

**Internal distribution code:**

- (A) [ ] Publication in OJ  
(B) [ ] To Chairmen and Members  
(C) [X] To Chairmen  
(D) [ ] No distribution

**Datasheet for the decision  
of 22 January 2010**

**Case Number:** T 0512/07 - 3.5.05

**Application Number:** 02028885.8

**Publication Number:** 1326361

**IPC:** H04L 1/18

**Language of the proceedings:** EN

**Title of invention:**

Signal design to transmit binary information of unequal importance

**Applicant:**

LG Electronics Inc.

**Headword:**

ACK/NACK-transmission with different power levels/LG

**Relevant legal provisions (EPC 1973):**

EPC Art. 83  
EPC R. 27(1)(e)

**Keyword:**

"Sufficiency of disclosure (no)"

**Decisions cited:**

T 0409/91

**Catchword:**

Objections under Article 83 EPC 1973 cannot be overcome by amendment of the description and drawings, since the amendment would then add subject-matter to the application as filed. The presently claimed subject-matter has to be examined for compliance with Article 83 EPC on the basis of the application documents as originally filed (Reasons 3).



Case Number: T 0512/07 - 3.5.05

**DECISION**  
of the Technical Board of Appeal 3.5.05  
of 22 January 2010

**Appellant:**

LG Electronics, Inc.  
20, Yoido-Dong  
Yongdungpo-Ku  
Seoul (KR)

**Representative:**

TER MEER - STEINMEISTER & PARTNER GbR  
Patentanwälte  
Mauerkircherstrasse 45  
D-81679 München (DE)

**Decision under appeal:**

**Decision of the Examining Division of the  
European Patent Office posted 19 October 2006  
refusing European application No. 02028885.8  
pursuant to Article 97(1) EPC 1973.**

**Composition of the Board:**

**Chairman:** D. H. Rees  
**Members:** M. Höhn  
G. Weiss

## **Summary of Facts and Submissions**

- I. This appeal is against the decision of the examining division announced in oral proceedings held on 27 September 2006, with written reasons dispatched on 19 October 2006, refusing European patent application No. 02028885.8 because the invention was not disclosed in a manner sufficiently clear and complete for it to be carried out by a skilled person (Article 83 in combination with Rule 27(1)(e) EPC 1973) and because the scope of protection was not clear (Article 84 EPC 1973).
- II. The notice of appeal was received on 20 December 2006. The appeal fee was paid on the same day. The statement setting out the grounds of appeal with letter dated and received 28 February 2007 requested that the decision be set aside and that a patent be granted on the basis of claims 1 to 7, amended specification pages 1 to 5, 5a, 5b and 6 to 16 as well as amended figures 1 and 2, all annexed to the letter. Further, oral proceedings were requested as an auxiliary measure.
- III. Together with the statement setting out the grounds of appeal, the appellant submitted a copy of section 6.4.4 of the textbook
- Lüke, Hans Dieter: "Signalübertragung: Grundlagen der digitalen und analogen Nachrichtenübertragungssysteme", 4th Edition - Springer, Berlin, 1990.
- IV. A summons to oral proceedings to be held on 22 January 2010 was issued on 19 October 2009. In an annex accompanying the summons the board expressed the

preliminary opinion that the requirements of Articles 123(2), 83 and 84 EPC 1973 appeared not to be fulfilled, and that claim 1 appeared to lack novelty (Articles 52(1) and 54(2) EPC) over the prior art described in the application. The board gave its reasons for the objections and why the appellant's arguments were not convincing.

- V. With a letter dated and received 22 December 2009 the appellant filed two sets of amended claims, two different versions of amended figures 1 and 2, and amended pages 5, 5a, 5b, 7, 12 and 17 of the description, on which a new main request and new auxiliary requests I to III were based. Further, the appellant enclosed the technical specification 3GPP TS 25.214 V5.1.0 (2002-06) and a copy of a 3GPP web page containing information about TS 25.214. The appellant also presented arguments supporting the patentability of the application.
- VI. Oral proceedings were held on 22 January 2010 in the course of which the appellant's representative withdrew the main request and auxiliary request I which were based on the first version of amended figures 1 and 2. The former auxiliary requests II and III (based on the second version of amended figures 1 and 2) were renumbered to be the new main and auxiliary requests.
- VII. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 8 (main request) or in the alternative on claims 1 to 6 (auxiliary request), both requests submitted as auxiliary requests II and III with letter received on 22 December 2009. The main and auxiliary

request I filed with letter received on 22 December 2009 were withdrawn.

The complete text on the basis of which grant of a patent was requested is as follows:

main request:

claims 1 to 8 indicated as Main Request filed on 22 December 2009;

description pages

5, 5a, 5b, 7, 12 and 17 (page 17 empty) filed on 22 December 2009,

1 to 4, 6, 8 to 11 and 13 to 16 as originally filed;  
and

drawing sheets 1 and 2, indicated as Version II filed on 22 December 2009;

auxiliary request:

claims 1 to 6 indicated as Auxiliary Request filed on 22 December 2009;

description and drawings as in the main request.

VIII. The sole independent claim of each of the requests reads as follows:

Main request:

"A method of transmitting acknowledgement signals in a communication system, the method comprising:

- receiving data from a base station;

- transmitting an acknowledgement (ACK) signal to the base station via a specific channel with a specific transmission power when the data from the base station is received without error, and
  - transmitting a negative acknowledgement (NACK) to the base station via a specific channel with a specific transmission power when the data from the base station is received with error,
- characterized in that
- the specific transmission power for the specific channel is determined according to whether the type of the acknowledgement signal is the ACK or the NACK."

Auxiliary request:

"A method of transmitting acknowledgement signals in a communication system, the method comprising:

- receiving data from a base station; and
  - transmitting an acknowledgement (ACK) signal to the base station via a specific channel with a first specific transmission power when the data from the base station is received without error, and
  - transmitting a negative acknowledgement (NACK) to the base station via a specific channel with a second specific transmission power when the data from the base station is received with error,
- characterized in that
- the specific transmission power for the specific channel is determined according to whether the type of the acknowledgement signal is the ACK or the NACK, wherein a first power offset value ( $\Delta_{ACK}$ ) is used for determining the specific transmission power, when the type of the feedback signal is the ACK, and a second power offset value ( $\Delta_{NACK}$ ) is used for determining the

specific power, when the type of the feedback signal is the NACK, and

wherein the first power offset ( $\Delta_{ACK}$ ) and the second power offset ( $\Delta_{NACK}$ ) indicate a relative power level between a High Speed Dedicated Physical Control Channel (HS-DPCCH) and a Dedicated Physical Control Channel (DPCCH)

wherein the first power offset ( $\Delta_{ACK}$ ) and the second power offset ( $\Delta_{NACK}$ ) are independently set by a higher layer."

IX. After deliberation the board announced its decision.

### **Reasons for the Decision**

1. The appeal is admissible.
2. The present application is in the field of automatic repeat request (ARQ) and deals with the transmission of positive (ACK) and negative (NACK) acknowledgement signals from the data receiver station to the transmitter station (or "base station") with different power. In addition, under special circumstances, the receiver does not send back an acknowledgement signal at all, so that there is no signal, which can be interpreted as a signal with a transmission power of zero, called DTX. A threshold for the received acknowledgement signals is used in the data transmitter station in order to decide whether the signal received is an ACK, NACK or DTX signal.

Main request

**Article 83 EPC 1973 and Rule 27(1)(e) EPC 1973**

3. During the appeal proceedings, the appellant has extensively amended the application documents. Objections under Article 83 EPC 1973 may under some circumstances be overcome by amending the claims, since thereby the "invention" referred to in Article 83 may be so changed that it no longer depends on the insufficiently disclosed aspects of the application for its realisation. However such objections cannot be overcome by amendment of the description and drawings, since the amendment would then add subject-matter to the application as filed. In general, the presently claimed subject-matter has to be examined for compliance with Article 83 EPC 1973 on the basis of the application documents as originally filed. In the present case the objection raised by the examining division concerned the disclosure of how to determine the powers of the ACK and NACK signals. This determination remains essential to carrying out the invention as defined in the independent claim of each of the present main and auxiliary requests.
  
4. The appellant essentially argued that in original figures 1 and 2 the y-axis pointing upwardly from 0 (DTX) showed the power level on a linear scale for the transmission power to be used for ACK signals. Similarly, the y-axis pointing downwardly from 0 (DTX) showed the increasing power level on a linear scale for the transmission power to be used for NACK signals. The transmission power of the ACK and NACK signals was of opposite polarity. In the introductory portion of the



specification it was explained with regard to figure 1 that the background art receiver utilized one bit to transmit the response signals (page 3, lines 20, 21). In general the term "one bit signal" (cf. page 3, first paragraph) was used to refer to the digital signal which could have the logical value "0" or "1". Thus, ACK could be represented as "1" (or "0") and NACK could be presented as "0" (or "1"). Further, the first paragraph on page 3 indicated that the ACK/NACK signals were transmitted as "+1" or "-1", referring to the analogue form. In contrast, the first paragraph on page 16 of the description as filed was argued to be related with the logical or digital value of the acknowledgment bit that did not refer to the analogue or physical form (submission of 22 December 2009, page 7 last paragraph).

5. However, the board finds these arguments neither clear nor convincing and agrees with the reasoning of the appealed decision that the application considered as a whole does not describe in detail at least one way of carrying out the invention claimed, as required by Rule 27(1)(e) EPC 1973, and does not disclose the invention sufficiently clearly and completely for it to be carried out by a skilled person, as required by Article 83 EPC 1973.

In particular, the teaching of figures 1 and 2 as originally filed, even if interpreted in the light of the corresponding parts of the description (page 3, line 20 onwards, and page 11, line 16 onwards), does not allow a skilled person to carry out the invention, for the following reasons.

5.1 The y-axis of original figures 1 and 2 shows the power level in a logarithmic decibel (dB) scale (see label "POWER LEVEL(dB)") according to which a power level  $P=0$  equals minus infinity. According to the original description (see page 12, lines 1-2) the actual DTX-signal (Discontinuous Transmission, i.e. no response) occurrence is "to occur at 0 power level". On a logarithmic scale, the reference "0(DTX)" would therefore have to be indicated at minus infinity on the y-axis. This, however, is not the case. "0(DTX)" is shown somewhere in the middle of the y-axis, which rather leads the skilled reader to the interpretation that DTX denotes a transmission signal of zero power on a linear scale. This, however, causes the problem that the power level for a NACK-signal, which according to original figures 1 and 2 is lower than the DTX level, would have to be negative, which is not technically possible since power is always greater than or equal to zero.

There is no indication in the application documents as filed that the power levels for ACK signals and for NACK signals shown in figures 1 and 2 are mirrored at 0(DTX) forming a lower and an upper graph with a common x-axis as argued by the appellant. The skilled reader would at least expect a hint in the description or in the drawings for such an unusual interpretation which, however, is not found. The board agrees with the argument presented in point 16(b) of the appealed decision that the decision regions for ACK and NACK signals, indicated on the right hand side of the graph, suggest that there is only one graph and only one decision region threshold applying to all (logarithmic) power levels from minus infinity to plus infinity.

5.2 On page 11, lines 3 to 7 of the application as filed, it is stated that the threshold and transmission power levels are relative powers, expressed in the unit of dB. This statement comes before the description of figure 2 in which the invention is shown and, hence, the skilled reader would expect that the power levels in figure 2 are to be interpreted in a logarithmic scale, which indeed corresponds to the actual label of the y-axis (see label "POWER LEVEL(dB)"). This expectation would be further confirmed by the fact that Tables 1 and 2 of the description also show relative power levels in dB.

The board notes that such an interpretation is also in line with the appellant's argument presented during oral proceedings before the first instance (see section 12 of the minutes) that the expression "0 power level" used in the original description (see page 12, first two lines) to refer to DTX implied decibels (due to the term "level").

5.3 The appellant further argued that the skilled person would therefore realize that noise power must be included in its representation so as to have a zero value as appeared in the figures and not a minus infinite value. The DTX power level shown in original figures 1 and 2 corresponded to the level as seen at reception and, hence, included the noise power received (see points 8 and 12 of the minutes of the oral proceedings).

The board, however, does not find any support for such an interpretation of the DTX power in the original application documents. Firstly the NACK-signal would

then have to be communicated with a power smaller than the noise level. Secondly the board does not think that figures 1 and 2 can be interpreted in such a way that power levels measured at transmission (ACK/NACK transmission power) and a power level measured at reception (DTX) are shown in the same figure. The skilled reader would at least expect a hint in the description or in the drawings for such an unusual interpretation. Such a hint is not found in the application as filed. Thus the board is also not convinced by this possible interpretation (which was not actively pursued during the appeal).

- 5.4 For interpreting the term "power" the appellant referred to section 6.4.4 of the textbook "Signalübertragung" submitted with the statement setting out the grounds of appeal, in connection with an argument that the application was using a negative amplitude factor of  $a = -1$ . However, the publication referred to does not disclose negative amplitude factors and, hence, does not support the appellant's arguments. The board notes that in fact according to the usual definition the amplitude of a waveform cannot be negative.

The board agrees with the examining division that the transmission power of a signal cannot be negative, i.e. have a negative "polarity" (see point 18 of the appealed decision referring to original page 4, lines 12-13). According to the appellant (see the statement setting out the grounds of appeal on page 4, paragraph 6) the term "power" is used throughout the whole specification for power, but not for amplitude or voltage. This means that, according to the appellant,

the label "POWER LEVEL (dB)" on the y-axis of original figures 1 and 2 has to be interpreted as a power level only and does not refer to amplitude or voltage or phase of the waveform. However, even if the skilled person were to interpret the wording "opposite polarity" in relation to the waveform of the NACK-signal (as argued by the appellant, see page 4, last paragraph onwards of the statement setting out the grounds of appeal), the problem persists that the transmission power shown in original figure 1 cannot be "substantially equal in opposite polarity with the  $\Delta A$  power difference relative to 0" on a logarithmic scale of the y-axis, because there is no negative region for showing an opposite polarity of the signal. This would only be possible if a linear scale for the y-axis is assumed, in which case the problems of negative power values referred to above arise.

5.5 The appellant's arguments referred to in sections 4 and 5.2 above show that there are different ways of interpreting original figures 1 and 2, none of which however are ultimately convincing. The fact that plural interpretations are possible merely reinforces the board's conclusion that the disclosure of the application as a whole is not sufficient for the skilled person to know how to interpret the teaching according to the preferred embodiment of the invention as shown in original figure 2.

6. The appellant pointed to the corresponding granted US patent. As the appellant conceded the grant of a patent in the USA is not binding for the EPO granting procedure. In addition, the parallel US patent specification is not identical to the European

application, in particular figures 1 and 2 are different with regard to the logarithmic scale, so that the US patent is based on a different disclosure. The requirements of Article 83 EPC 1973 are not fulfilled if the invention disclosed in the European Patent application can only be carried out with the knowledge of a family member. Thus, the appellant's argument presented in section 3.3 of the statement setting out the grounds of appeal does not convince.

7. The examining division argued in point 13 of the appealed decision, that if the probability  $P(\text{DTX} \rightarrow \text{ACK})$ , i.e. the probability that an ACK-signal is detected although a DTX-signal was transmitted, is taken to be below  $10^{-3}$  for determining the threshold power level, the NACK transmission power cannot be determined such that the probability  $P(\text{NACK} \rightarrow \text{ACK})$  is below  $10^{-4}$  (as assumed in the specific embodiment on page 10, lines 7 onwards, and page 12, line 13 onwards, of the original description). If DTX corresponded to a transmission power of 0 and the received signal contained only noise (see appellant's argument above), the power of a NACK transmission was at least as large as in case of a DTX transmission, since the received power was the sum of the NACK transmission power and the noise power. Therefore the probability  $P(\text{NACK} \rightarrow \text{ACK})$  always had to be larger than the probability  $P(\text{DTX} \rightarrow \text{ACK})$  and the skilled person would not know how to carry out the determination of the ACK and NACK transmission powers and the threshold. As a consequence, the application as originally filed did not sufficiently disclose how to determine the required first and second power offset values and the requirements of Article 83 EPC 1973 were not met.

In the statement setting out the grounds of appeal and in his letter dated 22 December 2009, the appellant did not try to rebut this objection by presenting counterarguments, but instead referred to a probability density function shown in figure 6.15 of section 6.4.4 of the textbook "Signalübertragung" submitted with the grounds of appeal. The original application documents do not disclose or imply a reference to such a probability density function and the appellant did not provide convincing arguments why the skilled person when applying the common general knowledge would consider such a teaching as figure 6.15 for determining power offset values. The appellant's explanation of the determination of the transmission power for a NACK signal is vague (page 6, last paragraph, "In a similar way...") and not detailed and concrete enough to rebut the examining division's objection of insufficiency in the original disclosure. Neither in the written appeal procedure, nor during oral proceedings before the board, was the appellant able to explain in a convincing way how the invention can be carried out if the probability  $P(\text{NACK} \rightarrow \text{ACK})$  is taken to be smaller than the probability  $P(\text{DTX} \rightarrow \text{ACK})$ . In the light of the above mentioned problems, the board agrees with the objection in points 13 and 14 of the appealed decision, in particular that the example and the table on pages 13 and 14 of the original description do not sufficiently disclose the invention.

8. Throughout the appeal the appellant has argued on the basis of a binary phase shift keying BPSK modulation for carrying out the invention (see e.g. section 3.1 of the statement setting out the grounds of appeal, page 5,

second paragraph from the bottom, and page 6, last paragraph).

- 8.1 However, the board agrees with the examining division that the application as originally filed does not provide an antecedent basis for BPSK and does not directly and unambiguously teach the use of a BPSK modulation for transmission of ACK/NACK acknowledgements (see section 16(a) of the appealed decision). The cited passage on original page 3, first paragraph, of the description deals with the background art only and not with the teaching of the invention. It mentions complementary values of "1" for an ACK-signal and "-1" for a NACK-signal. This might imply a use of complementary binary values to the skilled person, but is then in conflict to the other references to the signals being 0 and 1 in the description, thus leaving the skilled person in doubt as to how only one bit is used to transmit the ACK/NACK signal, since a value of "-1" cannot be coded by using a single bit in a system which also accommodates 0. This rather leads the skilled person away from a use of BPSK modulation for the invention in that it suggests using more than one bit for complementary values or coding a NACK-signal with "0" as disclosed for a concrete embodiment of the invention (see original page 16, lines 5 to 8). As mentioned, the passages referred to by the appellant in the original application are related to the background art, but not to the concrete teaching of the invention. The appellant failed to provide convincing arguments why, even when considering the skilled person's common general knowledge, the application as a whole discloses the use of a binary phase shift keying BPSK modulation for carrying out the invention.



8.2 In addition, the invention as actually claimed is not limited to the use of BPSK or any other modulation scheme. Article 83 EPC 1973 requires a sufficient disclosure for carrying out the invention in the whole range claimed (see e.g. decision T 0409/91, OJ EPO 1994, 653). The appellant failed to provide convincing arguments as to how the invention could be carried out without BPSK modulation. The original application documents do not provide a sufficient disclosure for the use of BPSK or for any other concrete modulation scheme for carrying out a transmission of ACK/NACK acknowledgements according to the invention. A reference to phase detection, if at all, is only found with regard to the background art (see section 8.1 above). Since according to the invention different power levels for ACK and NACK signals are foreseen, there is no indication that the skilled person when reading the application as a whole would additionally consider "opposite polarity" or phase detection for differentiating between an ACK-signal or a NACK-signal in the absence of such a concrete disclosure (see appellant's argument on page 6, first paragraph of the statement setting out grounds of appeal). Original figures 1 and 2 are also silent in this regard. Nor is there an implicit disclosure. In the board's judgement the skilled person could only do so as a result of realizing that the teaching of the invention does not work or cannot be carried out (see the objection in the afore mentioned section 5 of the decision) and would therefore return to the prior art solution.

9. According to page 15, lines 12 to 14, of the application the "entire disclosure" of "Technical

Specification 3GPP TS 25.214 v5.1.0 (2002-06)" shall be incorporated by reference. With the letter dated 22 December 2009 the appellant provided a copy of this technical specification. However it is the established case law of the Boards of Appeal that the entire content of a long document cannot be incorporated in its entirety in this way, but only the relevant, identified, passages. However even in argument, apart from a general reference to clause 5 of this document for showing that it was generally known in the art to determine a specific transmission power for a signal (see page 6, last paragraph of the letter dated 22 December 2009), the appellant did not provide any information identifying passages relevant for the disclosure of the invention which could be an antecedent basis for a sufficient disclosure of the present invention. The board also does not find any information in this technical specification that could be used for clarifying the above discussed problems of interpretation of the disclosure in the original application documents. The board further notes in passing that the publication date of the technical specification (28 June 2002) is later than the claimed priority date of the application (i.e. 5 January 2002) and that any incorporation of passages of the technical specification into the present application would therefore be of relevance with regard to the validity of the priority of the present application.

10. In the light of the above identified problems with the disclosure of the invention the board concludes that the requirements of Article 83 EPC 1973 and of Rule 27(1)(e) EPC 1973 are not fulfilled for the main request.

Auxiliary request

11. The same problems exist for the invention claimed in the auxiliary request.
12. Thus, the application as originally filed does not describe in detail at least one way of carrying out the invention as presently claimed, as required by Rule 27(1)(e) EPC 1973, and does not disclose the invention in a manner sufficiently clear and complete to be carried out by a skilled person, as required by Article 83 EPC 1973.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar

The Chairman

K. Götz

D. H. Rees