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# Datasheet for the decision of 16 January 2007

**Case Number:** T 1493/05 - 3.4.01

**Application Number:** 97909817.5

**Publication Number:** 0932839

**IPC:** G01S 13/34

**Language of the proceedings:** EN

**Title of invention:**
Procedure for the elimination of interference in a radar unit of the FMCW type

**Applicant:**
Saab Bofors Dynamics AB

**Opponent:**
-

**Headword:**
-

**Relevant legal provisions:**
EPC Art. 83, 84, 52(2)

**Keyword:**
"Clarity, sufficiency of disclosure - yes"
"Remittal to the examining division"

**Decisions cited:**
-

**Catchword:**
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**Case Number:** T 1493/05 - 3.4.01

# D E C I S I O N
**of the Technical Board of Appeal 3.4.01**
**of 16 January 2007**

**Appellant:** Saab Bofors Dynamics AB
SE-691 80 Karlskoga (SE)

**Representative:** Glawe, Delfs, Moll
Patentanwälte
Postfach 26 01 62
D-80058 München (DE)

**Decision under appeal:** **Decision of the Examining Division of the European Patent Office posted 12 July 2005 refusing European application No. 97909817.5 pursuant to Article 97(1) EPC.**

**Composition of the Board:**

**Chairman:** B. Schachenmann
**Members:** R. Bekkering
G. Assi

## Summary of Facts and Submissions

I. European patent application 97 909 817.5 (publication nos. WO-A-98 16848 and EP-A-0 932 839) was refused pursuant to Article 97(1) EPC by a decision of the examining division dispatched on 12 July 2005. The decision was based on the ground of lack of clarity of the claims (Article 84 EPC), on the ground that the invention was not disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 83 EPC) and on the ground that the description mainly related to a scientific theory or mathematical method which was excluded from patentability under Article 52(2)(a) EPC.

II. The applicant (appellant) lodged an appeal against this decision on 1 September 2005. The appeal fee was received on 31 August 2005. The statement setting out the grounds of appeal was received on 3 November 2005.

III. Oral proceedings, requested as an auxiliary measure by the appellant, were held on 16 January 2007.

IV. The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of the following documents:

Claims: No. 1 to 4 filed in the oral proceedings on 16 January 2007;

Description: pages 1 to 10 filed with the statement setting out the grounds of appeal on 3 November 2005;

Drawings: Sheet 1/5 to 5/5 as published.

As an auxiliary request, it was requested to remit the case to the examining division for further prosecution.

V. Reference was *inter alia* made to the following document:

D2: GB-A-2 218 293

VI. Claim 1 reads as follows:

"*1. A method of eliminating strong interferences of short duration in the form of a pulse in a radar unit of the FMCW type with linear frequency sweep, where the transmitted and received signals are combined to form a difference signal as a beat signal, said beat signal being the sum of a number of sine waves, each sine wave representing a radar target, the frequency, amplitude and phase of each said sine wave containing the information about said target, comprising:*
*sampling the beat signal;*
*detecting said interferences in the beat signal and eliminating the samples of the part of the beat signal with said interference in the time domain;*
*reconstructing the eliminated samples by extrapolation based on a plurality of samples of the beat signal without interference immediately preceding and/or following the eliminated samples,*
*wherein said extrapolation is based on linear combinations of samples without interference,*
*wherein FIR filters are used for said linear combinations, and*
*wherein the coefficients in said linear combinations are determined by means of adaptive methods.*"

## Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.

2. *Amendments*

Claim 1 is based on originally filed claims 1 to 5, with the additional features which relate to the nature of the interference being derivable from the paragraph bridging pages 3 and 4 and from page 6, third paragraph of the original description, the specification of the beat signal being derivable from page 2, second paragraph, and the use of immediately preceding and/or following samples being derivable from the paragraph bridging pages 7 and 8 of the original description.

The dependent claims 2 to 4 are based on originally filed claims 2, 7 and 8, respectively.

The Board is thus satisfied that the amendments to these claims comply with the requirements of Article 123(2) EPC.

3. *Clarity and sufficiency of disclosure*

Claim 1 as amended is considered to now provide an acceptably clear definition of the method in particular in view of the definition in the claim of the nature of the interference to be detected and in view of the clarified and more concrete definition of the

reconstruction of the eliminated samples of the beat signal (Article 84 EPC).

As far as the sufficiency of the disclosure of the invention is concerned (Article 83 EPC), the board is of the opinion that the skilled person would be able to detect strong interferences of short duration in the form of a pulse in a typical beat signal of an FMCW radar based on his common knowledge as for example demonstrated by document D2 in which such strong, short interferences in the form of a pulse standing out from the beat signal are detected by their amplitude.

Regarding, on the other hand, the reconstruction of the eliminated samples by extrapolation, the board is satisfied that the skilled person would be able to perform the extrapolation based on linear combinations of samples without interference using FIR filters and wherein the coefficients in the linear combinations are determined by adaptive methods as per claim 1 and the description. As indicated in the description, "*it is possible to predict linearly an FMCW signal using a suitable linear relationship of a suitable order*". This is "*known from adaptive signal treatment, see for example Haykin, Adaptive Filter Theory, 3rd Ed., Prentice-Hall 1996. The coefficients can be determined by the usual algorithms, e.g. LMS, standardized LMS, RLS, etc, see in particular chapters 9 and 13 in the above reference*" (see pages 8 and 9 of the description).

The board in substance concurs with the appellant that the technical competence of the skilled person working in the technical field of radar signal processing at issue is to be considered sufficient to apply the

admittedly quite concise information pertaining to the reconstruction provided in the application.

It is however noted in this respect that, of course, comparable standards of technical competence of the skilled person should be adopted in any assessment of inventive step in the present case.

4. Finally, in the board's view the present application cannot be considered to relate to scientific theories or mathematical methods as such, as the claimed method concerns the field of signal processing and makes use of technical equipment like FIR filters. Only in that case, the patentability would be open to objection (Article 52(2)(a) and (3) EPC).

5. Since the contested decision did not consider the further requirements of the EPC, in particular the requirements of novelty and inventive step, the board considers it equitable under the present circumstances that the appellant be given the opportunity to argue its case having regard to the remaining requirements of the EPC before the examining division, as requested by it.

Therefore, the board, in exercising its discretion under Article 111(1) EPC, remits the case to the examining division for further examination.

## Order

## For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the examining division for further prosecution.

The Registrar: The Chairman:

R. Schumacher B. Schachenmann