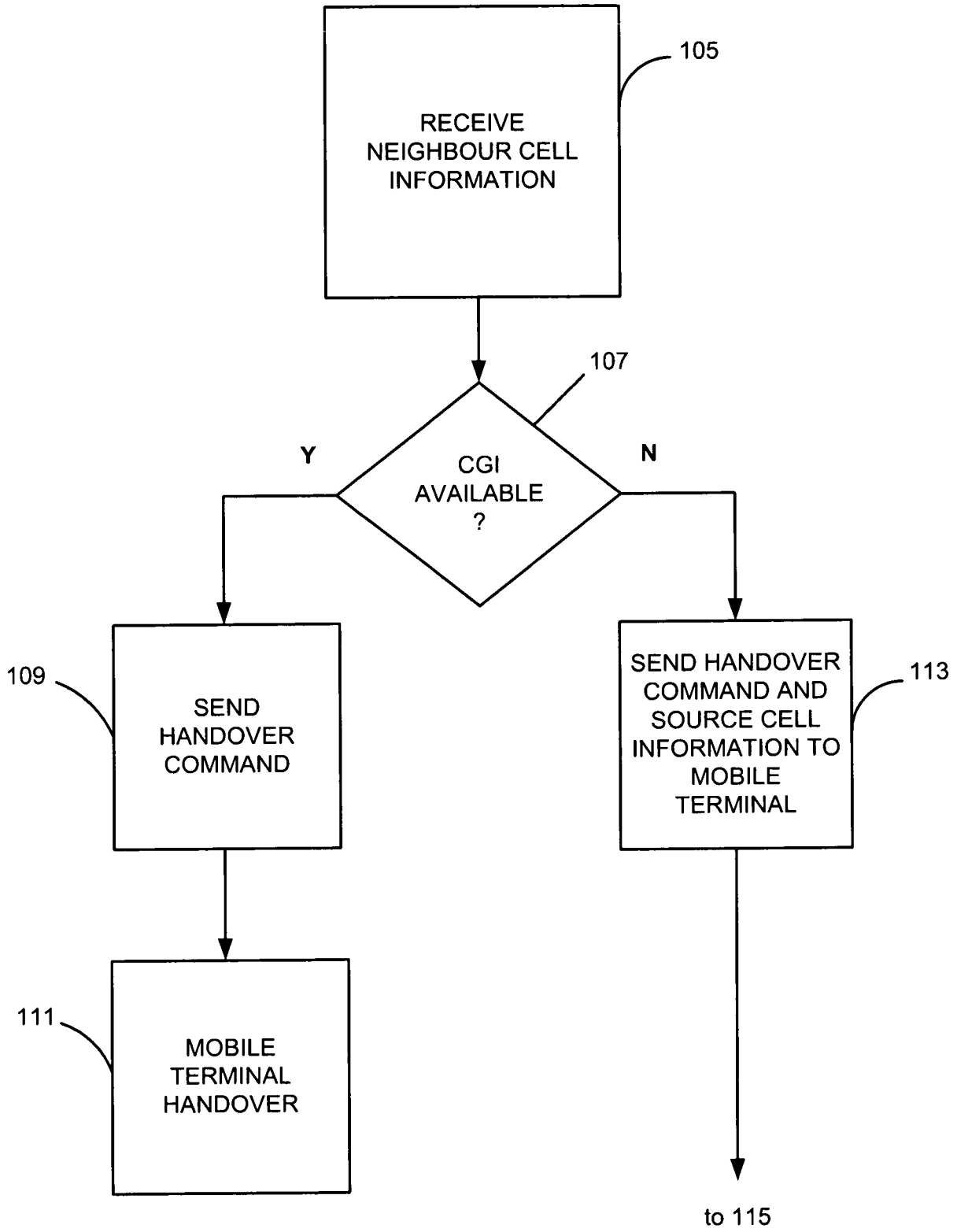


Figure 5

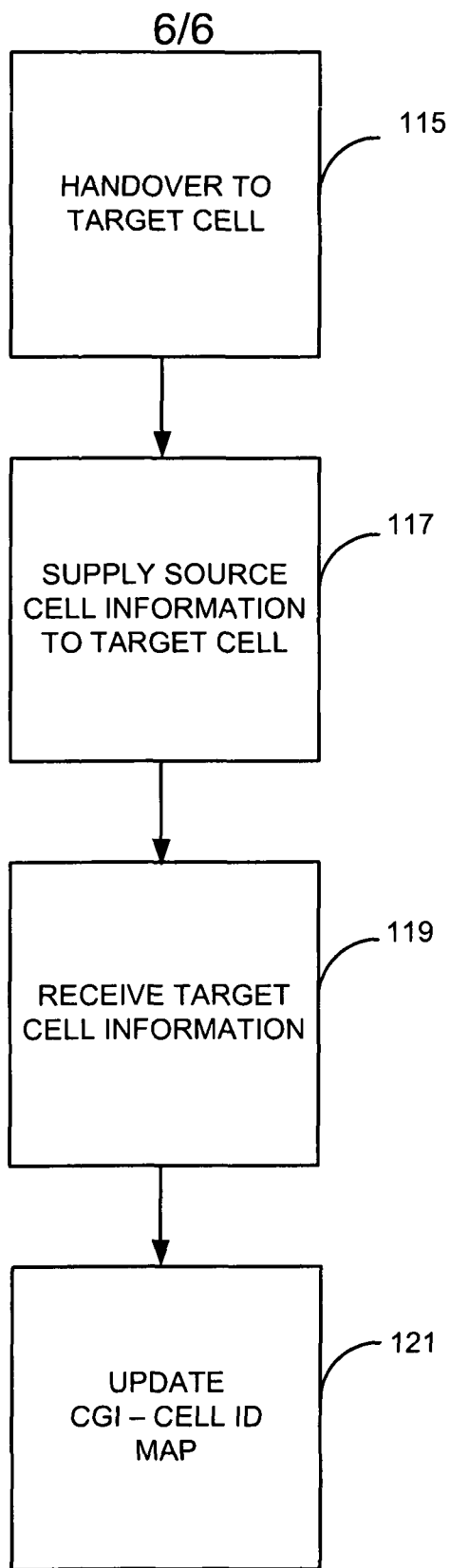


Figure 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/002347

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04Q7/38
ADD. H04Q7/32

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)
H04Q

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2005/099185 A (ERICSSON TELEFON AB L M [SE]; VIKBERG JARI [SE]; NYLANDER TOMAS [SE];) 20 October 2005 (2005-10-20) abstract page 13, line 7 - page 15, line 16 -----	1-29
A	WO 2005/079083 A (ERICSSON TELEFON AB L M [SE]; VIKBERG JARI TAPIO [SE]; NYLANDER TOMAS) 25 August 2005 (2005-08-25) abstract page 11, line 14 - page 15, line 15 -----	1-29
A	WO 2006/061671 A (ERICSSON TELEFON AB L M [SE]; VIKBERG JARI TAPIO [SE]; NYLANDER TOMAS) 15 June 2006 (2006-06-15) abstract page 6, line 14 - page 8, line 19 page 10, line 6 - page 10, line 23 -----	1-29
-/--		

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See patent family annex.

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Date of the actual completion of the international search

Date of mailing of the international search report

3 December 2007

14/12/2007

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/002347

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2007/010304 A (IP ACCESS LTD [GB]; PIERCY NEIL [GB]; JOHNSON NICK [GB]) 25 January 2007 (2007-01-25) abstract page 10, line 1 - page 12, line 15 -----	1-29

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2007/002347

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005099185 A	20-10-2005	CN 1930828 A EP 1730900 A1 US 2007264996 A1	14-03-2007 13-12-2006 15-11-2007
WO 2005079083 A	25-08-2005	CN 1918922 A EP 1723812 A1	21-02-2007 22-11-2006
WO 2006061671 A	15-06-2006	EP 1820362 A1	22-08-2007
WO 2007010304 A	25-01-2007	NONE	