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File No.: T 0327/91 - 3.5.1  
Application No.: 82 900 272.4  
Publication No.: 0 067 201  
Classification: HO4N 5/04  
Title of invention: Horizontal phase lock loop for television

**D E C I S I O N**  
of 19 November 1993

Applicant: -  
Proprietor of the patent: Motorola, Inc.  
Opponent: Interessengemeinschaft für Rundfunkschutzrechte  
e.V.

Headword:

**EPC:**

Keyword: "prior use (yes)" - "inventive step (no)" -  
"late filed documents (disregarded)"

**Headnote**  
**Catchwords**



Case Number: T 0327/91 - 3.5.1

**DECISION**  
**of the Technical Board of Appeal 3.5.1**  
**of 19 November 1993**

**Appellant:**  
(Opponent)

Interessengemeinschaft  
für Rundfunkschutzrechte e.V.  
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**Representative:**

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**Respondent:**  
(Proprietor of the patent)

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**Representative:**

Hudson, Peter David  
Motorola Ltd.  
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**Decision under appeal:**

Interlocutory decision of the Opposition Division  
of the European Patent Office dated 19 February  
1991 concerning maintenance of European patent  
No. 0 067 201 in amended form.

**Composition of the Board:**

**Chairman:** P.K.J. van den Berg  
**Members:** R. Randes  
F. Benussi

### Summary of Facts and Submissions

I. European patent No. 0 067 201, claiming priority of 29 December 1980 from US 220 608, was opposed by the Appellant on the ground that its subject-matter was not patentable within the terms of Articles 52 to 57 EPC.

II. The following documents, *inter alia*, were considered in the proceedings before the Opposition Division:

D6: US-A-4 214 260

D8: Valvo Handbuch "Integrierte Analog-Schaltungen für Fernseh-Anwendungen 1980/1981" especially pages 179 to 185;

III. In the course of the opposition proceedings the Respondent (the Proprietor) filed amended independent Claims 1 and 3, granted dependent Claim 2 remained unamended and Claim 3 as granted was deleted. The independent Claim 1 reads as follows:

"A horizontal phase lock loop for use in a television receiver of the type which receives horizontal synchronization pulses at the line frequency and which includes a horizontal output (48) stage for generating flyback pulses; a first loop including a first phase detector (30), an oscillator (34) and a first divide-by-two circuit (38); and a second loop including a second phase detector (40); said first phase detector (30) having a first input coupled to receive said synchronisation pulses, and a second input; said oscillator 34 having an input coupled to an output of the said first phase detector (3) for generating a ramp waveform, said output of said first phase detector altering the frequency of said oscillator; said first

divide-by-two circuit (38) having an input coupled to said ramp waveform for producing a switching waveform, said second input of said first phase detector receiving said switching waveform; said first loop locking said oscillator to said horizontal synchronization pulses, said horizontal phase lock loop being **characterized** by a comparator slicer (36) having first and second inputs coupled for receiving said ramp waveform and a DC bias signal respectively and said first divide-by-two circuit (38) having an input coupled to an output of said comparator slicer (36) to thereby produce said switching signal, said ramp waveform having a frequency substantially equal to twice said line frequency; said second loop locking said flyback pulses to said switching waveform, said second loop further including first means (44) and a second divide-by-two circuit (46); said second phase detector (40) having a first input coupled to said switching waveform a second input coupled to receive said flyback pulses, said first means (44) having a first input coupled to said ramp waveform and a second input coupled to an output of said second phase detector (40) for slicing said ramp waveform and producing an output having a frequency substantially equal to said ramp waveform; said second divide-by-two circuit (46) having an input coupled to the output of said first means (44) and an output coupled to said horizontal output stage (48) for producing a fifty percent duty cycle drive waveform having a frequency substantially equal to said line frequency".

Independent Claim 3 is a method claim which corresponds to Claim 1 in that the functioning of the phase lock loop according to Claim 1 is defined in terms of method steps.

IV. By an interlocutory decision dated 19 February 1991, the Opposition Division decided that the patent in suit could be maintained on the basis of Claims 1 to 3 as amended and a correspondingly amended description. In the decision of the Opposition Division D8 was considered as the most pertinent document, although the Proprietor (now Respondent) expressed reservations as to its validity as prior art, since there were only three months between the date printed on it and the priority date. According to the Opposition Division D8 disclosed that the phase lock loop included two sub loops. They, however, did not represent such phase loops as identified in Claims 1 and 3. The Opposition Division came to the conclusion that the disclosed circuit and the text of D8 was too vague to represent a good basis for the skilled man to realise the invention as claimed.

V. The Appellant lodged an appeal against the Opposition Division's decision. In his statement of the grounds of appeal, the Appellant submitted that the subject-matter of the valid claims lacked if not novelty having regard to the teaching of D8 - then in any case an inventive step having regard to the teachings of D8 and D6.

VI. In reply to a communication pursuant to Article 11(2) of the Rules of Procedure of the Boards of Appeal, the Appellant introduced into the proceedings a data sheet (pages 1 to 9) of "development sample data" for

Philips TDA 2576 A, "Horizontal oscillator combination with vertical 625 divider system", January 1980 (hereinafter identified as D8-II).

The Appellant stated, that in the oral proceedings, appointed on 16 July 1992, he intended to use said data sheet D8-II (which disclosed an arrangement corresponding to the arrangement according to D8), when

it was necessary to refer to the arrangement according to D8.

- VII. The Appellant in his argumentation shows that the horizontal phase lock loop according to D8 and D8-II, in fact, like the one according to Claim 1 also has two (sub-) loops.

Horizontal synchronization pulses are input to a first phase detector (reference numeral 30 according to the present application - boxes "PHASE 1" in Figure 1 of D8-II). The output of this phase detector is connected to an input of an oscillator (34 - box " $2f_H$  OSCILLATOR"). The oscillator generates a ramp waveform which is input to a comparator (44 - box "PHASE COMPARATOR"). Another output of the oscillator is connected to a first divide-by-two circuit (38 - box " $\div 2$ "), the output of which is connected to both the first phase detector (30 - boxes "PHASE 1") and a second phase detector (40 - box "PHASE 2"). The first loop is according to D8-II, Figure 1, thus formed from "PHASE 1" over " $2f_H$  OSCILLATOR" over divide-by two circuit " $\div 2$ " back to "PHASE 1".

Said second phase detector (40 - box "PHASE 2"), which is included in the second (sub-) loop is connected to said comparator (44 - box "PHASE COMPARATOR"), the output of which is connected over a second divide-by-two circuit (46 - the box " $\div 2$ " under the " $\div 2$ " box comprised in said first divide-by two circuit) to the horizontal output (48 - box "HORIZONTAL OUTPUT"). The second loop is closed in the way that the flyback pulses from the horizontal output (10) are input over the terminal 14 to the second phase detector (40 - box "PHASE 2").

The Appellant agrees that the following features of Claim 1

(a) a comparator slicer (36) having first and second inputs coupled for receiving said ramp waveform and a DC bias signal respectively and said first divide-by-two circuit (38) having an input coupled to an output of said comparator slicer (36) to thereby produce said switching signal,

and that

(b) a second input of said first means (44) was coupled to an output of said second phase detector (40) **for slicing said ramp waveform and producing an output having a frequency substantially equal to said ramp waveform,**

cannot be explicitly identified in the arrangement of Figure 1 of D8-II. However, both features are self-evident for the skilled man. The said " $2f_H$  OSCILLATOR" according to D8-II is a ramp-oscillator. As the control of a divide-by-two circuit normally is supplied by a square-wave, it is self-evident that the skilled man uses a DC-voltage as clipping level. The "PHASE COMPARATOR" in Figure 1 of D8-II is also supplied with a ramp waveform and functions apparently also as a "comparator slicer". Moreover, it is common knowledge that a 50% duty cycle is derived from a frequency that is twice the derived frequency.

The Appellant, however, also expresses the opinion, that would the Board not be able to come to the result that the said "comparator slicer" and said "phase shift slicer" were present in the arrangement according to Figure 1 of D8-II, then in any case it would be obvious to a skilled man to arrive at the phase lock loop

according to Claim 1 having regard to the teaching of D6. According to D6, Figure 1, a voltage controlled oscillator 6, corresponding to oscillator 34 according to Claim 1, also provides a ramp waveform of a frequency of twice the line frequency. This waveform is input over a pulse generator 8 to a frequency divider 9, the output of which is connected to an output terminal 4. In the description (column 3, lines 49 to 58; column 4, lines 13 to 18; column 6, lines 25 to 32) the pulse generator 8 is described in the way that it quite clearly corresponds to the comparator slicer according to Claim 1.

VIII. The Respondent (Proprietor) argues in the following way:

It cannot be denied that D8-II discloses two loops. However, it is not clearly disclosed in which way the loops function. It is true that a ramp waveform is supplied from a first output of the " $2f_H$  OSCILLATOR" to the said "PHASE COMPARATOR". However, it is quite unclear what kind of signal is going through the " $2f_H$ -OSCILLATOR" (or which is supplied from the second output of this oscillator) to the first divide-by-two circuit. If the intention of D8-II had been to show that the second output of the " $2f_H$  OSCILLATOR" was generated by a "comparator slicer", then it would have surely been so indicated, as it has been done for the ramp waveform from the first output of said oscillator. Also, D8-II is silent towards the use of a DC bias signal to establish a switching level for a "comparator slicer" to generate a non-symmetrical switching waveform provided at the output thereof. Apparently a square-wave is according to D8-II input directly to the divide-by-two circuit and therefore the phase cannot be changed as according to the invention. It is, thus, in no way disclosed that a "comparator slicer" 36 as according to Claim 1 can be introduced between the " $2f_H$ -OSCILLATOR" and the said



first divide-by-two circuit in the arrangement according to D8-II. Neither is it obvious to introduce a "phase shift slicer" 44 according to Claim 1 into the second loop of said arrangement according to D8-II.

The invention principally solves the problem how to shift the phase between the two loops. By introducing slicers in both loops an extremely great flexibility in controlling the phase shift of the loops in relation to each other has been achieved.

IX. In the oral proceedings the Respondent, moreover, argued in the following way:

The Respondent does not accept D8 as a prepublished document. There is about three months between the date printed on it (only identified as 9.80) and the priority date. It is, however, in no way proved that this internal handbook was made available to the public. If it still was made available to the public, it could appear that the real time-point for making this publication available could have been later than the said printing time, since the title of the book indicates that the "making available to the public" could, indeed, have been later (...Anwendungen 1980/81).

Moreover, it is in no way proved that the Philips data sheets D8-II were made available to the public. On the top of the first page of D8-II it is stated under "DEVELOPMENT SAMPLE DATA" that

"this information is derived from development samples made available for evaluation. It does not necessarily imply that the device will go into regular production".

It appears that this statement indicates that there was no free public availability of the data sheets. Instead,

it appears that the arrangement according to D8-II was still in a development phase and, therefore, of course, had not been made available to the public, but was subject to a secrecy agreement.

The Respondent, therefore, asks the Board to disregard the documents D8 and D8-II. However would the Board still consider these documents as valid references, the Board is asked to take into account the analysis of the technical substance of said documents made by the Respondent under VIII above.

- X. The Appellant requested that the decision under appeal be set aside and that the European patent No. 0 067 201 be revoked.
  
- XI. The Respondent requested that the appeal be dismissed and that the patent be maintained as amended during the proceedings before the Opposition Division.
  
- XII. After deliberation in the oral proceedings the Chairman of the Board invited the Appellant to prove, within a time limit of three months from the date of the oral proceedings, that the Valvo Handbook 1980/81 (D8) and the Philips document (D8-II), filed on 11 April 1992, had been available to the public prior to the priority date in the meaning of Article 54(2) EPC.
  
- XIII. The Appellant has within the given time limit filed an affidavit (eidliche Erklärung) from Dipl.-Ing. Detlef Baumgärtner. In this affidavit Mr. Baumgärtner assures that the Philips data sheet D8-II was received by IGR (the Appellant) on 5 September 1980 without any requirements on secrecy.

The Appellant in an accompanying letter explained that the text at the top of the first page of D8-II (see

under IX above) was not a secrecy requirement, but was intended to protect the delivering firm from later claims on damages, which could arise when the data of the design were to be changed during the last development period. The delivering firm therefore stated in said text that the designed product would not necessarily go into regular production.

The Appellant, however, in said letter regretted that, neither the Appellant, nor the publisher could after so many years produce evidence for the distribution date of the publication D8.

The Appellant also stated that a secrecy requirement from the side of the delivering firm (Valvo or Philips) had in this case not been necessary, as great parts of the arrangement according to D8 or D8-II were already published. Appellant filed the documents

D11: US-A-4 024 343

D12: US-A-4 228 462,

which both were published before the priority date of the present patent and which according to him proved this statement.

XIV. In a further letter the Respondent expressed the view that the said affidavit was from the General Manager of the opponent organisation and, moreover, that the Philips company itself was a member of that organisation. Therefore, this affidavit is related to and is provided by, obviously interested parties to the present proceedings and it cannot be considered as objective evidence of the free public availability of the said data sheet. D8-II should, therefore, be

disregarded as well as D8, about which no evidence has been produced.

Moreover, the Respondent strongly urged that the late filed documents should be disregarded, as they were introduced into the proceedings at "this very late stage".

The Respondent also defended his invention to the substance in relation to D8 and D8-II along the lines as in the previous proceedings (see under VIII above).

Finally the Respondent stated:

"It is strongly submitted that if there is any doubt that a person skilled in the art would clearly and unambiguously derive the patented invention from the cited documents, then this doubt should be exercised in favour of the patentee: if the present appeal is rejected, the opponent has recourse to pursue its arguments in proceedings for revocation which it may bring before the national courts of the states designated in the subject patent, if, however, the present appeal is upheld, the patentee has **absolutely no further recourse**. Therefore, the Appeal Board should exercise its discretion adversely to the patentee **only** if there is no doubt whatsoever.

In conclusion it is requested that the present appeal be rejected. If, however, the Appeal Board should **not** (the bold type introduced by the Board) be inclined to decide adversely to the patentee, the patentee requests the opportunity to present further arguments in oral proceedings before a formal decision is issued."

In the last paragraph, the Board understands that the said word "not" (indicated by the bold type) has inadvertently been introduced to the text.

**Reasons for the Decision**

1. The appeal complies with Articles 106, 108 and Rule 64 EPC and is therefore admissible.
2. The first question to be decided in this case is whether the key documents D8 and D8-II should at all be accepted as prior art documents within the meaning of Article 54(2) EPC.

In the oral proceedings, the Board invited the Appellant to prove that said documents were available to the public before the priority date of the present patent. As has been made clear above (see under XIII above) the Appellant was unable to produce such evidence for D8.

- 2.1 The Board is aware of the fact that D8-II was a late filed document introduced into the proceedings just before the oral proceedings held before the Board. The Respondent did not contest that filing. Also to the Board it appeared that this filing was a logic step taken by the Appellant after the Board's communication pursuant to Article 11(2) of the RPBA, wherein it was said that D8 only schematically disclosed a circuit of the arrangement of TDA 2576 A and the explanation of the functioning of its different components appeared to be very short or lacking. The arrangement of D8-II clearly corresponded to the one of D8. The schematic circuit according to Figure 1 in D8-II was almost identical to the one in Figure 1 of D8, but the data sheet D8-II contained more informative text about the different components than D8.

Thus, apparently D8-II contains more information about said arrangement TDA 2576 A than D8, is more relevant than D8 and should therefore not be disregarded (Article 114 EPC).

- 2.2 The other aspect of D8-II is whether this document was made available to the public before the priority date of the present patent or not, i.e. whether it constitutes prior art within the meaning of Article 54(2) EPC.

The Respondent has expressed the opinion that the evidence provided by the Appellant does not prove that D8-II was made available before the priority date of the present patent, since the affidavit relied upon stems from a person with close relation to the Appellant, i.e. the General Manager of the opponent organisation.

- 2.2.1 Any kind of document, regardless of its nature, is admissible during proceedings, before the European Patent Office. The probative value of any such document, however, depends on the particular circumstances of the particular case in application of the principle of free evaluation of evidence. In this context it is to be noted that the EPC does not rule out the hearing of an employee of one of the parties to the proceedings as a witness (cf. T 482/89, OJ) EPO 1992, page 646 - see reasons 2.1 and 2.2).

Analogically the Board cannot see any reason to disregard an affidavit, even, if it were signed by a General Manager of an appealing company. Moreover, the statement of the Respondent that the document D8-II was produced by the Philips company, "**which is itself a member of the opponent organisation**" has been denied by the Appellant (Opponent).

- 2.2.2 Moreover, the Board sees no reason to doubt the affidavit as to its substance.

It appears that the existence of said document D8-II, as well as that of D8, has never been disputed by the Respondent, who has only contested that said documents were made available before the priority date of the patent. Although the Board formally will not take account of the teaching of D8 when examining novelty and inventive step of the invention, it nevertheless finds that the existence of D8 (a handbook) indicates that also other documents could have been produced disclosing said arrangement TDA 2576 A disclosed therein. In that respect the "publication date" (9.80) printed on the bottom on every page of D8 suits very well with the date given in said affidavit, i.e. that D8-II was received by the Appellant on 5 September 1980. Moreover, the "publication date", printed on the bottom of every page of D8-II, i.e. "January 1980" in no way contradicts that the data sheet D8-II was distributed to the Appellant on 5 September 1980.

The Board therefore takes the view that from different existing publications, disclosing said arrangement TDA 2576 A, the date of reception of document D8-II by the Appellant can be considered to be the 5th September 1980.

- 2.2.3 When considering the circumstances relating to the use, it is observed that in the affidavit it is clearly stated that the Appellant was not bound to any secrecy agreements (point 3 of the affidavit). Moreover, the Board takes the view that said statement on the top of the first page of D8-II (under "DEVELOPMENT SAMPLE DATA" see under IX above) is not a secrecy requirement, but must be interpreted as proposed by the Appellant under XIII above, i.e. this statement is provided in order to

protect the delivering firm from getting claims on damages - would the data of the arrangement disclosed in said document be changed at a later stage.

It, therefore, appears to the Board that there was no bar of confidentiality restricting the use of knowledge disclosed in said D8-II.

It is true that the document D8-II has been proved to be distributed to only one client or interested party of the public. It is, however, "in accordance with principles well-established in the case law of the majority of Contracting States, that a single sale is sufficient to render an article sold available to the public within the meaning of Article 54(2) EPC, provided the buyer is not bound by an obligation to maintain secrecy. It is not necessary to prove that others also had knowledge of said article" (cf. T 482/89, already cited under reason 3). It is the Board's opinion that this principle is also applicable to the present case, as the description of the arrangement TDA 2576 A and the data of the corresponding components were made available to an interested party which was not bound to an obligation to maintain secrecy.

2.3 The Board, therefore, comes to the conclusion that D8-II should not be disregarded, but must be considered when novelty and inventive step of the subject-matter of the patent is assessed.

3. The Board making use of its discretion under Article 114(2) EPC disregards the documents D11 and D12 introduced into the proceedings by the Appellant after the oral proceedings, held before the Board, and considers that in this case these documents have been filed far too late, indeed, after the oral proceedings before the Board have been held (cf. T 534/89, to be published).



4. A horizontal phase lock loop according to Claim 1 is distinguished from the arrangement disclosed by D8-II in that the first (sub-) loop of said phase lock loop includes a "comparator slicer" (36) - identified by feature (a) under VII above - and also in that the phase lock loop includes a "phase shift slicer" (first means 44) - identified by feature (b) under VII above. The Board does not agree to the allegations made by the Appellant that said "comparator slicer" and said "phase shift slicer" would be inherently present or implicitly disclosed in the arrangement according to D8-II. Instead, the Board comes to the result that the subject-matter of Claim 1 is new.
  
5. The Board, however, also comes to the result that the subject-matter of Claim 1 does not involve an inventive step.

It may be that it is possible in the phase lock loop of D8-II to generate a separate square wave type signal (originating from "2f<sub>H</sub> OSCILLATOR) and to input it to the divide-by-two circuit "-/ -2", which is coupled to the output of said oscillator without a "comparator slicer" (cf. under VIII above). However, having regard to the teaching of D6, it appears that it would be quite obvious to a skilled man to use a "comparator slicer" for that purpose and more than obvious to also use such a slicer ("phase shift slicer") as said "PHASE COMPARATOR" disclosed in D8-II.

Said pulse generator 8 according to D6 (see under VII above, last paragraph) clearly corresponds to a "comparator slicer", as has been suggested by the Appellant and, moreover, it is used in a circuit used in the same technical field (line synchronization) as the one of the patent. Thus Figure 3 of D6 discloses that the pulse generator 8 (as well as generators 11 and 15)

receives a ramp waveform from voltage controlled oscillator 6 which by means of a clipping level  $V_1$  or  $V_2$  changes the ramp form into a square waveform, which in turn is supplied to a frequency divider, such as a binary divider. Also in this case the said oscillator produces a frequency that is double the line frequency (column , line 40) and, moreover, the output from the binary divider has a fifty percent duty cycle (Figure 3c and d).

Having regard to this teaching of D6 and the fact that a ramp waveform is already present at (at least) one output of the " $2f_H$  OSCILLATOR", it thus must be quite obvious to a skilled man to introduce into the circuit shown in Figure 1 of D8-II a "comparator slicer" between said " $2f_H$  OSCILLATOR" and said divide-by-two circuit " $\div 2$ " in order to provide a suitable square wave input to the divide-by-two circuit. This obviousness appears to be quite independent on the question, whether the phase of the square wave has to be shifted or not. However, would the intention of the skilled man be to provide a shift in the phase, it must be particularly obvious to him to choose the method disclosed by D6, which discloses this possibility by the change of the clipping level ( $V_1$  and  $V_2$ ).

The Respondent in the oral proceedings before the Board considered that his invention solved the problem how to shift the phase between the two loops. By introducing slicers in both loops he has achieved an extremely great flexibility in controlling the loops in relation to each other. It is true that D8-II does not disclose such control arrangement having two slicers . But it is stated under point 12, page 7 in said data sheet, that it is possible to obtain a phase shift between video and flyback pulse by externally changing a reference voltage supplied to a "PHASE 2 CONTROL" and as well to a "PHASE

1 CONTROL", which apparently control the signal to one of the inputs of the said "PHASE COMPARATOR" and the one to the input of said " $2f_H$  OSCILLATOR" respectively.

Such phase shift by changing the external reference voltage does not appear to prevent the use of slicers. Thus it appears, in fact, that the signal from the output of said "PHASE 2 CONTROL" is controllable and the level of it can be changed. Therefore said "PHASE COMPARATOR" apparently receives a control signal on one of the inputs and receives the ramp waveform on the other input. Having regard to the teaching of D6, it therefore appears to be self-evident to a skilled man to use said "PHASE COMPARATOR" as an additional slicer ("phase shift slicer"). This must be particularly true as the divide-by-two circuit " $\div 2$ " connected to the output of the said "PHASE COMPARATOR" needs a square wave as input.

6. Consequently, the Board concludes that it would be obvious to a skilled man to arrive at the subject-matter according to Claim 1 which subject-matter, therefore, lacks an inventive step (Art. 56 EPC).

Thus ground (a) in Article 100 EPC prejudices the maintenance of a patent containing such claim.

6. The Board rejects the Respondent's request for further oral proceedings before the Board (see under XIV above), since, as a matter of fact, the parties are the same and also the subject of the proceedings are in substance the same as during the oral proceedings already held before the Board (cf. Art.116(1), second sentence). The Respondent has already had an opportunity to present his comments on the grounds and evidence on which this decision is based. This concerns also the said affidavit filed after the oral proceeding and the Board has,

moreover, taken into account the arguments delivered by the Respondent in that respect.

**Order**

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

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

M. Kiehl

P.K.J. van den Berg