

COMMISSIONER'S DECISION

Section 2 of the Patent Act: A method of seismic exploration - Computer Programs

The application relates to a method for processing well logging data employing computer programs. The claims were refused as being directed towards non-statutory subject matter under Section 2 of the Patent Act. It was decided that computer programs expressed in any and all modes, where the novelty lies solely in the program or algorithm are not directed to patentable subject matter.

Final Action: Affirmed.

This decision deals with a request for review by the Commissioner of Patents of the Examiner's Final Action dated July 7, 1976, on application 096,284 (Class 349-19). The application was filed on October 22, 1970, in the name of William Harold Ruehle, and is entitled "Continuous Velocity Estimation." The Patent Appeal Board conducted a Hearing on September 8, 1977, at which Mr. D. Watson Q.C. represented the applicant. Also in attendance was Mr. E. Pascal of the same firm, and Mr. M. Sherback, the United States Patent Agent.

The application is directed to a method of seismic exploration in which acoustic signals are generated, reflected from sub-surface interfaces, and then detected. The detected acoustical signals are translated into electric signals which are then processed to a convenient form using automatic computing apparatus.

In the Final Action the examiner refused the application as being "directed to non-statutory subject matter under Section 2 of the Patent Act..." In that action he had, inter alia, this to say:

...

The present application discloses by means of a flow chart Fig. 3 a process for automatically processing digital data representative of seismic reflections on recorded traces to provide an estimate of acoustic velocity on a general purpose computer. The steps of the process merely set forth a routine of standard computational operations for the solution of a mathematical problem and outputting the data in the desired format (Fig. 5). No technical problem has been encountered and overcome since no particular portion of the computation process has been disclosed in detail. While the term 'program' has not been used in the detailed description of figure 3,

the terms "routine, sub-routine, technique and set of instructions" are used which are programming expressions. The closing statement in the disclosure "While the method of the present invention can be practiced with the use of several well known types of computing apparatus, the method is particularly suitable for use with a general purpose computer." appears under the heading "Computer Program for Carrying Out the Invention". The formal version of this program in the Fortran language appearing in the application as originally filed was cancelled by attorney's letter of May 12, 1972.

The Commissioner's Decision in Re Waldbaum was directed to the claims appearing in Canadian Patent 909,386 pages 4 and 5 of this patent discloses that a new use has been found for computing apparatus. The J register which was formerly used to store an instruction is used by Waldbaum to perform a counting function. Thus the claimed subject matter in Waldbaum is the result of the application of technical skill to apparatus, the specific apparatus being disclosed in a particular environment. In the present application the computer is used to process (seismic) data in the normal manner for which it was designed. The subject matter of the Waldbaum disclosure corresponds to the form of the claims. The substance of the claims of the present application is a program as the disclosure is directed to a programming process.

...

In response to the Final Action the applicant submitted an additional claim (10a) and stated (in part):

...

Applicant's Submission

(a) The claims are not, as held by the Examiner, claims for a computer program.

There is ample jurisprudence in Canada, the United Kingdom and the United States to show that claims directed to processes which may partially or completely be carried out in a computer may be patentable. They are not the same thing as claims to a computer programme per se. Consideration must be given to what is actually claimed to see if what is claimed is a computer programme as a programme, or whether the claims are directed to a process or whether what is claimed is a computer that has been programmed. The applicable legal considerations will depend on the subject matter claimed. It is accordingly submitted to be unsound for the Examiner to base his reasoning on the false premise that what is claimed is a computer programme per se, where this is clearly not the fact.

The leading Canadian decision is the Commissioner's decision in the Waldbaum case reported in the Patent Office Record of January 18, 1972 at page vii.

...

It seems as if the Examiner is seeking to say that the J register of Waldbaum is not, according to the Waldbaum invention, used to store an instruction (that is to say a programme). Somehow Waldbaum performs a counting function without a programme. Surely he needs a programme to perform a counting function. Then when the Examiner speaks of the claimed subject matter in Waldbaum being the result of the application of technical skill to apparatus, he is evidently looking at some only of the Waldbaum claims. As has been pointed out above, the Waldbaum case included process claims which were specifically held by the Board and the Commissioner not to be for a computer programme per se and not to be contrary to Section 2 of the Patent Act. When the Examiner says that Waldbaum's specific apparatus is disclosed in a particular environment he is overlooking the fact that the claims of Waldbaum are not limited to a particular environment. However, applicant's claims in this case do bring the environment of seismic exploration as part of the claimed subject matter. Therefore, if the inclusion of the environment is significant to patentability as contended by the Examiner, applicant in the present application complies with this. Applicant's claims should be more readily acceptable than those of Waldbaum. Applicants have defined in their claims the particular technology and particular end use of their process whereas, contrary to the Examiner's contention, Waldbaum did not.

Certainly, therefore, the Examiner has not pointed out any logical reason for applicant's claims to be unpatentable on the assumption that, as held by the Commissioner and the Board, the Waldbaum process claims are patentable.

The Examiner then states:

"In the present application the computer is used to process (seismic) data in the normal manner for which it was designed".

This is not true. If an analog computer is used to perform applicant's invention then it will have to be specially designed for that purpose in accordance with the teaching of applicant's invention. If a general purpose computer is used to carry out applicant's invention then it must be appropriately programmed. When so programmed it will operate in accordance with the programme....

...

On August 8, 1977, the applicant submitted an affidavit, in the name of Mr. James N. Galbraith, which provides a comprehensive technical framework for an understanding of the background and "nature of the invention." We will comment on this later.

At the Hearing Mr. Watson argued vigorously that, in his view, the claims were indeed directed to patentable subject matter. The pertinent jurisprudence was discussed thoroughly and great reliance was placed on it as support for allowance of the claims. It was argued that: "There is ample jurisprudence in Canada, the United Kingdom and the United States to show that claims directed to processes which may partially or completely be carried out in a computer may be patentable." He also relied upon and placed heavy emphasis on a previous decision of the Commissioner of Patents on computer programs, viz. the "Waldbaum Decision" (CPOR January 18, 1972 at page V11).

In the Waldbaum case it has been argued, where ingenuity is present, that:

1. Claims to a computer program per se are not patentable;
2. Claims to a new method of programming a computer are patentable; and
3. Claims to a computer programmed in a novel manner are patentable.

In view of more recent developments in the patent law as it affects computer programs, we think it now important to reassess those conclusions. To clarify the uncertainties which developed since Waldbaum is indeed difficult because there has been so much litigation in many different countries, unfortunately not always with consistent results.

We believe some general explanations are in order before we proceed with our consideration of the problem before us.

A computer program may be thought of as that portion of computer ware which may be written or printed on paper in an alphanumeric source language, magnetically recorded on tapes, or used with punch cards in computer acceptable form. In other words it provides the wording directions for the computer hardware.

A computer for our purposes is a device which is programmed to carry out a specified series of steps, but generally speaking it is the hardware itself which is usually referred to as "the computer," or "computing apparatus."

An algorithm is, in general, a set of rules or processes for solving a problem in a finite number of steps.

In our view the basic reason why the program itself is not patentable is that a program is analogous in form to printed or design matter, and if the novelty lies solely in the intellectual connotations of the printed or design matter, it is not patentable. On this point we refer to British Petroleum Co. Ltd.'s Application, Official Journal of Patents, (1968), where it was stated:

"...the intellectual content of a punched tape [computer program] is clearly not patentable...."

What happens in the main is that a typical program-related application poses a problem. It describes the development of an algorithm to solve that problem, converts the algorithm to a computer program per se, and then the claims are couched or clothed in obscure language designed to ward off objections that the application is directed to an algorithm or computer program. In our view the development of algorithms and computer programs, however difficult, is nothing more than the expected skill of a programmer and therefore not patentable. Assuming arguendo that a programmer has used his creative skill in designing a specific unobvious program, the novelty lies solely in the intellectual connotations of the printed matter and is not, in our view, patentable. Many matters involving great creativity are just not encompassed by Section 2 of the Patent Act.

In view of the fact that the Waldbaum decision, supra, was predicated on some of the earlier United States decisions we find it appropriate to discuss these now. Particularly since Section 2 of the Canadian Act is similar to and is

based upon the corresponding Section 101 (Code 35) of the United States Patent Act. The history of the treatment in the United States of computer programs/algorithms can be followed from the numerous court decisions on the subject, among which we find the following:

(1) In re Prater and Wei- (159 USPQ 583) 20 Nov. 1968. Claims defining essentially an algorithm were allowed since the US/CCPA (Court of Customs and Patent Appeals) held that as the law did not require a machine to act upon physical substances to be patentable, it was not consistent to impose such a requirement upon a process. Patent protection could not be denied simply because process claims could be read on a process carried out in the mind by the use of such aids as pencil and paper. The court held that so long as a sequence of steps capable of being performed without human intervention and directed to an industrial technology were disclosed, claims could be allowed even if they also read on a mental method.

(2) In re Prater and Wei (162 USPQ 541) 14 Aug. 1969. The US/CCPA held that apparatus and process claims broad enough to encompass the operation of a programmed general-purpose digital computer are not necessarily unpatentable; once a program has been introduced, the general purpose computer becomes a special purpose computer, which, along with the process by which it operates, may be patented subject to requirements of novelty, utility and nonobviousness. The disclosure of apparatus for performing a process wholly without human intervention shows that the disclosed process does not fall within the "mental steps" exclusion.

(3) In re Bernhart and Fetter (163 USPQ 611) 20 Nov. 1969. The US/CCPA held a machine programmed in a new and unobvious way is physically different from a machine without the program. It is

improper to hold that if novelty is indicated by an expression which is not in a statutory class, then the whole invention is non statutory since all else is old. The court cannot deny patents on machines merely because their novelty may be explained in terms of mathematical or physical laws.

- (4) In re Benson and Tabbot (169 USPQ 548) 6 May 1971.

The US/CCPA rejected the contention that a data processing method was non patentable subject matter on the ground that the programmable computer was merely a tool of the mind and the method was basically mental in character. A data processing method was not considered non statutory where it consists of steps which can be carried out by machine implementation as disclosed in the specification. The process had no practical use other than in a digital computer.

- (5) Gottschalk(Commissioner of Patents) v. Benson, 20 Nov. 1972, (175 USPQ 673) U.S. Supreme Court.

Although the reasons for judgments in this case are not too definitive we find that the U.S. Supreme Court held that since the mathematical formula involved had no substantial practical application except in connection with a digital computer, a patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself. In other words the claims are not limited to a particular novel apparatus and are not confined to a specific end-use of field of technology. Since one may not patent an idea the U.S. Supreme Court in effect overturned the US/CCPA decision In re Benson and Tabbot (169 USPQ 548).

- (6) In re Christensen (178 USPQ 35) 31 May 1973.

The claims were directed to a method of determining the sub-surface porosity of an earth formation in situ. Data was gathered from a borehole and processed in a digital computer according to applicant's algorithm. The US/CCPA held that claims to a method including known and necessary data gathering steps and a final step of solving a mathematical equation were directed to non statutory subject matter.

- (7) In re Johnston (183 USPQ 172) 19 Sept. 1974.

The claims were directed to a computer system which kept track of classes of transactions and grouped and printed out such transactions on a customer statement. The US/CCPA held that the claims were not for a method of doing business, nor would the claims restrict others from using the algorithm. The U.S. Patent Office appealed to the Supreme Court in Dann v. Johnston (of the following decision).

- (8) Dann v. Johnston (189 USPQ 257) 12 May 1975.

The U.S. Supreme Court overturned the US/CCPA. The claims were held to be obvious in view of prior art, which was the normal manual methods of record keeping. The Supreme Court however, refused to address itself to the question of non statutory subject matter.

- (9) In re Chattfield (191 USPQ 730) 18 Nov. 1976.

The claims were directed to a method including gathering data for a predetermined time, evaluating data, and controlling a computer to selectively process one of several programs. The CCPA held that the claims were not directed to a particular algorithm or program and that the algorithm was incidental. The claims were held patentable, but two of the five judges registered strong dissenting opinions, relying on Gottschalk v Benson, supra.



- (10) In re Noll (191 USPQ 721) 18 Nov. 1976.

Apparatus claims were directed to scan converting to the taped data by means of a computer and reading out the converted data to raster scan a CRT (cathode ray tube). The sole novelty resided in the program for converting in the computer. The CCPA held that the claims were to apparatus in a particular technology and did not pre-empt the algorithm. The CCPA held here, as well as In re Chattfield, that it was improper to dissect a claim to find what is novel, then if such novel portion was unstatutory to reject the claim. Again two of the five judges dissented vigorously.

- (11) Re Noll and Re Chattfield (cf above).

The U.S. Patent Office attempted to appeal both cases, but was denied a writ of certiorari due to elapsed time limits, and withdrawal of one party.

- (12) In re Deutsch (193 USPQ 645) 5 May 1977.

The claims were directed to a method of operating a system of manufacturing plants, utilizing a programmed computer. The CCPA decided that the program was incidental and the claims were allowable. The claimed invention was held to not pre-empt a mathematical formula, algorithm or program per se when considered as a whole.

- (13) In re Waldbaum (194 USPQ 465) 28 July 1977.

This dealt with the U.S. counterpart to the Canadian Waldbaum application. Similar claims were first allowed by CCPA prior to the Gottschalk v. Benson case but then the CCPA reversed itself and held that the claims would in effect be claims to the algorithm itself.

- (14) In re Flook (195 USPQ 9) 4 Aug. 1977.

The claims were directed to a method whereby a computer was programmed to process data from a catalytic hydrocarbon process, and periodically reset alarm levels. The claimed method consisted basically of the steps of reading parameters, calculating new alarm values, and adjusting the alarm limits. The CCPA held that the post algorithm solution activity of adjusting the alarm limits removed the claims from the category of claiming an algorithm to merely using the algorithm.

The U.S. Patent Office has obtained a Writ of Certiorari from the U.S. Supreme Court to review this decision (Parker v. Flook No. 77-642 Nov. 1977).

- (15) In re DeCastelet (195 USPQ 439) 6 Oct. 1977.

The claims were directed to a method of generating curves from data supplied to a programmed computer. The computer output could be used to control a drafting or milling machine. There was no recitation of a specific algorithm, equation, or formula but an algorithmic process was involved. The CCPA held that post algorithm solution activity must show the method only uses an algorithm and does not pre-empt it. It was held that the claims only defined the processing of data and not merely the use of equations as one step in achieving some other result. The computer in the claimed method only transmitted electrical signals representing results, and this was not considered to be the type of post-algorithm solution activity needed to overcome Gottschalk v. Benson.

- (16) In re Richman (195 USPQ 340) 6 Oct. 1977.

The claims were to a method of determining radar boresight calibration and velocity vector determination. The claims included a novel data

gathering step and a final step of solving a mathematical equation. the CCPA held that the novel, and necessary, data gathering steps did not make the method patentable. It was also held that whether the claimed method was essentially a mathematical calculation was decisive even if it was expressed in words rather than formulae.

It can be seen that, prior to the U.S. Supreme Court decision in Gottschalk v. Benson, the CCPA was developing a position that computer programs and algorithms were statutory subject matter for a patent, provided that they were directed to a particular technology and limited to machine processing, and met the requirements for novelty and unobviousness. This position was based largely on the argument that a general purpose digital computer programmed in a particular way was a different machine from a computer not so programmed. The position of the CCPA following Gottschalk v. Benson then appeared to develop along the lines that claims to an algorithm were to statutory subject matter provided that:

- (a) the algorithm was incidental to the claimed method; and
- (b) there was some post-algorithm solution activity which showed that the algorithm was merely used and not pre-empted.

This position was further amplified to exclude the mere outputting of data to known user apparatus, from the type of post solution activity envisaged. Old or new necessary data-gathering steps were also excluded as a type of activity which would confer patentability upon a claim including an algorithm.

The present position of the CCPA may be summarized as follows:

Claims which are essentially directed to a mathematical calculation or which describe an algorithmic process and which effectively pre-empt the algorithm are directed to non statutory subject matter, unless such claims include post algorithm solution activity which shows that the algorithm is merely being used. Data gathering steps and the outputting of data to known user devices do not convert the claims to patentable form.

We wait with interest, however, the outcome of the U.S. Supreme Court decision In re Flook. If that Court follows what we understand to be the rationale of their previous decisions In re Benson, supra, the CCPA would, we believe, be overruled.

Several appeals to the U.K. Patent Appeal Tribunal have established the U.K. position on the allowability of algorithms or computer programs.

(1) Badger Co. Inc's Application 1970 RPC 36 at p.40 27 Feb. 1968.

Applicants claimed a method of mechanically designing and forming a visible drawing illustrating a piping system wherein data was fed to a computer and the computed data was finally converted into a visible drawing using known apparatus. The Patent Appeal Tribunal held that the claim was not framed in an appropriate manner to fall within the meaning of the Act, but that claims of a certain form might be allowable. The Tribunal therefore looked to the form of claim rather than the substance. Claims of the form appearing in the Canadian Waldbaum patent, was the eventual result.

(2) Slee and Harris Applications (1966 RPC 194) 25 Nov. 1965.

Applicants claimed a method of operating a computer in a program entailing a number of operations, characterized in that one operation was initiated before the previous one was finished. The patent office objected that this was not a manner of new manufacture. The

Patent Appeals Tribunal held that claims in the form of "a computer when programmed to operate" as above, and "means for controlling a computer to operate" as above would be allowable. Thus the Tribunal directed its attention to the form of claims rather than the substance. This resulted in the allowance of claims of the type eventually appearing in the Canadian Waldbaum application.

(3) Gever's Application (1970 RPC 91).

The main claims were directed to a method of preparing mechanically an index of word trade marks using punched cards. The application was refused as being to a scheme or plan which was not statutory subject matter. The Patent Appeal Tribunal held that claims to a means for controlling a computer to carry out the above process were unpatentable. The form of the claims was again decisive.

(4) Burroughs Corp. Application (1974 RPC 147) 30 July 1973.

A method of transmitting data over a communications link between a central computer and peripheral computers. The claims were refused as non-statutory. The Patent Appeal Tribunal held that if a claim was clearly directed to a method for using a computer modified by a program to operate in a new way, it was statutory, and that computer programs when embodied in physical form are proper subject matter for a patent. So long as the program is couched in terms of means it is allowable.

It is clear that in the U.K. if claims to algorithms and computer programs were drawn up in a particular format, they were considered to be allowable. We, however, are not satisfied that the applicability of the British jurisprudence is controlling as regard to subject matter under Section 2 of the Patent Act in Canada (vide, Hoffmann-LaRoche v The Commissioner - 1955 - S.C.R. 414 and

Tennessee Eastman v The Commissioner - 1972 - 8CPR, 202). We also note that the Canadian Patent Act was not modelled after the British Act.

In addition to considering the legal requirement to follow British jurisprudence, the desirability of doing so should also be considered. In this regard a British Committee to examine the patent system and patent law (the Banks Report Cmnd No. 4407) stated in 1970:

A computer program in the sense of a set of instructions for controlling the sequence of operation of a data processing system, in whatever form the expression is presented, e.g. a method of programming computers, a computer when programmed in a certain way, and where the novelty or alleged novelty lies only in the program, should not be patentable [emphasis added].

Furthermore, we find that the new British "Patents Act" 1977, Chapter 37, Part 1(2) refers to things which "are not inventions", and reads:

- c) a scheme, rule or method for performing a mental act, playing a game or doing business, or a program for a computer [emphasis added];
- d) the presentation of information; ...

The continental European jurisdictions generally deny computer applications. For example, the Austrian courts have been confronted with program patents and applications in three cases, all of which were rejected (see, for example, Austrian Patent Office Appeals Division, Dec. 12, 1967-1968 0 Pat B1.39). The French Patent Laws of 1970 exclude computer programs explicitly from patentable subject matter. In Switzerland and The Netherlands, software is dismissed as a "mental process" (see, for example, Swiss Federal Supreme Court "Dimensional Synthesis", December 12, 1972, 5-11C 448, 1974). Germany does, however, allow some form of claims involving computer programs.

In article 52(2) c) and d) of the "Convention on the Grant of European Patents," we also find substantially identical restrictions as in the British Act, supra.

Among the common law countries, Australia is an outspoken opponent of patent protection for computer programs. That attitude is reflected in its decisional law. In all three decided cases (see for example, N.V. Philips Gloeilampenfabrieken, 36 Official Journal of Patents, Trademarks, and Designs 2392 [1966]), patentability was denied. The practice there represents the approach recommended by the "Banks Report," supra. They were concerned with the only novelty being the mode of operation and the restraining effect on the owner of a computer to use it in the most efficient way, after having invested large sums of money in its acquisition.

In Canada itself the Economic Council has reached the conclusion that "patent protection of computer programs would not be appropriate" (Report on Intellectual and Industrial Property, Jan. 1971, p.103). That was reflected in the Departmental Working Paper on Patent Law Revision, June 1976, which at p.180 sought to ensure that "all avenues for obtaining patent rights over computer programming techniques will be closed" (emphasis added).

As mentioned before, at the Hearing Mr. Watson placed heavy emphasis on the earlier Canadian Waldbaum decision, supra. We must remember however, that the Waldbaum decision allowed claims directed essentially to an algorithm or computer program, relying principally upon the U.S./CCPA decision In re Bernhart and Fetter. Subsequent U.S./CCPA and U.S. Supreme Court decisions severely limited the holding In re Bernhart and Fetter. For example, the U.S. Supreme Court in Gottschalk v Benson, supra, found, inter alia, that patents for processes applying scientific principles or ideas have been upheld only when: (1) the process was carried out with a specific apparatus devised to implement the newly-discovered idea, and (2) the claim to a monopoly was confined to a specific end-use or field or art or technology. Because the claims in that decision were not limited to a particular novel apparatus and to a particular end-use technology, the U.S. Supreme Court held that they amounted to claims to the algorithm itself and thus were unpatentable under 35 U.S.C. 101. In

that decision it was also argued that a process patent must either be tied to a particular machine or apparatus, or must operate to change articles or materials to a "different state or thing." Furthermore, as noted, the counterpart of Waldbaum in the United States was refused, the second time around, by the CCPA itself.

It is also settled law in Canada that where a patentable advance has been made in some technical art in the form of an idea or concept, then the claims may take the form of a novel practical embodiment of the idea or concept. (vide, Canadian Gypsum Co. Ltd. v Gypsum Lime (1931) Ex. C.R. 180 at 187). This embodiment must, of course, be described in the disclosure. But the exclusive right granted must be limited to embodiments of the idea or concept, or invention that was made (vide, Farbwerke Hoechst A.G. v Commissioner of Patents (1962) 22 Fox Pat. C. 141 at 169). In other words the claims must characterize the invention made while defining the limits of the monopoly grant.

In response to the Final Action there is an argument (see above) based on Waldbaum, supra, which assumed that to be a binding precedent. Mr. Watson referred to it as "the leading Canadian decision!" We, however, are not satisfied, for the reasons given earlier, with all aspects of the Waldbaum decision because of more recent jurisprudence. For example, we are not satisfied that programming a computer in a particular way produces a new computer or indeed changes the computer in any way. It merely creates a temporary condition. A computer is inherently capable of performing a number of operations and in a particular sequence. No program can make a computer do something which it is not inherently capable of doing, because it is evident that general purpose digital computers are designed so that they are capable of responding to any program that can be devised to operate within the physical restraints of the machine. This is in fact the rationale in designing general purpose digital computers. Generally speaking



programs are a kind of product that any competent programmer could produce, as a matter of course, using his normal skills. When a new program is produced nothing but intellectual information has been added to what previously existed. In our view any claim directed to it is not patentable, irrespective of whether the claim is directed to written instruction on how to operate a machine, or to an information carrier.

Section 2 of the Patent Act provides for a patent to be issued to one who invents subject matter that comes within one of five concrete statutory classes: art, process, machine, manufacture or composition of matter. It might appear from this language that any development that could possibly be characterized as a method of doing anything would be statutory subject matter. But under Section 28(3) of the Patent Act certain types of developments (for example, mere scientific principle or abstract theorem) have never been considered as patentable subject matter. An algorithm, as mentioned is a set of rules or processes for solving a problem in a finite number of steps, and in general can be equated to an abstract theorem.

It is clear however, that where an invention has been made in "a process control system," where a program is merely an incidental part of the system, it will not be objectionable. In a process control system you must however, have novel apparatus tied to a computer which controls a function at the end of a computer. In such a case the invention is not predicated solely on the novelty of the program.

We would like to discuss Mr. Watson's submission of January 4, 1977, the affidavit referred to earlier and the points raised at the Hearing. It is stated that the invention is concerned with a method of seismic exploration "and is not a computer program per se". However, the method of processing data in a digital computer is in reality a computer program, or if broadly defined is an

algorithm. A knowledge of geophysics was required to define the problem and the mathematical relationships between the various parameters, but to go from there to an algorithm or program is the task of a program analyst, and involves the normal expected skill of such a person.

Mr. Watson argued that "a claim directed to the process clearly is not a claim to a program." This argument rests on the assumption that the term "computer program" is limited to the actual series of steps that ultimately control the computer. "Computer Program" also includes broad statements of the method used to solve applicant's problem. Perhaps it would be clearer if when making a rejection the terms "computer program" and "algorithm" were used together, since the dividing line is hazy.

At the Hearing Mr. Watson dealt in full with the pertinent British jurisprudence which we maintain is not applicable in defining Section 2 of the Canadian Patent Act. Furthermore, that jurisprudence may now not be persuasive in view of the changes made in the new (1977) "British Patents Act," supra. In addition Mr. Watson discussed other jurisprudence, especially the pertinent United States cases which we have commented on, supra.

It is explained in the affidavit that the process may be implemented using a "special purpose analog apparatus." The author then goes on to show (Figure 10 of the affidavit) and discuss a suitable analog apparatus. The applicant states, page 6 of the submission, supra, that, "If an analog computer is used to perform applicant's invention then it will have to be specially designed for that purpose in accordance with the teaching of applicant's invention." The flow charts of the specification, however, are merely a definition of the idea of how to carry out the method. Section 36(1) however, requires a full, clear, concise and exact disclosure to allow any person skilled in the art to make and use the invention. It is not in our view adequate disclosure

to merely disclose an idea and a general purpose computer program, and then to say it could be done by specific apparatus. We will have more to say on this point when we discuss the claim pertinent to it.

We previously pointed out that in the Waldbaum case it has been argued, where ingenuity is present, that:

1. Claims to a computer program per se are not patentable;
2. Claims to a new method of programming a computer are patentable; and
3. Claims to a computer programmed in a novel manner are patentable.

To state our position now, taking into account the developments since Waldbaum, it is:

1. Claims to a computer program per se are not patentable;
2. Claims to a new method of operating a computer are not patentable;
3. Claims to a computer programmed in a novel manner, expressed in any and all modes, where the novelty lies solely in the program or algorithm, are not directed to patentable subject matter under Section 2 of the Patent Act;
4. Claims to a computing apparatus programmed in a novel manner, where the patentable advance is in the apparatus itself, are patentable; and
5. Claims to a method or process carried out with a specific novel apparatus devised to implement a newly discovered idea are patentable.

We strongly recommend the above criteria be adopted by the Commissioner of Patents.

As mentioned before the applicant states that his "invention is concerned with a method of seismic exploration in which acoustic signals are generated, reflected from sub-surface interfaces and then detected." We are left, however, with the question whether the subject matter of the claims is patentable under Section 2 of the Patent Act.

We will now consider the individual claims in the light of our principal conclusions. We agree with the examiner, and for the reasons given, that the claims rejected in the Final Action fail to define patentable subject matter. We will however, discuss the claims and apply the reasons for refusal directly to them.

Claim 1 reads:

In seismic exploration wherein values at periodic sampling times on a set of seismic traces represent the reflections of seismic energy produced from a plurality of spaced signal sources and reflected from subsurface interfaces, a method comprising:

generating in a computer an index set of parameters representative of travel time curves for the zero offset sampling time in said set of seismic traces,

detecting reflections in said traces along said travel time curves for different, iterated, zero offset sampling times, and

generating in the computer signals representative of the acoustic velocity associated with each curve in said set for different, iterated, zero offset sampling times.

This claim is directed to a method comprising a series of operational steps characterizing the performance of the method. Even assuming that the applicant's "seismic exploration idea" reflects an inventive contribution the setting, nevertheless, of this idea (itself unpatentable) in our view does not meet the requirements for patentable subject matter under Section 2 of the Patent Act. The claim is not tied to a specific novel apparatus devised to implement the new idea. Whatever novelty is present lies solely in the program or algorithm, and the product is merely intellectual information. In short a method for programming a computer is not directed to patentable subject matter. This claim, in our view, should be refused. Claims 2 to 11 are also method claims and the same arguments apply equally to them and these claims should also be refused. If these methods were carried out with a specific novel apparatus devised to implement the "new idea" then the claims would be patentable providing the "new idea" represented a patentable advance in the art.

Claim 10A, which was submitted on January 4, 1977, is expressed in apparatus form. Claim 10A reads:

An apparatus for seismic exploration wherein signals representative of traces of the reflections of seismic energy are produced from a plurality of spaced sources and subsurface interfaces, comprising:

means for storing for each trace signals a control function representative of the acoustic velocity characteristic of the earth for different, iterated, zero offset sampling times;

means for detecting reflections in said signals for different iterated, zero offset sampling times and for different acoustic velocities;

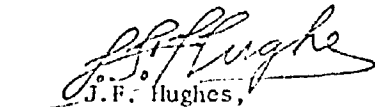
means for selecting the acoustic velocity associated with the maximum detected reflection in the foregoing step, and

means for plotting the alpha numeric representation of the selected acoustic velocity upon a distance-time plot representing said subsurface interfaces.

This claim calls for apparatus including means for storing the data, a data processing unit and means adapted for plotting the latter. It appears that the applicant is attempting to claim a novel practical embodiment of his idea. Any novel practical embodiment must however, be described in the disclosure. The specification does not in substance disclose a specific and novel computer. The fact that a specific analog computer is shown in the affidavit dated July 25, 1977 is of no consequence. If, indeed, the claimed computer is physically different from all previously known computers, then the specification is singularly reticent about stating that fact, and explaining where the physical difference lies. It seems that in an effort to overcome the objection that a method of programming a computer is not patentable, the emphasis in this claim was shifted to the computer itself, only to meet the equally fatal objection that the specification does not really describe a computer, and that any computer mentioned in the specification, as distinct from being "fully described," is not, and has nowhere been stated to be, a novel computer. This claim, in our view, should be refused.

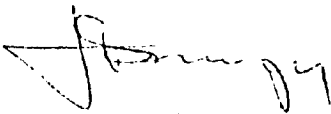
To summarize, we are not satisfied that claims 1 to 11 and 10A are directed to patentable subject matter under Section 2 of the Patent Act. Further, we fail to find any subject matter of a patentable nature in the application. We recommend that the application be refused.

After this decision was completed an article of interest was brought to our attention. It is entitled "Model Provisions on the Protection of Computer Software," at page 259 f.f., in the 1977 December issue of "WIPO Activities." It is the result of six years work carried out by the International Bureau of WIPO with the assistance of experts. The Bureau considered the question of an international treaty for the protection of computer software. Such a treaty could provide for a minimum level of protection for computer software and a system of recognition of the effects of an "international registration or deposit of computer software" by the Contracting States. The purpose of the deposit or model provisions is to afford a proper form of protection for computer software.



J.F. Hughes,  
Assistant Chairman  
Patent Appeal Board, Canada

I have studied the prosecution of this application and carefully reviewed the decision and the recommendations of the Patent Appeal Board. I agree with the recommendations of the Board. Accordingly, I refuse to grant a patent on this application. The applicant has six months within which to appeal my decision under the provisions of Section 44 of the Patent Act.



J.H.A. Gariépy  
Commissioner of Patents

Dated at Hull, Quebec

this 28th day of February, 1978