Neutral Citation Number: [2015] EWHC 1034 (Pat)

Case No: HP 2011 000001
HC 11 C 02064

IN THE HIGH COURT OF JUSTICE
CHANCERY DIVISION
PATENTS COURT

Royal Courts of Justice, Rolls Building
Fetter Lane, London, EC4A 1NL

Date: 24/04/2015

Before:

MR JUSTICE BIRSS

- -

Between:

IPCOM GMBH & CO KG	**Claimant**
- and -	
(1) HTC EUROPE CO. LTD	
(2) BRIGHT POINT GREAT BRITAIN LIMITED	
(3) HTC CORPORATION	**Defendants**
- and -	
NOKIA CORPORATION	**Opponent to Amendment Application**

- -

Iain Purvis QC and **Brian Nicholson** (instructed by **Bristows**) for the **Claimant**
Adrian Speck QC and **James Abrahams** (instructed by **Hogan Lovells**) for the **Defendants**
Nokia did not appear and were not represented

Hearing dates: 10th, 11th, 13th March 2015

- -

Judgment

Mr Justice Birss:

Topic	**Paragraph**

Introduction

1. This action relates to European Patent (UK) 1 841 268 ("Access of a mobile station to a random access channel in dependence of its user class"). The patent claims priority from a German filing on 8th March 1999. It is a divisional. The patent was granted on 17th March 2010. Originally part of the portfolio of Robert Bosch GmbH, today the patent belongs to IPCom.

2. The defendants can be referred to together as HTC. HTC manufacture and sell telecommunications equipment, including mobile phones. IPCom contends that the patent is essential to the relevant UMTS mobile telecommunications standard and is infringed by certain HTC mobile phones (the phones in class A). If these phones do infringe then it is also agreed that the patent is essential to the UMTS standard. HTC deny infringement. HTC also seek a declaration of non-infringement relating to other types of phone (classes B to G). HTC contend that if the claim is to be construed in such a way that the class A phones infringe then the claim must be invalid for added matter. There are also points on amendment.

3. The background to this dispute is lengthy and complicated. The subject matter of this patent was first litigated in the UK in an action between Nokia and IPCom about the parent patent (EP 1 186 189). That trial was heard in late 2009 and came before Floyd J (as he then was). He revoked the parent patent ([2009] EWHC 3482 (Pat)). That judgment was upheld on appeal ([2011] EWCA Civ 6). However that was not the end of the matter because by then this divisional patent had been granted. It came before Floyd J, again in a trial between Nokia and IPCom, in April 2011. He held the patent was valid in an amended form and was infringed: [2011] EWHC 1470 (Pat) (and see [2011] EWHC 1871 (Pat) on essentiality). That judgment was upheld on appeal on 10th May 2012 ([2012] EWCA Civ 567). However that was not the end of the matter either because the patent is also subject to opposition proceedings in the EPO. In a decision dated 18th May 2012 the Opposition Division of the EPO decided that the patent in its form as granted was invalid for added matter (Art 123(2) EPC) and revoked it. A proposed amendment was refused because it would extend the scope (Art 123(3) EPC). On 7th March 2013 the EPO Technical Board of Appeal heard the appeal from the Opposition Division. That was not the end of the matter. In the course of the hearing itself IPCom filed a new "main request" (in other words it amended the claim). The Board of Appeal decided (decision T 1282/12) that the new main request satisfied Arts 123(2) and 123(3) and remitted the case back to the first instance for the Opposition Division to further examine the new claim. The

Opposition Division has now upheld the validity of the patent with the claim in the form of the main request and the case is now pending again before the Board of Appeal.

4. Meanwhile these proceedings began on 16th April 2012. The overall dispute involves FRAND questions and technical questions. In August 2012 this trial (the technical trial) was stayed pending the appeal in the EPO from the Opposition Division's decision in May 2012. Directions were given for the FRAND dispute between HTC and IPCom to be tried along with what was then to be a FRAND trial between Nokia and IPCom. Following the March 2013 decision of the EPO Board of Appeal, in May 2013 the FRAND trial was vacated and the preparation for this technical trial recommenced. In November 2013 this technical trial was relisted to be heard in March 2015.

5. IPCom has applied to amend this patent (the EP (UK)) to put the claims in the same form as they were allowed by the EPO Board of Appeal. This bears some explanation.

6. Owing to the suspensive effect of appeals in the EPO (Art 106(1)) as far as the EPO is concerned the patent in fact remains in its form as granted but that is a temporary state of affairs. By taking the course it has in the EPO, IPCom has given up the granted claims. The only outcomes from the EPO which are now possible under EPO procedure are that the patent is allowed in an amended form or revoked. Whichever course the EPO process takes will have a corresponding effect in the UK. However until the EPO process is complete, as I have said, as far as the EPO is concerned the patent has not been amended as compared to its granted state. Thus in order for this dispute to be decided on the basis of the claims actually live before the EPO and which IPCom wants, the patentee has applied to amend.

7. Neither side disputes the detailed reasoning of Floyd J or the Court of Appeal in the judgments concerning this patent. Thus although at one stage HTC challenged the validity of the patent on a wider range of grounds, before me the only issues which arise are consequential on the changes to the granted claim brought about by the amendment IPCom seeks to make.

The issues

8. As granted the patent had two claims but there is no need to focus on claim 2. Claim 1 as granted, translated into English and broken down as it was considered by Floyd J, is in this form:

> Mobile station for operation in a UMTS mobile radio network
>
> in which multiple user classes are distinguished
>
> *characterised in that the mobile station is arranged*
>
> to read a user class from a SIM card

> to receive access threshold value bits and access class information over a broadcast control channel
>
> to determine an access threshold value from the access threshold value bits
>
> to use the access class information relevant for the user class to determine whether
>
> the mobile station is permitted to access a random access channel, for example RACH, independent of the received access threshold value bits
>
> or whether the access permission for the random access channel, for example RACH, is determined on the basis of an evaluation of the access threshold value.

9. Floyd J directed that the claim should be amended so as to insert the words "*by comparison of the access threshold value with a random number or pseudo random number*" at the end of the claim (see judgment paragraph 153 and see the form set out by the Court of Appeal at judgment paragraph 44). That is the form of the claim in the UK designation of the patent today.

10. IPCom's application is to amend the patent so that it has a single claim the form of which can be seen as follows:

> Mobile station (5, 10, 15, 20) for operation in a UMTS mobile radio network in which multiple user classes (35, 40) are distinguished, in which information signals with access authorization data are transmitted to the mobile station, wherein the access authorization data are transmitted as a bit pattern, characterised in that the mobile station (5, 10, 15, 20) is arranged:
>
> - to read a user class (35, 40) from a SIM card (75),
>
> - to receive the access authorization data, which have access threshold value bits (S3, S2, Sl, S0) and access class ~~information~~ bits (Z0, Z1, Z2, Z3) over a broadcast control channel (25)
>
> - to determine an access threshold value (S) from the access threshold value bits (S3, S2, S1, S0), if the access authorization for the random access channel is determined on the basis of an access threshold value evaluation
>
> - ~~to use~~ by means of the access class ~~information~~ bit (Z0, Z1, Z2, Z3) relevant for the user class (35, 40) to determine whether the mobile station (5, 10, 15, 20) is permitted to access a random access channel, for example RACH, independent of the received access threshold value bits (S3, S2, S1, S0), or whether the access ~~permission~~ authorization for the random

> access channel, for example RACH, is to be determined on the basis of an evaluation of the access threshold value, and is arranged to compare ~~by comparison of~~ the access threshold value (S) with a random number or pseudo random number (R) as the access threshold value evaluation, and is arranged to access the random access channel dependent on the determination using the access class bit, either independent of the received access threshold value bits (S3, S2 S1, S0) or dependent on the result of the comparison.

11. This is the same as the form of the main request accepted by the Board of Appeal in its decision. The underlining and striking out depict amendments as compared to the current UK form of the claim.

12. The issues I have to decide (in no particular order) are:

    i) The true construction of this claim and whether devices operating according to the UMTS standard infringe. There are two points, both arising from the proposed amended claim. The first relates to the words "transmitted as a bit pattern" and the second to the words "access class bit".

    ii) Whether the amendment should be permitted. The grounds relied on to oppose the amendment are:

        a) Added matter;

        b) Lack of clarity;

        c) Discretion.

    iii) Whether the HTC devices in class A infringe the claim and whether the patent is essential to the UMTS standard.

    iv) Whether the HTC devices in classes B to G infringe the claim.

13. If I refuse the amendment then it is common ground that the patent must be revoked. IPCom accepted that revocation was the right outcome if the amendment is refused but said that that was without a concession as to the invalidity of the unamended patent. It is correct that IPCom does not concede that the unamended patent is invalid, but neither does it contend that the patent in the form hitherto upheld by the English courts is valid. IPCom's position on that is recorded in paragraph 2(b) of an Order of the court dated 23rd January 2015. Since, if the amendment is refused, the patent will be in a form which the patentee does not contend is valid, it seems to me to be right that the only thing the court can do in such a case is revoke it.

The witnesses

14. IPCom called Dr James Irvine as an expert. He is a Reader in the Institute of Communications and Signal Processing at the Department of Electronic and Electrical Engineering of the University of Strathclyde. He has worked in electronics and telecommunications since 1989. A particular focus of his work has been in channel coding.

15. HTC did not criticise Dr Irvine's oral evidence (rightly so). They did submit that care needed to be taken with his written evidence on the basis that the reports did not fairly reflect his complete views. The points taken were particular matters which, to the extent they are relevant, can be addressed in context below. They do not undermine the general weight I might place on Dr Irvine's views or suggest any lack of impartiality on his part.

16. HTC called Mr Paul Simmons as an expert. He is a Chartered Engineer and has worked as an independent consultant since 2010. He has worked in telecommunications engineering for thirty years. He was one of the engineers who composed the original technical nucleus for GSM and has worked in mobile radio standards ever since. Much of his time was spent at Nortel Networks Corporation.

17. IPCom submitted Mr Simmons was trying to assist the court but that there were unsatisfactory areas which suggested that he tended to look for arguments to support a thesis rather than to build a thesis based on objective evidence. I did not detect that tendency in either his oral or written evidence. Mr Simmons did make a mistake about the interpretation of a paper by a team at Qualcomm which related to the relative frequency of signals sent on the broadcast channel in UMTS. He corrected the error in chief. Mr Purvis suggested that the error could only have been made because the expert had assumed the paper supported his thesis when in fact it showed the opposite. There is nothing in this point. No doubt Mr Simmons did not realise he had misinterpreted the paper initially because the misinterpretation was consistent with his view (supported by other material too) that some system information might be sent more frequently on the channel than other information, when in fact the paper shows the relevant information is sent at the same frequency in the networks tested. But he corrected his error. That shows an expert properly conducting himself in accordance with his duties to the court. It does not show a lack of objectivity. The other point relied on concerned a dispute about the words "28 bit pattern" which appear in the GSM standard. I will address the point below in context. Whatever the answer is to the argument about the meaning of that phrase in the GSM standard, his evidence about it was not "argumentative and closed minded", as IPCom suggested.

18. In my judgment both Dr Irvine and Mr Simmons were well qualified to address the technical issues arising in this case. Both gave their evidence fairly and aiming to help the court. I am grateful to them both for their assistance.

19. Each side also called evidence from witnesses directed to a dispute about what happened at the EPO hearing on 7th March 2013 and the significance of those events. The language of the proceedings was German. The other witnesses were:

    i) Susanne Hinterleitner (formerly Deutsch) an English/German translator and native German speaker called by HTC. She did not attend the EPO hearing. Her evidence addresses the meaning of certain German text.

    ii) Friedrich R von Samson-Himmelstjerna, a patent attorney who attended the hearing acting for Nokia.

    iii) Ansgar Bergmann, a consulting engineer who attended the hearing as a consultant for Nokia.

iv) Eric Emde, who represented HTC at the hearing.

v) David Gideon Molnia, a patent attorney who represented IPCom at the hearing.

20. The parties do not accept each other's evidence about the EPO hearing but agreed that little would be gained by cross-examination. Each party is entitled to make such submissions about weight as it thinks fit.

The skilled addressee or team

21. The parties agreed with the characterisation in Floyd J's judgment of the skilled addressee and various other important aspects of this case. Some of them were also adopted by the Court of Appeal and none were criticised on appeal. I can and will gratefully adopt all these passages without amendment. The skilled addressee is dealt with by Floyd J in paragraphs 6 and 7:

> "6. The 268 patent is addressed to an engineer or team of engineers concerned with developing mobile phones for use in the UMTS mobile telecommunications standard, and in particular in developing systems for control of access to the random access channel (RACH). In my judgment on the parent patent I explained that those working on the GSM standard project were engineers of the highest calibre: see [37]. The same clearly applies to those involved in the UMTS project.
>
> 7. There is no dispute that the skilled addressee would have available the various standards such as GSM, GSM/GPRS and IS-95 and the current state of the UMTS recommendations. These are very extensive documents, and no skilled team could be expected to have or keep even a tiny fraction of their contents in its collective head. But the skilled team would know where in these documents to find information relevant to the task in hand."

Common general knowledge

22. The common general knowledge is addressed by Floyd J in paragraphs 8 to 10 of his judgment:

> "8. Mobile telecommunications networks are complex structures. The general nature of such networks has been described in a number of judgments, and I do not need to repeat that exercise here. This case is concerned with how one controls access by the mobiles to a random access radio channel or RACH between the mobile and the base station (the "uplink"). In the parent case I said this about the technical

background to the 189 patent. It is useful to set it out here as well:

> *Contention on a shared channel*
>
> Where the uplink from a mobile station is a shared random access channel, there is a danger of collision between users' signals, allowing stronger signals through and preventing weaker ones. This competition is called "contention". It can be tackled in numerous ways. One set of ways in which the problem is tackled is by restricting access to the channel.
>
> *The "lottery"*
>
> One well known way of restricting access to the channel involved a form of lottery. "Lottery" is not a term of art, but is a convenient term to provide an analogy for what is done. Each mobile station generates for itself a random number and compares it with a value sent by the network. A "win" can be defined as generating a random number greater than or equal to the transmitted value. So, for example, the possible transmitted numbers could be 1 to 10, and the random numbers could be 1 to 9. If the base station transmits a 10, no mobile will get onto the channel, but if it transmits a lower number than 10 an increasing proportion of mobiles can get on. At busy times the access can be throttled back to prevent collision. At very low usage times the transmitted value could be 1, and all mobiles would get access…
>
> *Access classes*
>
> Systems in which certain classes of user (user classes or access classes) could be restricted from access were also well known. For example class barring, under which a mobile of a particular class would be barred from access absolutely, was a feature of the GSM/GPRS system.
>
> *Transmission capacity*
>
> Bandwidth is a scarce resource in any mobile telephone system. Designers of such systems would try to arrange matters so as to minimise the amount of data that had to be sent routinely. One common general knowledge way of limiting the amount of data to be sent is the use of single bit flags, which alert the mobile to the fact that data is coming. This allows the network only to send the data when the flag is set.

> 9. I should add something about UMTS, as claim 1 is limited to a mobile for use in a UMTS network. UMTS is a third generation mobile telecommunications standard. At the priority date of and at the date of application for the patent, the standard was not complete: there were gaps in the specification of the standard.
>
> 10. UMTS is a code division multiple access system (CDMA). The details of CDMA do not matter for present purposes except in very limited respects. One aspect of CDMA is that of frequency sharing between channels. This means that there is at least the potential for channels to interfere with each other. Interference is a function of the load carried by the channel. A second point is that it was envisaged at the priority date that, in UMTS, the use of the RACH would not be restricted to the sending of channel requests. It would also be used to send small data packets. Thirdly, it was clear that UMTS would offer multiple services, including voice and at least one type of data service. These are points which are relied on by Nokia to suggest that a random access scheme for UMTS required more in the way of flexibility than was necessary for earlier schemes."

23. Some further matters were identified as part of the common general knowledge which had not been relevant before.

24. First, there are points on data representation. Normally understood a bit is a single binary digit. Individual pieces of information are coded by adopting a convention such as using a binary number (as an eight bit binary number 00001000 means 8) or for example the ASCII coding scheme in which the character is coded by a number (so the character "8" is coded by 56 (in decimal) i.e. 00111000 (as an eight bit binary number)). The skilled person would know that you need a set of predefined rules to enable the relevant bits to be identified in a collection of bits.

25. When more than one item of information is to be transmitted, there is an added consideration: how to identify what data represents what item of information. One approach is to use a key value pair. Here each item of information comes in a pair consisting of an identifier (or key) and a value. The key tells the recipient what is being sent. The value is self explanatory. However key value pairs are not efficient because in addition to the inevitable need to use transmission resources to send the value, resources are also needed to send the key.

26. Another approach is to use context or position of data to convey what it relates to. The sender and the receiver agree the form in which the data will be sent in advance, so for the sake of argument the first four bits represent one piece of information and the next eight bits represent another. Then all that needs to be transmitted are the 12 bits of information. The information can be sent repeatedly in this way. The values can change but the repeating pattern tells you what the values relate to. Dr Irvine accepted this way of looking at it. The rules required to parse the collection of bits can be agreed in advance so as to avoid taking up transmission capacity.

27. Second is a point on protocol stacks and layers. These are well known. Their purpose is so that each layer can be treated as independent and so that communication can be considered across a network between peers at the same level in the stack.

28. Third is a point on logical channels. Logical channels (as opposed to physical channels) are a conceptual construct. Both the RACH and the BCCH are logical channels.

29. Fourth was a point about RACH access. HTC submitted that the problem of collisions when many users try to access a channel like RACH was well known, as were methods of controlling the problem such as class barring, priority and persistence. I do not think anything turns on this and it is largely covered by the passages I have already quoted from Floyd J's judgment, but in any case I accept HTC's submission.

The patent

30. The disclosure of the patent is introduced by Floyd J in paragraph 22:

> "22. Control of access to a radio channel was a well known problem in mobile telecommunication systems and is recognised in the 268 specification. So, at [0020], the specification points out that where the message from a mobile station collides with another message on the random access channel, the message is not received properly in the base station and the base station is unable to acknowledge its receipt. The mobile station accordingly tries again, leading to a danger that the random access channel will become overloaded."

31. The specification consists of a first general section which Floyd J addressed in paragraphs 23 to 27:

> "23. The specification starts, at [0001], by explaining that the invention is based on a mobile station for operation in a UMTS mobile radio network. A number of prior art specifications are then reviewed – more specifications than in the application for the patent. The specification then contains a section entitled "Advantages of the invention". The first of these paragraphs is [0009] which is in the following terms:
>
> > "By contrast, the inventive method and the inventive mobile or subscriber station having the features of the independent claims have the advantage that the access authorisation for this telecommunications channel can be randomly distributed for one or more subscriber stations. This access control uses a minimum of transmission capacity for transmitting the information signals, since it is effected merely by transmitting the access threshold value."

> 24. The random distribution of access to the channel to which this paragraph refers would be achieved by the lottery-based approach to access which was common general knowledge at the date of the patent. Moreover, "the features of the independent claims" do not include as a requirement any feature which would in fact achieve random distribution. IPCom seek to insert such a feature by means of their conditional application to amend, which would have the effect of making more sense of this paragraph. The skilled person would have to read further to determine what it was that the claimed invention delivers.
>
> 25. Paragraph [0010] describes the ability of the subscriber station to check from "access authorisation information with access class information" whether it is in a "prescribed user class" and, if so, for access to the channel to be granted on the basis of the access class information. The paragraph then continues:
>
> > "This permits subscriber stations of a prescribed user class to be authorized to use the telecommunications channel even if the random distribution by means of access threshold value would not authorize them to access this telecommunications channel. Thus, by way of example, subscriber stations for emergency services, such as the police or the fire brigade, can be associated with such a prescribed user class and can then access the telecommunications channel with priority irrespective of the random distribution by corresponding access threshold value information."
>
> 26. This ability to allow access irrespective of access threshold value is a theme which appears elsewhere in the specification. At this stage, as I touched on at [205] in my judgment on the parent patent, it would not be entirely clear whether the method of restricting access based on the lottery, on the one hand, and the method of granting access based on prescribed class on the other hand, were to be combined, and if so, how this was to be done.
>
> 27. The specification then goes on, in a rather unhelpful passage, to set out as advantages a number of combinations of features. These combinations of features can be correlated to paragraphs in and claims of the application for the parent patent and the parent patent itself. Rather than deleting these paragraphs, the draftsman has indicated in each case that the advantages are "not claimed in the claims".”

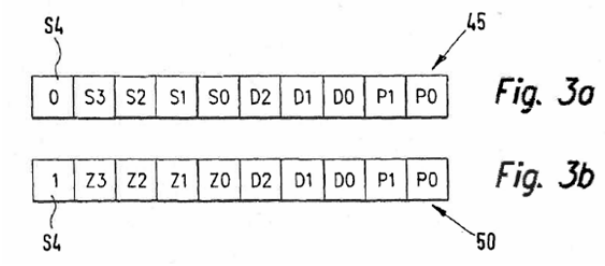
32. From paragraph [0016] onwards the patent describes exemplary embodiments. Floyd J described the structure of this part of the patent as follows:

> 28. *[…]* Broadly speaking, this section divides up as follows:
>
> > i) a first fairly general section from [0016] to [0024] describing how a network can be set up with classes of mobile stations; it also describes how the network accommodates different services, such as large data packets, small data packets and voice transmissions, which can be granted to the mobiles in any combination;
> >
> > ii) secondly, from [0025] to [0033] a description of a first embodiment of the invention utilising 10-bit transmissions;
> >
> > iii) thirdly, from [0034] onwards, a description of a second embodiment utilising 13 bit transmissions;
> >
> > iv) fourthly, at [0037], a description of a flow diagram showing how the mobile can receive and process the 10 and 13 bit transmissions.

33. Floyd J then addressed the first fairly general section and the first embodiment as follows:

> 29. In the first section, at [0021], the specification moves on to explain that it is possible to restrict access to the random access channel by the individual mobile stations by, for example, only allowing particular user classes access on a temporary or permanent basis. At [0022] it is explained that the network operator uses information signals transmitted from the base station to inform the mobile stations of which rights have been assigned to them. The information is sent on a broadcast channel so that the same information is sent to all mobile stations at the same time in order to notify the mobile stations of their assigned access rights to the random access channel.
>
> 30. The specification also explains at [0024] that a random scatter for the access authorisation to the random access channel can be achieved by sending an access threshold value on the broadcast channel. What follows is a description of the approach to granting access rights to a random access channel which I have referred to as "the lottery".
>
> 31. The specification explains that the mobile stations may also be classified into priority classes. As explained at [0026], these priority classes may provide an additional hurdle to access in addition to the lottery.
>
> 32. In the second section, the specification then goes on to describe the first embodiment with reference to figures 3a and 3b. This is the embodiment I described as the "10 bit

embodiment" in my judgment in the parent action. Those figures look like this:



33. These figures represent alternative bit patterns which are transmitted by the network to the mobile stations on a broadcast channel. The first bit in each pattern is an evaluation bit S4. In figure 3a, S4 is 0 and will be used when the network desires to control access by lottery. In figure 3b, S4 is 1 and will be used when it is desired to control access by a class method. When S4 is 0, the following four bits, S3, S2, S1, and S0, are access threshold values. These four bits can be used to transmit 16 different access threshold values to the mobile stations (16 is the number of options that four binary bits gives you). Of course, the same access threshold value will be sent to all the mobile stations. The access threshold value can be set to a greater or lesser value so as to throttle back access to the network.

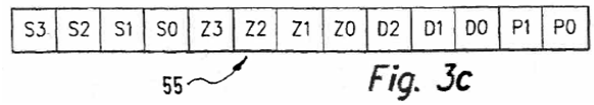
34. In figure 3b the evaluation bit S4 is set to 1. In this case the second, third, fourth and fifth bits are not defined as access threshold value bits but rather as access class bits. So this pattern will be used when it is desired to control access by means of access classes. Each of the access class bits Z3, Z2, Z1 and Z0 represents a particular user class. The arrangement is such that if the access class bit has a value zero, then all the mobile stations in the associated user class can access the random access channel. If the access class bit is set to 1, then none of the mobile stations in that user class can access the channel.

35. At the end of paragraph [0033], the specification explains in summary that the S4 bit determines whether the second to fifth bits are interpreted in line with the first bit pattern (figure 3a) or in line with the second bit pattern (figure 3b). It would accordingly be understood that when the specification spoke earlier about granting access irrespective of access threshold value, it could be referring to sending the figure 3b bit pattern, that is to say simply basing access on access class, when there are no received access threshold value bits."

34. It will be seen that the first embodiment involves using two bit patterns which are each ten bits in length. The first bit (S4) is an evaluation bit. It determines which

form the bit pattern is taking. If S4 is 0 then the bit pattern is in the form of fig 3a while if S4 is 1 the pattern is in the form of fig 3b. Although the two forms are very similar patterns, they are not the same. In the fig 3a form, bits S3, S2, S1 and S0 work together to make a four bit binary number from 0 to 15 which represents a threshold value whereas in the fig 3b form the four bits in the corresponding location, now labelled Z3, Z2, Z1 and Z0, each represent a flag relating to a particular user class.

35. A particular focus of the case is the second embodiment. The second embodiment is described by Floyd J in paragraphs 36 to 40:

> "36. The description of the second embodiment begins at [0034]. I called this "the 13 bit embodiment" in my earlier judgment. The specification says that this embodiment is "based on the invention defined in the claims". It describes this as follows:
>
> > "…in figure 3c, a third bit pattern … having a bit length of 13 bits is transmitted from the base station … to the mobile stations … with the information signals. The third bit pattern … does not have an evaluation bit S4 and therefore comprises both the access threshold value bits S3, S2, S1, S0 and the access class bits Z3, Z2, Z1, Z0. In addition the third bit pattern … like the first bit pattern … and the second bit pattern … comprise the telecommunications service bits D2, D1, D0 and the priority bits P1, P0."
>
> 37. Figure 3c looks like this:
>
> 
>
> Fig. 3c
>
> 38. I have described what the priority bits (P1, P0) do above. The telecommunications service bits (D2, D1, D0) are bits which define whether particular services, such as data or voice can be used. [0034] continues:
>
> > "Mobile stations belonging to a user class for which the associated access class bit = 0 are able to access the RACH … irrespective of the access threshold value S and of the priority threshold value P, and hence possibly without evaluation thereof in the evaluation unit… Mobile stations belonging to a user class whose associated access class bit has been set to 1, and mobile stations which do not belong to a user class, must perform the access threshold value evaluation already described in the first exemplary embodiment, and where applicable, in addition, the priority threshold value evaluation described in the first exemplary embodiment,

> in order to ascertain their access authorization for the RACH."

39. The skilled person would appreciate that what is envisaged is a system in which both access threshold value and user class information are sent to the mobile stations. The setting of the user class bit for any given class determines whether that class is able to access the RACH without doing the lottery, or whether instead it must be subjected to the lottery. Which it does can be altered by the network by setting the bit. Paragraph [0034] concludes:

> "In contrast to the first exemplary embodiment, it is, in the case of the second exemplary embodiment, possible that, alongside mobile stations permitted to access the RACH … due to their association with a user class, access to the RACH … is granted also to those mobile stations which draw a random or pseudo-random number R [of] greater than or equal to the access threshold value S and where applicable have a priority value above the priority threshold value P."

40. This passage is explaining that, in this embodiment, there are mobiles which will be permitted to access the RACH due to their user class, as well as mobiles which will be able to access the RACH only if they "win" the lottery. The skilled person would therefore appreciate by this stage that, in this embodiment of the invention, the network can discriminate between groups of users, for example ensuring that the emergency services are permitted access without having to do the lottery. He (or she) would also appreciate that at the same time the network can control the unfavoured users' access to the RACH by means of the lottery, by appropriate setting of the access threshold value. It would be clear that this functionality is additional to that provided by the first embodiment.

36. IPCom describes what Floyd J deals with in paragraph 40 as the system providing horizontal and vertical control. This was mentioned by Kitchin LJ in the Court of Appeal in paragraphs 36 to 38 which I will also refer to:

> “36. The two routes of access feature provides what Mr Purvis described as horizontal and vertical control. The network provider can adjust the set of classes that do not have to win the lottery (horizontal control) and can separately adjust the access threshold value to make it harder or easier to win the lottery (vertical control). The judge put it this way at [40]:
>
> […]
>
> 37. He described it in similar terms at [55] when considering the invention claimed in the patent:

> "Mr Gould [IPCom's expert] summarises the invention as providing, in a bandwidth efficient manner, a means for the network dynamically to adjust specific groups of users into a population with a priority access to the network independent of access threshold while at the same time using that access threshold to dynamically control the access of other users. He explains that it is bandwidth efficient by saying that it is possible only to send a single access threshold value, although of course the claim is not so limited. Again, I think this summary is a fair one to have in mind when considering the issues in the case, although it is not, of course, a substitute for the claims."
>
> 38. There is a further aspect of the description I would mention at this stage, namely the significance of the D bits and the P bits. I think it is clear that their relationship to the 13 bit embodiment is the same as it is to the 10 bit embodiment. The two routes of access feature does not depend in any way upon the D bits or the P bits for its functionality."

37. Bearing in mind the issues I have to decide, I will add only the following. One of the ways in which the second embodiment (the 13 bit embodiment) differs from the first embodiment (the 10 bit embodiment) is that now there is a single bit pattern which carries all the relevant information. Both kinds of information (access class control and threshold values) are available at the same time in the second embodiment. That is what allows for the horizontal and vertical control.

38. Focussing on bit patterns, the reader would understand that the two bit patterns fig 3a or fig 3b in the first embodiment are alternatives. Thus both embodiments involve the network sending only one bit pattern at any given moment and involve only one bit pattern governing the behaviour of the system at any moment. The difference between the two embodiments is that in the second embodiment there is only one bit pattern to be sent whereas in the first embodiment there are two bit patterns, either of which could be sent. One of the added matter objections which was rejected by Floyd J and the Court of Appeal was the argument that because the flowchart processes all three bit patterns, the disclosure was limited to a system which had to be able to send (and receive) all three kinds of bit pattern. That was rejected (see Court of Appeal judgment paragraph 62).

39. The other important difference between the two embodiments is that the meaning of the access class bits has changed. In the first embodiment the relevant access class bit (Z3-Z0 in fig 3b) determines whether a mobile to which it applies can or cannot access the RACH at all. If it can, the mobile does not need to perform the lottery. If it cannot, the mobile cannot access the RACH at all (subject to the other signals). In the second embodiment the corresponding access class bit determines whether the relevant mobile either can access the RACH without the lottery or has to perform the lottery to access the RACH. Loosely, in the first embodiment "no" means "no" whereas in the second embodiment, "no" means "maybe".

40. In the specification, just before the section dealing with the flowchart, there is paragraph [0036]. It was of some importance before Floyd J regarding added matter (Floyd J paragraph 41) and is of some importance before me. The paragraph reads:

> "The numbers of bits used in the first, second and third bit patterns … for the access threshold value S, the access class information Z0, Z1, Z2, Z3, the priority threshold value P and the subscriber service information D0, D1, D2 are to be understood merely by way of example and can be increased, for example for more extensive signalling (*sic*), and can be reduced for bandwidth reduction. In this case, the total length of the bit patterns 45, 50, 55 also change, where applicable. Where applicable, individual elements of the information components can also be omitted entirely."

41. I will need to consider what the skilled person would make of this below.

42. Finally I should refer to the flow chart and some other matters. Floyd J mentioned the flow chart in figure 4 at paragraph 42. As he said the description of the flow chart starts at paragraph [0037]. It addresses the processing of the access threshold value and the class tests. It also deals with other points of less significance to this case (priority threshold value, user services and privileged user class tests). Paragraph [0038] completes the disclosure relating to the flow chart. The penultimate paragraph ([0039]) is generalised and not relevant. Paragraph [0040] relates to a detailed alternative concerning the test of the random number R against the access threshold S. Nothing turns on it.

The language of the specification and the claims

43. Subject to one point arising from the amendment which I will address separately, there was no debate about translations. Nevertheless since the patentee is applying to amend, it is necessary to be clear about exactly what state the patent in suit is currently in.

44. The patent was published on 17th March 2010 in the German language. In the past, pursuant to s77(6) of the Patents Act 1977, a European patent (UK) published in German did not take effect in the UK under s77(1) until an English translation was filed at the UKIPO. However that sub-section ceased to have effect from 1st May 2008 when the London Agreement came into force. An English translation was not filed at the UKIPO for this patent but given the dates, there was no need to do so in order to bring the patent into effect.

45. The previous English proceedings worked from an ad-hoc English translation of the specification, and I have been invited to do the same. Its accuracy has not been challenged, and I will work from it. Nevertheless, it bears noting that under s80 the authentic text of a German (or French) language European patent is that language for the purposes of domestic proceedings. This is the effect of s80(1), subject to s80(2). Section 80(2) provides that an English translation of the specification filed under s77 shall be treated as the authentic text in domestic proceedings other than for the purposes of revocation. However query whether the English translation in this case is to be regarded as one filed under s77 at all since it was not needed to bring the patent

into effect. Moreover query what the effect was of the amendment allowed by Floyd J, which was, after all, in English.

46. IPCom submitted that today the position is that the patent (i.e. the EP (UK)) has a specification in German and a claim as amended in the previous action. So the claim in force in the UK today is not a translation, it is a claim in the English language. HTC did not dissent from this and I accept IPCom's submission. If I allow the amendment sought now, it will take effect as an English language patent claim with a German specification, as before. The English translation of the specification on the register is useful but I do not believe it is the authentic text of the specification for any purpose.

Construction – the law

47. Both sides agreed that the essential legal principles relating to construction of patents are to be derived first from the House of Lords in ***Kirin-Amgen Inc v Hoechst Marion Roussel*** [2004] UKHL 46. Points which bear emphasis are that the exercise is one of *purposive* construction and one is always concerned with "what the person skilled in the art would have understood the patentee to be using the language of the claim to mean" (per Lord Hoffmann, paragraph 34 of ***Kirin Amgen***).

48. Both sides also agree that next I should have in mind the summary of the relevant principles by Jacob LJ in the Court of Appeal in ***Virgin Atlantic Airways Ltd v Premium Aircraft Interiors UK Ltd*** [2009] EWCA Civ 1062:

> "5. One might have thought there was nothing more to say on this topic after *Kirin-Amgen v Hoechst Marion Roussel* [2005] RPC 9. The judge accurately set out the position, save that he used the old language of Art 69 EPC rather than that of the EPC 2000, a Convention now in force. The new language omits *the terms of* from Art. 69. No one suggested the amendment changes the meaning. We set out what the judge said, but using the language of the EPC 2000:
>
> > [182] The task for the court is to determine what the person skilled in the art would have understood the patentee to have been using the language of the claim to mean. The principles were summarised by Jacob LJ in *Mayne Pharma v Pharmacia Italia* [2005] EWCA Civ 137 and refined by Pumfrey J in *Halliburton v Smith International* [2005] EWHC 1623 (Pat) following their general approval by the House of Lords in *Kirin-Amgen v Hoechst Marion Roussel* [2005] RPC 9. An abbreviated version of them is as follows:
> >
> > (i) The first overarching principle is that contained in Article 69 of the European Patent Convention;
> >
> > (ii) Article 69 says that the extent of protection is determined by the claims. It goes on to say that the description and drawings shall be used to interpret the claims. In short the claims are to be construed in context.

> (iii) It follows that the claims are to be construed purposively—the inventor's purpose being ascertained from the description and drawings.
>
> (iv) It further follows that the claims must not be construed as if they stood alone—the drawings and description only being used to resolve any ambiguity. Purpose is vital to the construction of claims.
>
> (v) When ascertaining the inventor's purpose, it must be remembered that he may have several purposes depending on the level of generality of his invention. Typically, for instance, an inventor may have one, generally more than one, specific embodiment as well as a generalised concept. But there is no presumption that the patentee necessarily intended the widest possible meaning consistent with his purpose be given to the words that he used: purpose and meaning are different.
>
> (vi) Thus purpose is not the be-all and end-all. One is still at the end of the day concerned with the meaning of the language used. Hence the other extreme of the Protocol—a mere guideline—is also ruled out by Article 69 itself. It is the terms of the claims which delineate the patentee's territory.
>
> (vii) It follows that if the patentee has included what is obviously a deliberate limitation in his claims, it must have a meaning. One cannot disregard obviously intentional elements.
>
> (vii) It also follows that where a patentee has used a word or phrase which, acontextually, might have a particular meaning (narrow or wide) it does not necessarily have that meaning in context.
>
> (vii) It further follows that there is no general "doctrine of equivalents."
>
> (viii) On the other hand purposive construction can lead to the conclusion that a technically trivial or minor difference between an element of a claim and the corresponding element of the alleged infringement nonetheless falls within the meaning of the element when read purposively. This is not because there is a doctrine of equivalents: it is because that is the fair way to read the claim in context.
>
> (ix) Finally purposive construction leads one to eschew the kind of meticulous verbal analysis which lawyers are too often tempted by their training to indulge."

49. HTC also referred to the recent judgment of the Court of Appeal in ***Jarden Consumer Solutions (Europe) Ltd v SEB SA*** [2014] EWCA Civ 1629. They submitted that there the Court of Appeal had overturned a finding of infringement because the judge

had placed too much importance on purpose and not enough on a clear restriction in the claim (see Vos LJ paragraphs 38, 39, 44 and 46).

Use of prosecution history / "file wrapper estoppel"

50. HTC submitted that the prosecution history of a patent is admissible, and may be useful, as an aid to the issue of construction, relying on Arnold J in ***Actavis UK Ltd v Eli Lilly & Company*** [2014] EWHC 1511 (Pat) at paragraphs 108-112, where he reviewed the authorities and decided that in some circumstances the prosecution history could be relied on. Mr Purvis for IPCom informed me that the Court of Appeal were hearing the appeal in ***Actavis v Lilly*** at the very same time as this trial. He did not engage with a detailed debate about the scope of any doctrine about reliance on the prosecution history. His submission was that on the facts of this case the materials which would have to be scrutinised to apply any such doctrine do not produce a clear enough answer to be relied on. As regards the decision of the Board of Appeal which allowed the amendment, Mr Purvis did not contend that the court should ignore it, but he argued that the decision in this case did not contain anything relevant on the points in issue.

Construction – points not in dispute

51. A number of points on construction are not in dispute but are worth mentioning nevertheless. First, the claim is drafted as a claim to a mobile station. Nevertheless much of the claim is concerned with how the network operates. Second, the claim as granted requires a system which uses the access class information relevant to the user class to determine whether the mobile is permitted to access the RACH independently of the lottery or whether access to the RACH by the mobile is determined by the lottery. The amended claim changes the term "access class information" into "access class bit" and that gives rise to a major debate (below) but it is not disputed that the essential function of determining "whether or whether" (as Counsel put it) remains the same. Third, the claim is focussed on how the mobile is permitted access, not how it is refused. That is the question addressed by Floyd J (judgment paragraphs 46-52). Fourth, although there are quite a few proposed amendments to the claim language, none of them alter the meaning of the claim compared to what was considered before save for the two crucial issues relating to "as a bit pattern" and "access class bit".

Construction and infringement – the issues:

52. Counsel for IPCom submitted that this was a case in which it was legitimate to consider the disputes on construction and infringement together. I agree that the best way to understand the arguments on construction is with an eye on the infringement issues and so I will start with an explanation of how the UMTS system works. Apart from anything else the various arguments interact with each other to such an extent that it is the most practical way forward. One simply has to start somewhere.

53. Floyd J described how UMTS devices worked in paragraphs 178 – 187. The devices were referred to as A1. Although before the judge the devices were from Nokia whereas this case is about HTC, there is no relevant difference since both work in accordance with the UMTS standard and it is convenient to refer to Floyd J's description:

"178. The *[…]* device described as A1 operates as follows. The mobile is designed to receive two parameters of relevance. These are the dynamic persistence level, N, and the AC to ASC mapping information. I explain these in some more detail below.

179. Any device operating in accordance with the A1 method must be a member of at least one Access Class (AC). There are 10 normal ACs, numbered from 0-9. Every device must be a member of one of those normal ACs and the number of the particular AC to which the device belongs is stored on its SIM card. There are another 5 special Access Classes (11-15) designated for use by special groups of users such as emergency services and network staff. All access classes may be barred at any time by the network.

180. The next thing which it is necessary to understand is how the A1 selects an Access *Service* Class ("ASC") which it will use for its access attempt. These ASCs are different from the AC stored on the SIM. As I have said, the transmitted data includes an element entitled "AC-to-ASC mapping". This allocates each AC to an ASC. There are 8 ASCs numbered from 0-7. The mapping is carried out by the device reading the information element (IE) in the System Information Block appropriate to its AC. The way this is done is set out in Table 2 taken from the A1 Product and Process Description. ACs 0-9 look at the first IE in the block, 10 the second, 11 the third and so on.

AC	0 - 9	10	11	12	13	14	15
ASC	1st IE	2nd IE	3rd IE	4th IE	5th IE	6th IE	7th IE

Table 2: mapping of Access Classes to Access Service Classes

181. Depending on which ASC has been allocated by the mapping process, the device works out a "persistence value" known as P(i), (not the same as the dynamic persistence level, N, sent by the network). The way this is done is set out in Table 1 taken from the A1 Product and Process Description:

ASC # *i*	0	1	2	3	4	5	6	7
P_i	1	P(N)	s_2 P(N)	s_3 P(N)	s_4 P(N)	s_5 P(N)	s_6P(N)	s_7 P(N)

Table 1: derivation of persistence levels P_i

182. It can be seen that there is a difference between ASC 0 and the other ASCs. If a device is in ASC 0 the device automatically sets its persistence value, P(i), to 1. This conclusion is arrived at directly from the AC to ASC mapping and not from the other parameter of importance, the dynamic persistence level, N.

> 183. On the other hand, if a device is in one of the other ASCs (1-7), it has to carry out a calculation using the dynamic persistence level, N, sent by the network. The formula to derive P(i) in such a case involves P(N) where
>
> $$P(N) = 2^{-(N-1)}$$
>
> 184. So P(N) is a function of (i.e. mathematically dependent on) the transmitted dynamic persistence level.
>
> 185. If the network wishes to distinguish between ASCs 1-7 it can optionally broadcast a scaling factor which may be different for each ASC. Each device is programmed to apply the scaling factor appropriate to its ASC when calculating the P(i). That is why the boxes in Table 1 above include the scaling factors s.
>
> 186. P(i) is used by the device to determine whether or not it can start transmitting over the RACH. It does so by a persistency test. The persistency test involves the device randomly generating a number R. Armed with R and P(i), the device then compares the two. If R is less than or equal to P(i), the device is permitted to transmit on the RACH. If R is greater than P(i), transmission on the RACH is not permitted in that time interval and the device must wait until the next transmission time interval designated by the network. In other words the device operates a lottery.
>
> 187. Devices which are mapped to ASC 0 by the network will automatically pass the persistence test because the random number can never exceed 1. Those devices which are mapped to ASC 1 or higher may or may not pass the persistence test. Whether they pass the persistence test depends on the value N sent by the network."

54. This system was found to infringe the claim in its original form on the following basis (taken from Floyd J paragraph 188):

i) the bits used in UMTS to transmit the dynamic persistence level, N, constitute the access threshold value bits;

ii) the AC to ASC mapping information in UMTS constitutes access class information;

iii) P(N) is an access threshold value which is determined from the access threshold value bits;

iv) The AC to ASC mapping information is used to determine whether the device is in:

a) ASC 0, in which case it is permitted to access the RACH independent of the received access threshold value bits because it has a P(i) value of 1 which is not a function of the persistence level N which is being broadcast by the network; or

b) an ASC other than 0 in which case it must determine access permission on the basis of an evaluation of P(N) which comprises a comparison of P(N) with a randomly generated number.

55. Certain aspects of the UMTS system which Floyd J did not need to consider now have some importance. Two pieces of information sent by the network to the mobile are the dynamic persistence level N (held to be access threshold value bits as claimed) and the AC-ASC mapping information (held to be access class information as claimed). Details which matter now and did not matter before are the manner in which these two pieces of information are sent by the network to the mobile and the nature of the AC-ASC mapping information itself.

56. The manner in which the information is sent is as follows. The data passes to the mobile over a logical channel known as the Broadcast Control Channel (BCCH). The information sent on the BCCH is arranged in blocks. There are Master Information Blocks (MIBs) and System Information Blocks (SIBs). While there is only one kind of MIB, there are a number of different SIBs (SIB 1, SIB 2 etc.). The MIB tells the mobile what the schedule of SIBs on the BCCH will be. Each SIB contains a mixture of mandatory and optional information. The dynamic persistence level N is in SIB 7 whereas the AC-ASC mapping information is in SIB 5. These SIBs need not be sent at the same rate or on the same schedule. The network operator is free to set the rate and schedule (within limits). The data defined to be in SIB 7 is data which might change frequently and so one might expect SIB 7 to be sent more often than SIB 5. Perhaps some network operators do that but figures published in the Qualcomm paper (On Standby Battery Life of Mobile Devices in UMTS Networks by Catovic et al) show that on the three networks tested there, SIB 5 and SIB 7 were being sent at the same rate.

57. HTC submit that this means the claim is not infringed because the information is not sent “as a bit pattern”. They argue that a bit pattern is a sequence of contiguous bits and that the way in which the data are sent in UMTS does not involve a bit pattern at all. At best, while the claim refers to a single bit pattern, one could say that the UMTS system uses two bit patterns (SIB 5 and SIB 7). So there is no infringement. Further, if the language arguably covers more than one bit pattern, then it lacks clarity and the amendment should be refused. If the claim does cover more than one bit pattern then that amounts to added matter because the claim is supposed to be based on the second embodiment in the patent, a key aspect of which is that only a single bit pattern was used to send the information.

58. IPCom does not accept this. It does not accept that a “bit pattern” has to be contiguous, and it does not accept that the claim means a single bit pattern nor that UMTS can be regarded as using two bit patterns. It says that the data in UMTS is indeed sent as a pattern of bits (i.e. a bit pattern). Even if UMTS is correctly characterised as using two bit patterns, IPCom contends there is still infringement. In any event there is no lack of clarity and no added matter.

59. The other issue relates to AC-ASC mapping information. Since there are eight possible ASCs (quoted paragraph 181 above), the relevant information element is a three bit binary number. To be permitted to bypass the lottery the mobile must be placed into ASC 0, which requires all three bits to be zero. Thus UMTS uses three bits while, HTC contends, the amended claim calls for a single access class bit and so there is no infringement. IPCom has a number of arguments to the contrary. It argues that a single bit is determinative at least sometimes and also that the claim should not be construed in such a restrictive fashion.

"as a bit pattern"

60. HTC submitted, supported by Mr Simmons, that "bit pattern" was a technical term. If so then evidence is admissible as to its meaning. IPCom submitted that the expression was not a term of art, supported by Dr Irvine. If not then evidence is not admissible as to its meaning.

61. When Dr Irvine expressed the view that "bit pattern" was not a term of art what he had in mind was that "bit pattern" is not a term with a meaning which had been defined formally for example in a standard. Many telecommunications standards do define terms in a precise way and "bit pattern" is not one of those. However the fact it has not been formally defined may be relevant but is not determinative of the question of whether it has a technical meaning.

62. Dr Irvine expressed the view that "bit pattern" was not very specific. Mr Simmons was asked in cross-examination to account for the fact that Dr Irvine did not understand the term in the same way that he did. Mr Simmons' reply was that the actual definition will vary depending perhaps on the experience of an engineer and the field in which they work.

63. IPCom submitted that since "bit pattern" did not have a well defined specific meaning, it could not be a term of art, referring to paragraph 333 of the judgment of Arnold J in ***Medimmune*** [2011] EWHC 1669 (Pat). There the judge held that a word was not a term of art with a clear meaning, rather it was a term which, in the absence of a specific context making it clear what was meant, could be understood by skilled people in different ways. I do not accept the submission of principle that just because there is an argument about what the term means, it necessarily is not a term of art as to which evidence is admissible. Nor do I believe was Arnold J saying anything different.

64. Overall, I preferred Mr Simmons' evidence on the question of whether bit pattern is a technical term recognised by those working in the field relevant to this patent. I find that it is a term of art in the sense that evidence is admissible as to its meaning. The evidence may show that its meaning is different in different technical contexts but that does not mean it is not a term of art.

65. Dr Irvine's view was that "bit pattern" just meant a pattern of bits and did not have any more specific meaning. Mr Simmons did not agree. His view summarised in his main report (para 8.27) was that a bit pattern is a sequence of contiguous bits where significance is carried by the position and value of the bits. Mr Simmons produced copies of the definitions he had found in technical dictionaries. They were all the ones he found. A notable aspect is the contrast between a "bit pattern" and a "bit

string". The former has a predetermined length whereas the latter does not. The dictionary definitions are:

> *bit pattern*
>
> "A specific layout of binary digits. See bitmap"
>
> "A combination of binary digits arranged in a sequence"
>
> "A sequence of bits, in a memory a communications channel or some other device. The term is used to contrast this with some higher level interpretation such as an integer or image. A bit string is similar but suggests an arbitrary, as opposed to predetermined length."
>
> *bit string*
>
> "A set of consecutive binary digits representing data in coded form, in which the significance of each bit is determined by its position in the sequence and its relation to other bits."
>
> "An ordered sequence of bits. This is very similar to a bit pattern except that the term 'string' suggests an arbitrary length sequence as opposed to a pre-determined length 'pattern'"

66. The definitions provide support for Mr Simmons' definition. A particular focus of the debate before me was about Mr Simmons' requirement for contiguity. The word "contiguous" is not used in the definitions although the sense of their references to a sequence with a given length is along the same lines. I will return to that below.

67. IPCom did not put any rival definitions to Mr Simmons. What was put in cross-examination was an extract from the GSM standard (GSM 08.61, pr ETS 300 598, August 1995), in support of the point that a bit pattern need not be contiguous. The extract was from a section dealing with frame synchronisation (section 6.8 of the extract). There are patterns used to achieve frame synchronisation. In the pattern at 6.8.1.1 the first eight bits are defined and then the first bit in each alternating subsequent 8 bit octet is also defined. So the defined bits are not contiguous. The text at 6.8.1.1 refers to a "35 bit alignment pattern". There are 35 defined bits in the overall group of 320 bits (8x5 octets). There is another similar pattern at 6.8.2.1. That pattern has 28 defined bits out of a group of 160 bits (4x5 octets). Paragraph 6.8.2.1 refers to a "28 bit pattern". Mr Simmons did not accept that this was referring to a bit pattern in the sense in which he was addressing the term. I agree. The fact that the words bit and pattern appear together in 6.8.2.1 is only because the word "alignment" has been missed out because it is obvious from the context. These are alignment patterns. The word bit is being used with the number to refer to the number of bits in the alignment pattern. In my judgment this part of the GSM standard does not help. It is the only concrete counter example advanced by IPCom.

68. There is a distinction between a bit pattern and a key value pair, as Dr Irvine accepted in cross-examination. He explained that the contrast is that in a bit pattern it is the position of the bits which define their meaning whereas in a key value pair the key

sent with the value defines the meaning of the value. He also accepted that when data are transmitted, a regime with bit patterns increases the efficiency of transmission because you do not need to send an identifier for each value. In effect when a bit pattern format is used the identifiers must have been agreed in advance.

69. In my judgment the term bit pattern would be a familiar one to the skilled addressee. It did not have a formal definition but the skilled addressee would know what it meant. To the skilled addressee and in the technical context of this patent, a bit pattern is a format. It consists of a sequence of bits of a predetermined length where significance is carried by the position and value of the bits. A contra-distinction would be with a bit string, which is of arbitrary length. The skilled addressee would not focus on contiguity itself as a distinct attribute of bit patterns. Rather contiguity is something which emerges from the fact that a bit pattern is a sequence of predefined length.

Bit pattern in the patent

70. Turning to the patent specification, the usage there is conventional and would be seen as such by the skilled addressee. Figure 3a is properly referred to in the specification as a bit pattern not merely because it is some bits which happen to be arranged together in a pattern, but because it has a predefined length and the position of a given bit in the pattern defines the meaning of that bit.

71. A key aspect of the second exemplary embodiment is emphasised in the specification in the last sentence of paragraph [0034] (the sentence starting "In contrast to the first exemplary embodiment ...") and on into paragraph [0035]. The second embodiment allows access to the RACH to be controlled by reference to user class alongside access controlled by the threshold value (i.e. the lottery) and that is achieved because the third bit pattern (i.e. fig 3c) contains both access threshold value bits and access class bits.

Bit pattern in the claim

72. Before I address the particular issue, I need to deal with three overarching points. First IPCom submitted that one needed to take care about approaching the claim with underlining and striking through because it had a tendency to draw undue focus on elements of the claim which the skilled addressee would not necessarily regard as important. Since I can see there may be something in IPCom's point and even though the claim has been set out above already, I will start the consideration of the disputed aspects of claim construction by setting out the claim again, this time in a clean form and divided into convenient integers:

A	Mobile station (5, 10, 15, 20) for operation in a UMTS mobile radio network
B	in which multiple user classes (35, 40) are distinguished,
C	in which information signals with access authorization data are transmitted to the mobile station, wherein the access authorization data are transmitted as a bit pattern,
characterised in that the mobile station (5, 10, 15, 20) is arranged:	
D	to read a user class (35, 40) from a SIM card (75),
E	to receive the access authorization data, which have access threshold

	value bits (S3, S2, S1, S0) and access class bits (Z0, Z1, Z2, Z3) over a broadcast control channel (25),
F	to determine an access threshold value (s) from the access threshold value bits (S3, S2, S1, S0), if the access authorization for the random access channel is determined on the basis of an access threshold value evaluation,
G	by means of the access class bit (Z0, Z1, Z2, Z3) relevant for the user class (35, 40) to determine whether
H	the mobile station (5, 10, 15, 20) is permitted to access a random access channel, for example RACH, independent of the received access threshold value bits (S3, S2, S1 , S0),
I	or whether the access authorization for the random access channel, for example RACH, is to be determined on the basis of an evaluation of the access threshold value,
J	and is arranged to compare the access threshold value (S) with a random number or pseudo random number (R) as the access threshold value evaluation,
K	and is arranged to access the random access channel dependent on the determination, using the access class bit either independent of the received access threshold value bits (S3. S2, S1, S0) or dependent on the result of the comparison.

73. Second there is a dispute about the correct definition and significance of the inventive concept. In closing IPCom submitted:

> "14. We submit that the contextual meaning can be deduced as a matter of purposive construction. The purpose of the *'bit pattern'* in the claim is simply to provide the relevant information from the network to the mobile stations in the form of bits in recognisable positions so that the mobile stations can perform the process described in the claim. The Patent is not concerned with how the information necessary to enable the mobile station to recognise the significance of the positions is provided. In practice, however, it is obvious that this information will be provided in part by the Standard and in part by information sent out by the network. See Simmons XX 2/235 lines 10-23."

74. HTC submitted that while it is correct that when the patent was considered before Floyd J and the Court of Appeal on the previous occasions, the disclosure and the inventive concept underlying it all was identified at a level of generality which was not concerned with how information was provided to the mobile, it does not follow that that is correct now in the light of the amended claim. HTC are right at least to this extent. I should not assume that general statements about what the patent provides made in the previous case are applicable in unmodified form now.

75. In its form above and unlike the position in the previous English case, the claim includes an express reference to the manner in which the access authorization data are to be transmitted (as a bit pattern, feature C) and there are also express references to

the kind of information which the mobile uses in making its determination what to do (features G and K refer to using the relevant access class bit).

76. The cross-examination of Mr Simmons which IPCom cites in the paragraph quoted above does not support the proposition it is cited for. The question was concerned with how the mobile is supposed to know that it is receiving one of the bit patterns referred to in the specification and Mr Simmons' answer was that there clearly had to be some information to allow the mobile to recognise that, but the patent was not concerned with that. Plainly the patent contemplates that the mobile and the network have to understand each other and the patent is not concerned with how, in the second embodiment, the mobile identifies that a particular collection of data is the bit pattern fig 3c. No doubt it could be based on the standard (which had not yet been fixed) or be done by network signalling. I accept that the patent takes for granted that the mobile will have to identify the bit pattern by some unspecified means. However that is different from saying that the patent is not concerned about how the knowledge necessary to parse a given collection of bits is sent. It is also different from saying more broadly that the patent is not concerned with how the access authorisation data are sent.

77. The specification contains a clear disclosure concerned with how the access authorisation data are sent. Although paragraph [0010] is written in general terms and refers to information generally rather than to bit patterns, feature C of the claim states in terms that the access authorisation data is transmitted as a bit pattern. This draws the reader's attention to passages in the specification about bit patterns. Those passages are in the embodiments. The embodiments are exemplary in nature but they contain the only disclosure which mentions sending data in a bit pattern format.

78. General paragraph [0009] draws attention to the aim of using a minimum transmission capacity. Bandwidth efficient transmission is also referred to in the passage from Mr Gould's evidence in the previous case which was quoted by both Floyd J (paragraph 55) and the Court of Appeal (paragraph 37) and which I have cited again above. Using a bit pattern format as opposed to other methods of sending data such as a key value pair is something the skilled addressee reading the specification would understand as contributing to the achievement of that aim. It contributes to the achievement of that aim because information about how to parse a given bit pattern is agreed in advance and does not take up transmission capacity.

79. Paragraph [0035] is significant, particularly following the last sentence of paragraph [0034]. The paragraph draws particular attention to a comparison relating to bit patterns between the first embodiment and the second embodiment. One bit pattern is used in the second embodiment to send both the threshold value bits and the access class bits, unlike the first embodiment.

80. Finally at this stage I should mention that I accept HTC's point that Dr Irvine's formulation of the inventive concept was framed with one eye on the UMTS system and as such is not useful.

81. I will return to the inventive concept below.

82. The third overarching point is the following. I am not satisfied that the less conventional sources mentioned by the parties help enough to be worth relying on.

By less conventional sources I mean the EPO proceedings and what happened in other courts:

i) I am not satisfied that what happened at the EPO in this case is sufficiently clear cut that it is useful to take it into account in resolving the issues of construction. For the purposes of the amendment below I will delve into events at the EPO.

ii) The Board of Appeal decision itself does not address the particular issues of construction either (at least not in a manner which helps here). The last two paragraphs of section 4.2 could be read in a manner consistent with HTC's case but it is not so clear that I am prepared to place weight on it. I note that the Board seem to have regarded "bit pattern" as a term of art (section 4.4) but I have resolved that based on the evidence and cross-examination before me, which the EPO did not hear.

iii) Nor am I satisfied that consideration of the parallel decisions in Italy and Germany is helpful either. A summary addressed to those decisions is in Annex 2.

83. Now, finally, I can turn to the claim. Feature C requires that "the access authorization data are transmitted as a bit pattern". The term "access authorization data" presents no difficulty. The access authorization data referred to are the access threshold value bits together with the access class bits. They have to be transmitted as a bit pattern. The skilled addressee would regard this as conventional usage of the term "bit pattern". The data has to be sent in a format consisting of a sequence of bits of a predetermined length where significance is carried by the position and value of the bits.

84. Would the fact that feature C is in the pre-characterising portion of the claim lead a skilled addressee to think that the feature was unimportant? IPCom submitted it would be understood simply as part of the context in which the mobile was operating. The bit pattern format is not itself a new idea and that may well be why it is mentioned in the pre-characterising portion. But many inventions are new combinations of old and new ideas together whereby all the elements matter in combination. In any case the fact that the bit pattern format contributes to transmission efficiency would be understood by the skilled addressee to indicate that this feature mattered. It is not merely a feature referring to the context in which the mobile is operating.

85. As a matter of language the claim clearly covers the case in which both pieces of information (access threshold value bits together with the access class bits) are found in the same bit pattern. After all that is the second exemplary embodiment which the claim is plainly based on. One aspect of the infringement case is to ask whether the claim also covers a case in which the two pieces of information are found in distinct bit patterns.

86. In his report Dr Irvine suggested that the reference to bit pattern in the claim would be understood simply as an indication that the claim required digital transmission rather than analogue. I do not agree. Given the reference in the claim to UMTS (which although it had not been finalised, was plainly going to be a digital system) as well as

the other references to bits, no skilled addressee would think that the inventor had used the words bit pattern to mean that.

87. IPCom referred to an item of prior art cited in the EPO proceedings which involved a combination of digital and analogue signalling. I was not shown it and there was no suggestion that it was common general knowledge. It is not relevant to claim construction.

88. The core idea in the claimed invention is about a method of controlling access to the RACH but in my judgment, given the language used in the claim, the skilled addressee would understand that one of the issues with which the claimed invention is concerned is how the access authorisation data are transmitted. That is a difference from the case considered in England before and could be called a difference in the inventive concept. With the claim I have to consider, the skilled addressee would attribute significance to the reference to a bit pattern. It is a requirement related to the manner in which the access authorisation data is to be transmitted. This makes sense given the concern about transmission efficiency. The efficiency arises from the fact that information needed to parse a collection of bits forming a bit pattern does not need to be transmitted. It is true that there are no paragraphs in the specification which discuss the reason why a bit pattern is efficient, but that is because the understanding is part of the skilled addressee's common general knowledge.

Infringement

89. I can dispose of one point readily. HTC detected that IPCom's infringement case was that the mobiles infringed simply because all the data is sent as a repeating stream of bits on the UMTS broadcast control channel (i.e. the logical channel called the BCCH). In effect the bit pattern is the BCCH. This did indeed seem to be Dr Irvine's opinion as expressed in his reports. For example his reports make no mention of SIBs and the last sentence of paragraph 123, which addresses infringement of feature C states: "Information broadcast on the BCCH is arranged in the form of a bit pattern, i.e. digitally in a logical structure that enables the mobile to correctly identify the transmitted information."

90. If that is indeed IPCom's case then I reject it. It takes no account of the language of the claim. The skilled addressee would see that the claim contemplates that the data will be received over a broadcast control channel (feature E). They would know that such channels will consist of a stream of bits in a logical structure. The information will be broadcast repeatedly. That is not what the skilled addressee would understand the claim to have meant by transmitting the access authorisation data as a bit pattern. After all in the patent the first embodiment has two bit patterns which would make no sense if the broadcast control channel itself was a bit pattern.

91. IPCom submitted that one can plainly see a "pattern of SIBs" being sent by the network. I agree. Also IPCom submitted, and I accept, that within the SIBs, the individual bits comprising the access authorisation data are contained in particular information elements at positions laid down by the Standards so that the mobile can identify them. The Standards characterise some information elements in the SIBs as mandatory and some as optional. The two information elements relevant to this case are mandatory, however the optional information elements mean that there is a degree of choice for each network about the use of others and this can affect the position of

the information elements which are included. The network sends information in the header part of the SIB to inform the mobile which optional elements have been used. As Mr Simmons agreed, the network must have an algorithm which will determine the position of each bit on the BCCH and the bits are going to appear in the same places on the BCCH repeatedly every 128 frames, over time.

92. IPCom submitted in closing that:

> "… we established that it is both permitted and realistic within UMTS for the network to send all the system information data bits including the AC to ASC mapping data and the threshold values at fixed, predetermined positions on the BCCH, repeatedly every 128 frames. We submit that this plainly satisfies the requirement of a 'bit pattern' using any sensible definition of the term and the entire purpose of sending a bit pattern. The only definition which this could not satisfy is one which required strict 'contiguity' of all the access authorisation data, since UMTS requires a gap between the AC to ASC mapping data and the threshold values (although SIB5 and SIB7 can be concatenated, as shown for example by the network in fig 5 of X3, there will always be some bits between the two information elements). But, as we have said, this construction is simply untenable either as a matter of language or of purpose."
>
> (paragraph 22)

93. Attractively put though it is, in my judgment this is in truth the infringement argument I have addressed above. It is the argument that because the bit stream on the BCCH repeats every 128 frames, the relevant data are sent as a bit pattern. I have already rejected that. The only problem which is acknowledged is that the two fields required by the claim (threshold value bits and the access class bits) are separated by many other things and so are not contiguous. The point is made (correctly) that the Standard permits SIB 5 and SIB 7 to be concatenated if the network chooses to do so. The point was not addressed in evidence but IPCom may be right that the network analysed in Fig 5 of the Qualcomm paper shows SIB 5 and SIB 7 concatenated however if that is so then the other two networks (figs 2 and 3) do not concatenate SIB 5 and SIB 7.

94. Although IPCom does not say so in terms, the argument about contiguity and concatenation of SIBs is really based on the premise that SIB 5 can be regarded as one bit pattern while SIB 7 is another. HTC submitted that such an argument was hopeless for two reasons. First the individual SIBs do not have the attributes of a bit pattern as they have a variable form and variable length and second, the two components of the relevant access authorisation data are never sent in/as a SIB, they are in separate SIBs. HTC referred to paragraph 2.4 of the fourth report of Mr Simmons in which he addressed the detail of how SIBs are made up of optional and mandatory elements, their variable length and how they are scheduled. He concluded at paragraph 2.5:

> "Hence, it would be correct to say that information broadcast on the BCCH is arranged into a number of data structures comprising various bit patterns and bit strings contained within the overall data structure, that are sent according to scheduling information and other information that is also provided over the BCCH and by the UMTS standard."

95. The point of this evidence is to show that while the BCCH includes data sent as bit patterns, it also includes data sent in other formats.

96. If both SIB 5 and SIB 7 were each a bit pattern, then it could be said for each of the two pieces of access authorisation information that each is transmitted as a bit pattern. On that basis two distinct bit patterns would be used overall, one for each piece of information. If that was the only point of alleged distinction between UMTS and the claim then I would favour the patentee. In other words despite paragraph [0035] of the specification and the distinction between the first and second embodiment in terms of numbers of bit patterns, I do not accept HTC's argument that the language is not apt to cover a case in which each of the two pieces of information are transmitted as a bit pattern, albeit each is in a different bit pattern, provided the system needs both at the same time, as in UMTS. The words "transmitted as a bit pattern" refer to the format in which the data is transmitted and would be satisfied in that case. This interpretation would not cover the first embodiment, in which the two bit patterns are alternatives. The interpretation takes due account of equivalents as a matter of construction (Art 2 of the Protocol on the Interpretation of Art 69 EPC). The inventor's purpose is not the only consideration but nevertheless it is relevant to note that the objective of using the transmission efficient bit pattern format would be fulfilled on this construction of the claim.

97. However the issue of infringement also involves questions of fact about how UMTS operates as well as issues of claim construction. On the questions of fact, I accept Mr Simmons' evidence about the BCCH. My conclusions on infringement are as follows. Merely because data is sent on the BCCH does not mean that data is sent as a bit pattern. I am not satisfied that either SIB 5 or SIB 7 is itself a bit pattern. Both may (or may not) contain some bit patterns but that is a different point and was not established in any event. I am not satisfied that the access authorisation data in UMTS is transmitted in a bit pattern format at all. Accordingly UMTS does not infringe the claim.

the access class bit

98. At feature E the claim provides that the mobile receives a collection of bits (plural). That includes access class bits (plural). At feature G and feature K, the claim provides that the mobile uses the access class bit (singular) relevant to its user class to determine whether it must perform the lottery or not. The difference between the singular and the plural usage in the claim is clear and would be understood by the skilled addressee. The plural is used in feature E because it is referring to the bits for all the user classes whereas the singular is used in features G and K because the claim is there referring to the bit associated with the relevant user class.

99. The infringement issue can be stated simply. The AC to ASC mapping information element was held to be access class information in the previous proceedings. The

question is whether the fact that this information element consists of a three bit binary number means that there is no infringement given that the claim now requires determination by means of "the access class bit".

100. At a conceptual level, there is only one bit's worth of information which needs to be conveyed to the mobile in UMTS in order for it to make its decision. This decision is, as was suggested in argument, a binary decision. Although neither side put it this way, the real debate on construction between the parties can be characterised as an argument about whether the claim is limited to a physical bit (HTC) or whether it encompasses a system which sends a conceptual bit's worth of information in amongst other information (IPCom). It is an issue which can only be understood with an eye on the infringement case. However before I get to the real debate, there are some other points to deal with.

101. First Dr Irvine suggested that consideration of lower layer signalling and the symbols in the physical data stream were relevant. I do not accept that. The skilled addressee would understand the patent and the claim as being concerned with a particular layer in the protocol stack. What takes place at lower layers is not relevant.

102. Second, Dr Irvine suggested that there were circumstances in which it could be said that a single bit determined the access issue and so the claim was satisfied at least sometimes. That was on the basis that as between ASC 1 (coded as 001) and ASC 0 (coded as 000), the last bit on its own determines whether the lottery is to be performed or not. However as Dr Irvine accepted the mobile cannot know whether those are the only two possible ASCs available. As far as the mobile is concerned, there are eight possible ASCs and so all three bits have to be checked. Even if the network in fact only sent 001 or 000, the mobile would not know that that was what the network was doing and would have to check all three bits. This argument does not help IPCom.

103. Third, there were refinements of this argument, neither convincing. One was that regardless of whether the mobile thought only two ASCs were in use, it would be true that if the first two bits were zero, the single third bit is what determines the matter. That is true but it does not take into account the fact that the mobile has to check all three bits. Another refinement was to contend that what matters is that there is a "1" somewhere. That is also true but simply shows that three bits need to be checked.

104. Fourth was a point arising from information theory that sending a single bit for each user class is not always the most efficient thing to do. This is true if the data is not evenly distributed. Take eight classes (0, 1, 2, etc). Sending a single bit per user class, i.e. a flag, would require eight bits. To code a numerical identifier for each user class would need three bits for each one. The operator could arrange things so that the mobile assumes its user class puts it in one group unless the identifier for that class is sent. If the identifier is sent then the class is in the other group. If the data is not evenly distributed so that most of the time there are only one or two classes in one group, then the system may be able to use an average of fewer than eight bits (one per class) by simply sending identifiers. Two identifiers would only need six bits. Even if three or more identifiers have to be sent sometimes, if the averages work out favourably then this scheme is more efficient. I accept Dr Irvine's evidence on this as a matter of information theory arising from uneven data distribution but I do not

accept it has any impact on the true construction of the claim. The claim contemplates sending access class bits, i.e. flags.

105. Fifth, IPCom submitted that paragraph [0036] of the specification showed that the inventor was not concerned with the number of bits used. In my judgment that paragraph would not be understood by the skilled addressee in a manner which assists IPCom. The paragraph does refer to changing numbers of bits but it is quite clear what it is contemplating. It contemplates omitting bits which are not required by the claim (e.g. the P and D bits), changing the number of S bits to give a larger or smaller number of possible threshold values and changing the number of Z bits to accommodate a larger or smaller number of user classes. However there is nothing in that paragraph which would be taken by the skilled addressee as contemplating that the determination of the mode of RACH access (direct or lottery) could be indicated by anything other than one bit per user class.

106. Sixth IPCom submitted that as a matter of language the singular can include the plural, referring to common speech and to EPO decision T0943/90. The general point is true but does not help to decide this issue. There was also a battle of the analogies with IPCom's counsel referring to "taking the train from Manchester to London" as allowing for a change of trains while HTC's counsel (also in the context of bit patterns) referred to his family "travelling to Birmingham in a car", which meant one car and not two or more. I did not find the analogies useful.

107. Seventh, IPCom submitted there was no emphatic or prescriptive statement in the claim which "positively requires one bit only per user class". This is not a good point. The entire claim is a piece of prescriptive language. It is the definition of the invention and defines the legal monopoly granted by the patent.

108. Moreover if and to the extent that knowledge of patent drafting practice is imputed to the skilled addressee, they would not expect emphatic language in a claim and would not place significance on its absence. There are rare cases in which a patent claim has been granted with emphatic words but they are just that, rare.

109. IPCom's best point was that in UMTS what is going on is that spare capacity within the three bits used for identifying various ASCs is employed to encode the single conceptual bit's worth of information required by the claim. The point is that there are seven ASCs for which access must be via the lottery (ASCs 1 to 7) while there is an eighth (ASC 0) for which access to the RACH does not require the lottery. To encode the seven ASCs 1 to 7 requires three bits but leaves spare capacity (because three bits allows for eight numbers, not seven). So rather than send a separate physical bit which distinguishes between the ASCs which must do the lottery (ASCs 1-7) and the ASC which does not (ASC 0), in addition to three physical bits which identify ASCs 1 to 7, one simply codes all the information within the three physical bits. The distinction was depicted in two diagrams X5 and X6 which are attached in Annex 3. In effect X6 is UMTS and the two diagrams show (as was accepted by Mr Simmons) that X6 produces the same outputs as X5. In X5 an access class bit is sent separately.

110. Dr Irvine supported IPCom's case. His view was that in UMTS the access class bit required by the claim had been coded together with other related information.

111. The diagrams at X5 and X6 were put to Mr Simmons in cross-examination. Although Mr Simmons had previously expressed the view that a single bit is always the most efficient way of coding a binary decision, he accepted that that was not so in a case in which you had other dependent data which you wished to send at the same time. That is what is illustrated by X5 and X6.

112. HTC submitted that X5 and X6 neatly showed why UMTS did not infringe because they illustrate that UMTS (which is X6) could be rewritten to include a flag, in which case it would infringe (which is X5). I do not accept it is that simple. In my judgment the significance of these figures and the experts' evidence on this issue is the following. First, in the context of UMTS, encoding the conceptual binary information about access class along with three other bits worth of dependent data is actually more efficient in terms of transmission than sending a separate physical access class bit would be. Second, the two schemes produce the same outputs as each other. Third, apart from the point about transmission efficiency, there is no evidence that one arrangement makes any material difference to the way the invention works as compared to the other.

113. HTC submitted that what had been missed out from X5 and X6 and the cross-examination of Mr Simmons was that the ASCs have another distinct function, related to the physical part of the random access channel and to channelization coding. The point is that the AC to ASC mapping tells the mobile which PRACH partition it is associated with and that information has other significance apart from any question of scaling factors in the lottery (c.f. paragraph 185 quoted from Floyd J in the section introducing UMTS above). I accept that HTC are correct that the ASCs can be used for PRACH partitioning but the point is irrelevant. The fact that UMTS uses the information in that manner for another purpose does not alter the fact that, in the context of the determination of access to the RACH via the lottery or directly, there is spare capacity in the three bits.

114. Turning to the claim language itself, the skilled addressee would understand features G and K to refer to the decision making step rather than the data transmission step. In that respect it is different from the reference in feature C to transmission of information as a bit pattern. The decision made by the mobile is a binary determination: either one thing or another. Conceptually only one bit is required in order to make such a decision and in that sense the language of the claim means what it says, one single bit. One cannot disregard this limitation (see ***Virgin*** sub-paragraph (vii)). However in my judgment the skilled addressee would understand that, read in context, the single bit's worth of information required is a conceptual bit rather than a physical bit. A system which sends the single access class bit as a single conceptual bit's worth of information albeit encoded along with other dependent information so as to be as transmission efficient as possible, falls within the claim.

115. Finally I will consider the Protocol on the Interpretation of Art 69 EPC directly. To interpret the claim as covering a single conceptual access class bit rather than a physical bit takes due account of equivalents as a matter of claim construction (see Art 2 of the Protocol). It does not allow the claim to be stretched beyond the language used by the patentee. It provides fair protection for the patentee because in UMTS, the decision whether to allow direct access to the RACH or access via the lottery is made using a single conceptual access class bit which is conveyed by the network to the mobile. The result provides reasonable certainty for third parties because the

requirement in the language of the claim, when that is properly understood in context, is fulfilled. In my judgment the UMTS arrangement satisfies the claim language in this respect.

Infringement by classes B – G

116. Under s71 of the Patents Act 1977, HTC sought a declaration of non-infringement in relation to a series of other classes of product labelled classes B to G. These are the same as the classes with the same labels considered by Floyd J as between IPCom and Nokia and not appealed to the Court of Appeal. These products were held not to infringe the claim for reasons which have nothing to do with the issues live before me. IPCom do not positively contend that the devices in these classes do infringe. I gratefully adopt the reasoning of Floyd J at paragraphs 204 to 207. I will not repeat it.

117. The only point which arose in relation to these devices which was not live before Floyd J was an argument that the B devices can be regarded as operating in accordance with the patent on the basis that the scaling factors (see S_1, S_2 etc.) which can be used in the lottery calculation (see paragraphs 181 and 185 of Floyd J, quoted above). The argument was advanced in Dr Irvine's first report dated 17th October 2013 but in cross-examination he accepted it was contrived. I agree and I will not consider it further.

118. Thus I am satisfied that classes B to G do not infringe the patent. IPCom contended that I should not grant a declaration of non-infringement in relation to four of the six classes (C, E, F and G) because there was no evidence that HTC are making, importing or doing any act in relation to phones in those classes. It did not oppose declarations for classes B and D.

119. HTC submitted declarations for all classes should be made. They submitted as follows. First no claim of right is required for s71 nor even an intention by the applicant to do the act (***Nokia v InterDigital*** [2006] EWCA Civ 1618, per Jacob LJ para 17). It is enough for an applicant to say "I should like to do this if I can". Second, for part of these proceedings, IPCom ran a positive case in the pleadings that class B infringed and asserted a positive case that all six classes do infringe. A letter from IPCom's solicitors on 11 October 2013 is referred to. As I understand counsel's submission on instructions, HTC have sold millions of phones at least in classes B and/or D. Third, it is obvious HTC wants the certainty of declarations relating to the B to G devices so that they can lawfully work them if there is a reason to do so. Fourth HTC contended that the state of the correspondence was such that if the matter really required evidence and a formal finding of fact, then the parties had agreed that was for a subsequent hearing.

120. I will grant the declarations sought for the first three reasons advanced by HTC. In this case there is no need for a formal finding of fact about HTC's intentions.

Essentiality

121. Since I have found the class A phones do not infringe, the patent is not essential to the UMTS standard and I should not grant a declaration of essentiality.

Added matter

122. HTC submitted that if the claim was construed as IPCom contended for on either point then the claim would be bad for added matter as an intermediate generalisation. As to matters of claim interpretation I have reached conclusions more in favour of IPCom than HTC, albeit IPCom has failed on the facts relating to bit pattern. Thus the added matter argument is live but in any event I can deal with the objection shortly.

123. The law on added matter was addressed fully by the Court of Appeal when this patent was before them at paragraphs 46-60. I also refer to the more recent judgment of the Court of Appeal in ***AP Racing v Alcon*** [2014] EWCA Civ 40 and in particular paragraph 33. The significance of that latter reference is that it addresses the legal principle which provides the basis for my rejection of HTC's added matter case.

124. HTC's point is that if construed as IPCom contend so multiple bit patterns are covered and so also are multiple access class bits, then the claim is an intermediate generalisation. By this they mean a generalisation wider than the narrow second embodiment (which discloses only one physical access class bit and one bit pattern) and narrower than the wide general disclosure in the specification (which is not limited to bit patterns and allows for any access class information in general). I agree with HTC that in terms of its coverage the claim does indeed cover something more general than the second embodiment. In that sense as a matter of coverage the claim is an intermediate generalisation.

125. However as the line of cases leading from ***AC Edwards*** to ***AP Racing*** paragraph 33 explains, English patent law draws a distinction between coverage and disclosure. To amount to added matter the intermediate generalisation must be a generalisation in terms of disclosure, not coverage. In other words to characterise a claim as an intermediate generalisation is not sufficient to establish the presence of added matter. Proving that a claim is an intermediate generalisation in terms of coverage does not establish added matter.

126. It is on the distinction between coverage and disclosure that the argument founders. The claim refers to transmission "as a bit pattern" and to an "access class bit". Read in the context of the specification as a whole, nothing further is disclosed beyond what is described in the second embodiment. The skilled addressee reading the claim is not given new information as compared to the second embodiment. The language may cover more schemes than the second embodiment but that is not the issue.

127. The added matter point fails.

Allowability of the amendment

Clarity

128. Although s76 does not mention clarity, claims are required to be clear and concise by s14 of the 1977 Act (based on Art 84 EPC). Moreover in the EPO (relevant as a result of s75(5)), lack of clarity is a ground for refusing an amendment. Therefore the

court can and should refuse an application to amend a claim if the amendment is unclear. HTC contend that the words "as a bit pattern" are avoidably obscure insofar as they arguably cover multiple bit patterns and the amendment should be refused on clarity grounds.

129. I reject this submission. The fact that there was a lot of argument about the meaning of the claim at trial does not mean it lacks clarity. Nor is a lack of clarity revealed by the length (no doubt too long) of the passages in this judgment dealing with it. The skilled addressee would have no difficulty understanding this claim. The fact that an infringement issue may be tricky to decide does not mean the language is ambiguous. It is not.

Discretion

130. HTC contend that the claim as construed by IPCom is different in scope from the one allowed by the EPO and, if that is so, the amendment should be refused in the exercise of the court's discretion under s75. Although the discretion is much reduced in scope compared with the past, HTC submit that it remains wide enough to justify refusal of the amendment if the premise is satisfied.

131. The major argument was about "as a bit pattern" and although I have rejected IPCom's infringement case, I have not accepted HTC's construction of the claim. I do not need to decide whether the claim in the UK has a different scope from the one allowed by the EPO because even if it does I would not refuse the amendment as a matter of discretion. The claim in the form sought here is valid and the amendment is formally allowable. It does not add matter nor does it extend the scope of protection. In that case I do not see why it would be a proper exercise of the discretion under s75 to refuse a valid claim amendment simply because it produced a claim with different scope from the one allowed by the EPO, even if, as here, the ostensible motive for the application to amend was to produce a claim with the same scope. All the more so when the difference (if it exists) arises in the context of a debate about translations. So I reject HTC's case on that basis.

132. However in case the matter goes further, I will consider the evidence filed by both sides on its merits and make findings of fact (albeit since there was no cross-examination if the matter goes further an appellate court would be in as good a position to do that as I am). My findings are in Annex 1

Conclusion

133. I find that HTC's mobile phones do not infringe IPCom's patent EP (UK) 1 841 268. The amendment is allowed. The patent is valid.

Annex 1 – what took place before the EPO on 7th March 2013

i. There is no doubt that the Opposition Division held that claim 1 as granted involved added matter and was invalid. There is no doubt that at the hearing in the Board of Appeal on 7th March 2013 the patentee withdrew all the various proposed amended forms of claims which had been advanced before and filed a new main request, which was accepted by the Board as compliant with Art 123(2) and Art 123(3). This can all be derived from the public decision of the Board of Appeal T1281/12. What is not apparent from the decision but can be seen in the separate minutes of the oral proceedings is that the claim set which was accepted was advanced as a new main request at 7pm in the evening after a 9am start.

ii. In fact most of the time at the hearing seems to have been spent considering sets of claims which the Board was rejecting, one after another. What is not recorded anywhere are the reasons why the Board rejected the various other claims sets put forward, but that is conventional EPO practice.

iii. In the EPO a patentee is entitled to advance as many sets of proposed amended claims as the tribunal will permit during the course of a hearing. Each set is a separate "request", with a main request as the first set the patentee wants and then series of auxiliary requests. If in the end the tribunal accepts one set of claims, it is open to the patentee to withdraw all its other requests. Since under EPO practice the written decision only has to give reasons relating to requests which are still live at the conclusion of the proceedings, that withdrawal has the effect that the written decision only has to address the single outstanding request. That is what happened in this case. Since IPCom had the ability to ensure that the Board of Appeal gave its reasons for rejecting earlier requests, it can hardly complain if its account of why the Board did what it did is not accepted.

iv. In any event HTC's evidence is in part aimed at filling in the deficit and in particular in focussing on the penultimate set of claims advanced by IPCom and how that set had to be amended to give rise to the new main request which was accepted. The penultimate set of claims included an amendment to introduce the bit pattern language. The language of the proceedings was German. The feature proposed to be introduced was "*wobei die Zugriffsberechtigungsdaten als Bitmuster übertragen werden*". This was not accepted by the Board. An alternative was advanced with the words "*wobei die Zugriffsberechtigungsdaten als* **ein** *Bitmuster übertragen werden*" (my emphasis). That was accepted and is the wording in the main request allowed by the Board.

v. This German text corresponds generally to the phrase in the claim before me "*wherein the access authorization data are transmitted as a bit pattern*" however there are two linguistic points. First the word "*Bitmuster*" means "bit pattern" but in German "*Bitmuster*" can be singular or plural. HTC contends (but IPCom does not agree) that the reason the EPO insisted that "*als Bitmuster"* was changed to "*als ein Bitmuster"* was in order to exclude the plural.

vi. Second, as the expert translator Susanne Hinterleitner explains, in German "*ein*" is both the indefinite article and is also the word for the number one. So grammatically "*als ein Bitmuster"* could be regarded as meaning "as one bit pattern" or "as a bit pattern". Ms Hinterleitner expresses the opinion that the correct translation in this case is "as one bit pattern". Her view is that one could already translate "*als Bitmuster"* as "as a bit pattern

(or bit patterns)" and so the reason for inserting "*ein*" must be to clarify that the singular rather than the plural is intended. She gives an example as follows:

> 'The Duden-Oxford Dictionary says under the entry
>
> > *"als" ("as"):*
> >
> > …
> >
> > 5) *(in der Eigenschaft* [in the capacity of]*) as; als Rentner/Arzt: as a pensioner/a doctor*
> >
> > …
>
> While in English you would form a sentence such as "*As a pensioner, I do not work any more*", in German you would say "*Als Rentner arbeite ich nicht mehr*". Although, the word "*ein*" may be inserted into the sentence ("*Als ein Rentner*") where it says "*a*" in English ("*a pensioner*"), as demonstrated in the dictionary extract set out above, it is in fact not necessary. It would also sound very awkward to a native German speaker.'

vii. As to the Board's motives, HTC has produced witness statements from individuals present at the hearing who state their view that the change was intended to limit the claim to only a single bit pattern because if it referred to plural bit patterns, that would be added matter. On the other hand IPCom's representative before the EPO, Mr Molnia, explains his view that the problem the Board were concerned about was a different one, albeit derived from the fact that "*Bitmuster"* could be singular or plural. Mr Molnia (who is bilingual in German and English) states that the Board were concerned that if one read "*als Bitmuster"* in the plural form that would appear to be positively requiring multiple bit patterns, in other words two or more bit patterns, whereas the second embodiment relied on by IPCom as supporting disclosure did not require multiple bit patterns. This concern was addressed by changing the text to "*als ein Bitmuster"* which he says translates as "as a bit pattern". That language does not exclude the singular and was accepted by the Board. Mr Molnia also states that there was then what he calls a vigorous attempt by Nokia and HTC to persuade the Board to declare that the new claim meant single bit pattern, which the Board declined to do.

viii. In reply to Mr Molnia's evidence, Ms Hinterleitner expresses the view that while "*als Bitmuster*" can be understood to refer to a singular or multiple bit patterns it cannot be understood as a reference to exclusively multiple bit patterns. If the intention had been to refer to one or several bit patterns then there was no need to change the words because that is precisely what "*als Bitmuster*" leaves open. Also she does not agree with Mr Molnia that "*als ein Bitmuster"* can mean at least one bit pattern.

ix. In terms of the correct way to translate German into English I have no hesitation about preferring Ms Hinterleitner's opinion to that expressed by Mr Molnia. She is an independent translator. Mr Molnia was IPCom's representative. Thus I find that the term "*als ein Bitmuster"* in the claim before the EPO would be best translated in English as "as one bit pattern".

x. However the fact that Ms Hinterleitner's view is that as a matter of German "*als Bitmuster*" should not be read as exclusively plural does not rule out the possibility that the EPO Board of Appeal were in fact concerned from a clarity point of view that the phrase might be at least capable of being understood that way and therefore required that it be changed in the manner proposed by Mr Molnia.

xi. None of the witnesses who attended the hearing are independent. Each ascribes motives to the Board which support their client's view of the case. The accounts are consistent in that the reason for inserting "*ein*" was obviously related to the fact that "*Bitmuster*" can be plural or singular. Equally it is clearly true that after "*als ein Bitmuster"* was accepted, there was further argument from the opponents as Mr Molnia explains. Where the two accounts differ, neither is so implausible as to be readily ignored.

xii. I am not convinced that it is possible to decide what the motives of the Board were in requiring this change in language. However if I have to come down on one side or the other, I would hold that the Board insisted on the insertion of the word "ein" for the reason advanced by HTC, that is in order to limit the language in the claim to one bit pattern. That seems to me to be more likely to have been the reason and fits better with the linguistic evidence, in which I prefer Ms Hinterleitner.

Annex 2: *Other decisions – Germany and Italy*

i. HTC contends that in Italy on 4th April 2014 in case No. 20650/10 which HTC brought against IPCom, the Turin Court decided that EP 268 was not infringed. The Italian court reasoned as follows. The original wording of the patent has become null and void since IPCom had given up its challenge to the Opposition Division's decision of May 2012. The later decision of the Opposition Division upholding the new claim was not yet final due to Art 106 EPC. Since no amended claim had been submitted by IPCom in the Italian proceedings, the court held that the subject matter of the dispute did not exist and dismissed the claim. This is a very different procedural situation to the one before me and so the Italian court's reasoning does not apply.

ii. In Germany the patent (and a German national equivalent) has come before a number of courts in a number of parallel cases involving Apple, HTC, Media Markt (which sells HTC phones), and Nokia. There are a number of infringement decisions in the first instance district court in Mannheim (the Landgericht Mannheim). These include cases 2 O 53/12, 2 O 95/13, 7 O 30/12, and 7 O 29/12. There is one infringement decision at first instance in Munich (Landgericht München, case 21 O 28158/11). One of the Mannheim decisions has reached the appeal stage and been dealt with by the Oberlandesgericht Karlsruhe (higher district court).

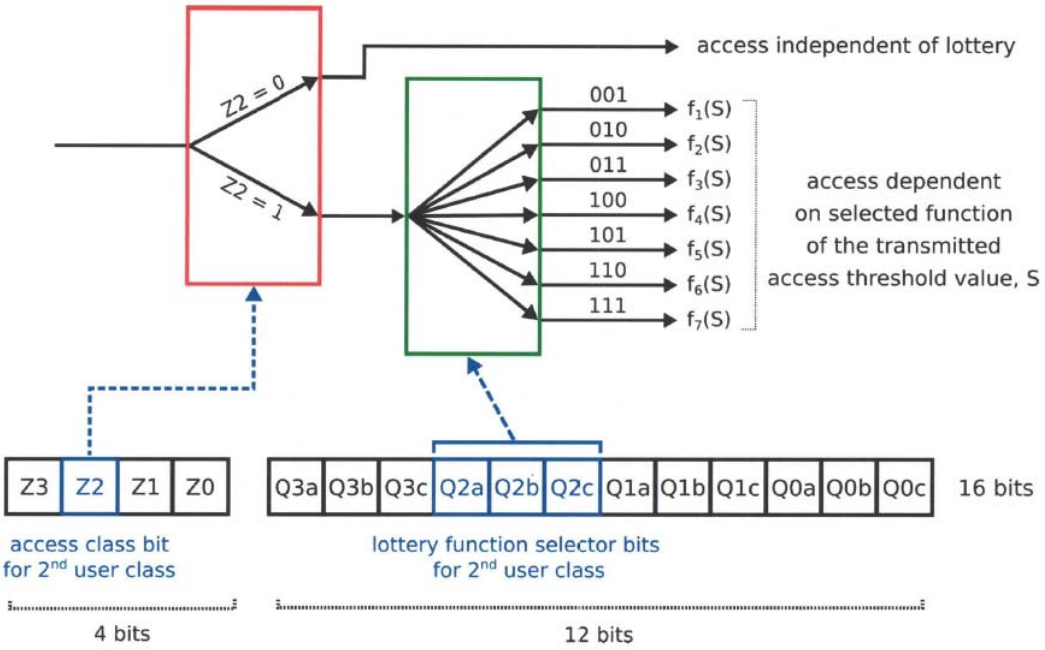
iii. In all of the Mannheim and Karlsruhe decisions the courts have held that the patent (or the German equivalent) is not infringed by phones operating according to the UMTS standard, based on a claim in the form allowed by the EPO Board of Appeal. I have not been taken in detail through all these decisions but I was shown a representative example of one of the decisions of the Landgericht Mannheim and I was shown the decision of the Oberlandesgericht Karlsruhe. The Mannheim court held that the three bit AC to ASC mapping information element did not fall within the claim given the reference to "the access class bit". The Mannheim court did not address the bit pattern issue. The Karlsruhe court came to the same conclusion as the lower court about the access class bit but also addressed the bit pattern issue. On bit pattern, the Karlsruhe court held that the claim required the use of a uniform, associated bit sequence having a specific length and found that that feature was satisfied by UMTS but only on the basis of concatenation of SIBs in UMTS.

iv. On the other hand in a later decision the Munich court came to a different view in a decision on 19th December 2014. That court held in favour of IPCom on both the bit pattern issue and the access class bit issue. I believe the court held that the use of two separate bit patterns would satisfy the claim and also that what was decisive vis-à-vis the bit pattern point was that the mobile receives the necessary information over a signalling channel. On the access class bit issue the court concluded that the claim did not require user class to be determined on the basis of one single physical access class bit.

v. The German decisions are focussed on the same issues that are before me. However it is striking that the later decision of the Munich court does not appear even to mention the earlier decisions of Mannheim or Karlsruhe and has reached a different conclusion overall for different detailed reasons. Given that local courts in Germany take this approach, there is no purpose in extending the length of this judgment even further by addressing those decisions in any greater detail.

Annex 3 – Diagrams X5 and X6

X5 – using an extra bit:



X6 – saving the extra bit: