EXHIBIT A

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA,
ATLANTA DIVISION

CAMBRIDGE UNIVERSITY PRESS, OXFORD UNIVERSITY PRESS, INC., and SAGE PUBLICATIONS, INC., Plaintiffs, - *v.* - MARK P. BECKER, in his official capacity as Georgia State University President, et al., Defendants.	Civil Action No. 1:08-CV-1425-ODE

EXPERT REPORT OF ROBERT B.K. DEWAR
IN RESPONSE TO THE REPORT OF KENNETH D. CREWS

I. Scope of This Report

I have been retained by the law firm of Weil, Gotshal & Manges LLP, counsel for the Plaintiffs in this action. I have been asked to analyze and offer my opinion on certain technical aspects of the operation of the "ERes" (electronic reserve) and "uLearn" systems at Georgia State University (GSU). Particularly, in response to the Report of Kenneth D. Crews, I have been asked, as a technical expert, to identify whether, in the process of distributing course materials through these computerized systems, additional copies of the course materials are made, and to describe how and where these copies are made.

Dr. Crews takes the position that the provision of course materials through ERes is essentially the equivalent of putting those materials on hard-copy reserve in the library.[1] However, unlike traditional hard-copy reserves – where a single copy of a work is placed in a reserve area in the library – the provision of course materials through ERes or uLearn entails the distribution of a copy of the reading material to each and every student in the class who accesses the material online. This activity is, from a technical standpoint, therefore more akin to the use of coursepacks distributed to students than traditional hard-copy reserves. The following sections explain the basis for this contention.

After describing my qualifications, I briefly discuss the ERes and uLearn systems used to distribute copyrighted material in electronic form at Georgia State University. I then describe from a technical point of view how PDF (portable document format) files work, and how copies of such files are necessarily created in the distribution of course reading materials at GSU through the above-mentioned systems.

II. Background and Qualifications

I am President and CEO of Ada Core Technologies, a leading provider of commercial software solutions for the Ada programming language. I founded Ada Core Technologies in 1994. From 1976 to 2005, I was Professor of Computer Science at the Courant Institute of Mathematical Sciences, New York University ("NYU"). I served as the Director of Graduate Studies at NYU from 1976-1977, Chairman of the Computer Science Department from 1977-1980, Director of Undergraduate Studies for the Computer Science Department from 1981 to 1987, and Associate Director of the Courant Institute of Mathematical Sciences from 1994 to 1997. Prior to joining NYU, I was an Associate Professor of Computer Science at the Illinois Institute of Technology ("IIT") from 1970 to 1976, and an Assistant Professor of Information Science at IIT from 1968 to 1970. I received my Bachelor of Science degree from the University of Chicago in 1964, and my Ph.D. in Chemistry from the University of Chicago in 1968.

I have over 40 years of experience in computer programming and software development, particularly in the area of programming languages and compilers. I have taught undergraduate

[1] *See* Expert Report of Kenneth D. Crews at 8 ("E-Reserves are essentially a technological enhancement of 'reserve-room' services that have been part of familiar [*sic*] in education for many decades.").

and graduate courses on many computer science subjects, including computer programming, operating systems, microprocessor architecture, formal language theory, computation theory, and compilers. I am also experienced in developing scientific and commercial software programs. I founded Ada Core Technologies based on Ada compiler technology I developed during my research.

My current curriculum vita is attached to this report as Appendix A, which includes a list of my software- and computer-related experience and publications, as well as my experience serving as an expert witness on computer-related issues in other litigations.

I am being compensated for my time spent performing the analysis that is presented in this report at a rate of $450 per hour. My opinions are objective, and my compensation is not dependent on the outcome of this litigation. A complete list of materials I relied on and considered is attached as Appendix B.

III. Distribution of Course Readings in PDF Format at GSU

Georgia State University provides for students what it refers to as an "electronic reserves" system. The university makes use of the ERes system from Docutek for this purpose.[2] This system allows instructors or personnel of the library to scan in course reading material (usually excerpts of books and journals), make those excerpts available to students in portable document format (PDF), and then disseminate these documents to students registered in the course for which the documents are placed on the reserve system. Students view the material though their internet web browsers by visiting the ERes page on the GSU website, searching for the pages where materials for their particular courses are made available, and clicking on hyperlinks to the reading materials. When they click these links, they are able to view the reading material in PDF format on their computer screens and, if they choose, save the material to their computers and print out copies.[3]

[2] A description is available at www.docutek.com/products/eres/index.html.

[3] The summary of the basic functions of the ERes and uLearn systems is taken from my review of the depositions of James Palmour, Laura Burtle, Paula Christopher, and Jason Reifler, as well the Docutek website, screenshots of the system contained in the Plaintiffs' complaint, and stipulations reached between the Plaintiffs and Defendants.

In addition to the electronic reserve system, professors can access ULearn, a general software system (commonly known as a "course management system") for supporting a professor in a course and allowing a wide range of communication of information of all kinds to students. Of particular relevance here is uLearn's capability to allow users to upload materials to a class page, including music, movies, and documents such as PDF files of scanned copyrighted reading materials. As noted in the deposition of GSU's Paula Christopher, the university supports this system, which allows professors to upload their own material, and strongly encourages professors to make use of it.[4] There are no uploading restrictions of which I am aware other than a file size limit; this would not in practice pose any limitation for PDF files, which could in any case be split into separate chapters. I understand that large amounts of materials are placed on the two systems, and that a single course can have dozens of excerpts from separate books.

IV. Viewing Course Readings via ERes and uLearn Entails the Creation and Transmission of Copies

A. Portable Document Format (PDF)

Portable Document Format (PDF) is a well established digital file format for the transfer of printed page information in digital form (much as MP3 is a format for transfer of music in digital form). A paper document can be converted to PDF form using a device called a scanner and associated software. This is a straightforward transformation that does not involve any significant changes to the text, but rather just a transfer from one format to another. An analogy would be copying an analog vinyl recording of music into digital form and storing it on a CD. In every respect, a PDF of a paper document is essentially an exact copy of that document.

PDF files have an advantage over proprietary formats (like Microsoft Word) in that they can be read by a wide variety of software – not just the software used to create them. For example, the Apple Application Store offers over a dozen applications that allow one to download and read PDF files on an iPhone. Virtually all computer systems have mechanisms for reading and handling PDF files, and the format was created specifically with the purpose of being widely distributable and widely accessible. The most common program for doing so is Adobe Acrobat Reader, which is widely distributed free of charge.

[4] Deposition of Paula Christopher at 24:14-15.

B. Creating PDF Files

There are basically two ways that PDF files can be created. First they can be created using programs that transfer data from one format into another. For example, if you are using Microsoft Word to create documents, and have the professional PDF package from Adobe, then an option will be added to Word to store files in PDF format. This is done by first creating a file in the standard Word format, and then using the Adobe software to convert this file from Word to PDF format.

The other common way of producing PDF files is to start with a printed work, such as a text book or a journal article, and use a scanner. A scanner is a device in which the source document is loaded, much as you would load a photocopying machine, but the output is a PDF file rather than another paper copy. The PDF file captures all aspects of the original document, including page layout, fonts used, diagrams, etc., and is in every respect a copy of the original paper document. Use of a scanner in this way creates a digital copy just as would be the case if a photocopier were used to make a paper copy.

However created, the resulting PDF file, once digitized, can be further transferred and copied to create additional exact copies. Whereas making multiple additional paper copies of large amounts of material can be both very time consuming and expensive, making multiple digital copies of a PDF file is very quick and inexpensive (and in practice usually free). For instance, someone in possession of a PDF file on their computer can send out email to their friends attaching a copy of the PDF file, thus making a large number of copies at the touch of a button.

C. Transferring PDF Files Over the Internet

PDF files can be digitally transferred through any of the normal mechanisms used to transfer computer files, including copying from one hard disk to another, burning to a CD or DVD, or transmitting them over the internet from one internet node to another. Each time such a transfer takes place an additional copy is made. Most relevant here, when a PDF file is viewed over the internet, a transfer takes place and a copy of the PDF file is made on the recipient's computer. Since the original file is intact, this action causes a new copy of the file to be made (or, in reality, multiple copies, as described below).

There are at least two ways that PDF files can be distributed over the internet. First, they can be sent as attachments to email messages. In this usage, the recipient of the email message can click on the attachment, and then has a choice of either opening and viewing the file directly on the screen, or storing the PDF file in a designated location (for example, a local documents folder) as a permanent disk file for later viewing, printing, or copying elsewhere.

The second form in which PDF files are transmitted over the internet is in the context of the World Wide Web, where information is viewed using a browser such as Internet Explorer, Firefox, or Safari. Usually, a web page will contain a clickable link that provides the address of a PDF file stored on a computer disk. Clicking on this link gives the user similar options to clicking on a PDF email attachment as described above. The visitor to the web site typically has the option of either viewing the file immediately or storing a permanent copy on a local hard disk for later viewing.

When a PDF file is transferred across the internet – such as when a GSU student clicks on a link for a course reading on an ERes or uLearn page – multiple copies are made. At the "sending" side (*e.g.*, the GSU ERes or uLearn server where PDF copies of course reading materials are stored), the file must first be read from the server disk and a temporary copy made in the memory of the transmitting computer; it is this latter copy that is then transmitted over the internet using a standard internet transfer protocol. Along the way, sections of the file will be stored in the buffer cache memory of intermediate internet nodes, creating additional copies. These copies may be cached for some considerable period of time – and are created even when the transmission occurs from one location on the GSU network (the ERes server) to another (the student's computer).

At the receiving end, a copy is made in the "random access memory," or "RAM," of the receiving computer, and another copy is written to the hard disk. This copy is made automatically, and occurs whether or not the student also chooses to save a copy to a local documents folder. When the recipient opens and views the file, yet another copy of the file is created on the computer disk, as the PDF viewing software (such as the Adobe Acrobat reader) needs to store the file locally before it can convert it into viewable form. The viewing software then creates a converted copy of the information, in the memory the computer's graphics controller, in a format that can be understood and displayed by the graphics card of the machine.

The latter copy is necessary because the graphics controller cannot display the file directly from the locally stored copy.

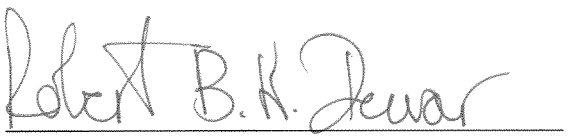
PDF files can be printed, recreating the original paper form from which they were created. The student at the receiving end may also create additional copies, either by saving a copy to their "my documents" folder (or other local folder); by transferring a copy to auxiliary equipment (*e.g.*, an iPhone); by making backup copies on DVDs, CDs, or flash memory; or by emailing a copy to other individuals.

V. Conclusions

As I noted in the Introduction, Dr. Crews takes the position that the provision of course materials through ERes is essentially the equivalent of putting those materials on hard-copy reserve in the library. In a traditional paper reserve system, a professor teaching a class can ask the library to put certain books or journal articles on reserve. Students can then go to the library and either sit in the library reading the material, or check it out for limited periods of time, but the library does not make and distribute copies to each of the students.

However, unlike traditional hard-copy reserves, where a single copy of a work is placed in a reserve area in the library, provision of course materials through ERes or uLearn entails – as I have demonstrated above – the distribution of copies of the reading material to each and every student in the class who accesses the material online.

This activity is, in my opinion, more akin to the use of hard-copy coursepacks than traditional hard-copy reserves – each of which I've had plenty of experience with as a professor for 35 years. With both coursepacks and electronic reserves, professors assemble the material in much the same way, choosing chapters from books, journal articles, etc. With coursepacks, the professor takes these materials to a commercial copy shop (or, at some universities, a department of the university that performs this function), which makes a master copy of this material and then distributes multiple copies for students. With electronic reserves, the professor takes the materials to the library, which stores a master copy on the ERes server and then distributes multiple copies to the students who access the material on the ERes web site. From a technical point of view, the only salient difference between the two is that the ERes copies are distributed to students electronically, in the form of PDF files, rather than as photocopied paper copies.



Robert B.K. Dewar

October 14, 2009

Appendix A
Curriculum Vita
Robert B. K. Dewar

Born: June 21, 1945

EDUCATION

Copthorne Prep school 1952-1958
Copthorne, Sussex, England

Won open scholarship to St. Pauls, 1958

St. Paul's Public School 1958-1959
London, England

Emigrated with family to USA in 1959, with permanent residence status

University of Chicago Lab School 1959-1961
Chicago, IL

Admitted to University of Chicago as a University Scholar

University of Chicago, the college 1961-1964

Graduated with BS in chemistry in 1964, having already completed all course work for the graduate program, and having passed the test for admission to PhD research.

University of Chicago, graduate school 1964-1968

Graduated with PhD in chemistry in 1968
Awarded the Elizabeth Norton prize for excellence in submitted thesis

EMPLOYMENT

Assistant Professor of Information Science
Illinois Institute of Technology, Chicago IL 1968-1970

Received tenure from IIT, 1970

Associate Professor of Computer Science
Illinois Institute of Technology, Chicago IL 1970-1975

Visiting Fellow 1971-1974
Electronic Computer Laboratory (summers)
University of Leeds

Research Associate Professor of Computer Science Courant Institute of Mathematical Sciences New York University, New York (www.cs.nyu.edu)	1975-1976
Director of Graduate Studies, Computer Science CIMS, NYU	1975-1976
Received tenure from NYU, 1976	
Full Professor of Computer Science CIMS, NYU	1976-2005
Chairman of department of Computer Science CIMS, NYU	1977-1980
Director of Undergraduate Studies, Computer Science CIMS, NYU	1981-1987
Associate Director of Courant Institute	1994-1997
Founded Ada Core Technologies in 1994	
President and CEO Ada Core Technologies (www.gnat.com)	1994-present

TEACHING EXPERIENCE

(representative list of course topics taught at Illinois Institute of Technology and New York University)

Undergraduate

Introduction to programming for non-majors
First course for majors (CS1/CS2 equivalents, taught in Fortran, Pascal, SNOBOL, Ada 95)
Assembly language and Computer Architecture
Operating Systems
Microprocessors
Text processing systems
Programming Languages
Formal language theory
Numerical Analysis
Data processing
Introduction to Algol-68

Graduate

Formal language theory
Theory of Computation

Algorithms
Programming Languages
Compilers
Data Communications
Microprocessor Architectures
Real Time Systems
Information Theory
Programming by Transformation

In preparation

Technical Aspects of Software Copyright Issues (with NYU Law School)

PUBLICATIONS

1. Fleischer, E.B., Stone, A.L., Dewar, R.B.K., Wright, J.D., Keller, C.E., and Petit, R., *The Molecular Structure of the Complex of Cyclooctatetraene and Iron Pentacarbonyl*, JASC 88, 3158, 1965.
2. Fleischer, E.B., Kaiser, E.T., Langford, P., Hawkinson, S., Stone, A.L., Dewar, R.B.K., *The Molecular Structure of Five- and Six-Membered Cyclic Sulphonates*, Chem. Comm., 197, 1967.
3. Dewar, R.B.K. and Manacher, G.K., *Some New File-Handling Input-Output and Monitoring Procedures for Use with the SNOBOL Language*, ICR QUARTERLY REPORT 12, University of Chicago, 1967.
4. Dewar, R.B.K., *Use of the Symbolic Addition Method in the Solution of Centrosymmetric Structures: Description of a Computer Program to Automate this Process*, III, 1969, 100pp.
5. Manacher, G.K. and Dewar, R.B.K., *The UNCLL List-Processing Language: A Preliminary Description*, ICR QUARTERLY REPORT 13, University of Chicago, 1967.
6. Manacher, G.K. and Dewar, R.B.K., *The UNCLL Plex-Processing Language: Preliminary Design Description II, and Tentative Programmer's Manual*, ICR QUARTERLY REPORT 15, University of Chicago, 1967.
7. Fleischer, E.B. and Dewar, R.B.K., *The Solution of the Structure of Tribenzotalarene by Automated Symbolic Addition in the Spacegroup in P212121*, ACA Winter Meeting, Tucson, AZ, Abstract J3, February 1968.
8. Fleischer, E.B. and Dewar, R.B.K., *Structure of a Reduce Nickel (II) Tetradentate Macrocycle*, Nature, 222, 1969.
9. Chock, P.S., Dewar, R.B.K., Halpern, J., and Wong, Lai-Yoong, *The Reaction of Pentacyanocobaltate (II) with Hydrogen Peroxide, Hydroxylamine, Cyanogen Iodine*, JASC 91, 1969.
10. Dewar, R.B.K. and Rosen, P., *CALCTRAN (Description and Manual)*, ITT, 1968, 80pp.
11. Dewar, R.B.K., Hochsprung, R. and Worley, W., *The ILTRAN Programming Language*, CACM, October 1969.
12. Fleischer, E.B. and Dewar, R.B.K., *The Structure of Tribenzotalarene,* Acta Cryst., 1971.
13. Dewar, R.B.K., *A Series of Programs for Direct Methods*, paper given at 1969 meeting of international summer school in computing methods in crystallography; Toronto, Canada, published in proceedings, Munkagaard, pp. 63-64, 1970.
14. Dewar, R.B.K. and Belcher, K., *SPITBOL (Description and Programmer's Guide)*, published by Bell Telephone Laboratories, memorandum S4D23, 1971, 90pp.

15. Dewar, R.B.K. and Gray, K.B., *Axiomatic Characterization of the Time-Weighted Rate of Return*, Management Science, Vol. 18, No. 2, October 1971.
16. Dewar, R.B.K. and Lykos, P.G., *The ITT Computation Laboratory*, EDUCOM, Vol. 6, No. 3, Fall 1971.
17. Dewar, R.B.K. and Coulter, C., *Application of Tangent Formula in Protein Crystallography*, Acta Cryst., September, 1971.
18. Dewar, R.B.K., *A Stable Minimum Storage Sorting Algorithm*, Information Processing Letters, Vol. 2, No. 6, April 1974.
19. Dewar, R.B.K. and Belcher, K., *SPITBOL Newsletter's #1, #2, #3, #4, #5*, IIT, published in Dec. 1971, April 1972, June 1972, March 1973, and March 1974, respectively.
20. Dewar, R.B.K. and Buroff, S., *The ITT ALGOL-68 Compiler: Superlanguage Features*, paper given at 1974 International Conference on ALGOL-68 Implementation, University of Manitoba, Winnepeg, Canada, published in proceedings.
21. Dewar, R.B.K. and Buroff, S., *Techniques for Independent Compilation of ALGOL-68 Program Segments*, paper given at 1974 International Conference on ALGOL-68 Implementation, University of Manitoba, Winnepeg, Canada, published in proceedings.
22. Dewar, R.B.K., *Indirect Threaded Code*, CACM, June 1975.
23. McCann, A.P. and Dewar, R.B.K., *1900 SPITBOL Technical Report No. 55*, University of Leeds, December 1974.
24. Dewar, R.B.K., Belcher, K. and Cole, J., *UNIVAC/SPITBOL*, Version 1.0, ITT, March 1975.
25. Dewar, R.B.K., Grand, A., Schonberg, E., and Schwartz, J., *The SETL Data Structures*, SETL Newsletter No. 189, November 1976. Courant Institute, New York University.
26. Dewar, R.B.K. and McCann, A.P., *MACRO SPITBOL – A SNOBOL4 Compiler*, Software Practice and Experience, Vol. 7, 1977.
27. Dewar, R.B.K., Belcher, K. and McCann, A.P., *SPITBOL Implementation*, proceedings of 5th III Conference Guide1, France IRIA, 1977.
28. Dewar, R.B.K., Schwartz, J.T., et al., *SETL as a Tool for Generation of Quality Software*, proceedings of Conference on Software Quality; Novosibirsk, North Holland, 1977.
29. Dewar, R.B.K. and Schwartz, J.T., et al., Programming by Refinement as Exemplified by the SETL Representation Sublanguage, *TOPLAS*, 1, 1, pp 27-49, July 1979.
30. Dewar, R.B.K. and Schonberg, E., *The Elements of SETL Style*, proceedings of ACM 1979 National Conference, Detroit.
31. Dewar, R.B.K., Fisher, G. and Schonberg, E., et al., *The NYU-Ada Translator and Interpreter*, invited paper at IEEE COMPSAC Conference, Chicago, 1980.
32. Dewar, R.B.K., Fisher, G. and Schonberg, E., et al., *Experiences with the NYU-Ada Translator and Interpreter*, SIGPLAN Symposium on the programming language Ada, December 1980.
33. Dewar, R.B.K., Grand, A., Schonberg, E., and Schwartz, J., *Higher Level Programming*, MSS 550pp., Introduction to the Use of the Set Theoretic Language SETL, Courant Institute of Mathematical Sciences, NYU, July 1981.
34. Dewar, R.B.K, Sharir, M., and Weixelbaum, E., *Transformational Derivation of a Garbage Collector*, TOPLAS, October 1982.
35. Dewar, R.B.K, Sharir, M., and Merritt, S., *Some Modified Upsequence Algorithms*, Acta Informatica, May 1983.
36. Dewar, R.B.K., Kruchten, P. and Schonberg, E., *Prerequisites for a Formal Definition of Ada*. Position paper to the Ada-Europe working group on formal definitions, Brussels, December 9, 1983.
37. Dewar, R.B.K., Flynn, S. and Schonberg, E., *Memory Allocation Strategies for Ada on Hierarchical Memory Multiprocessors*. Proceedings of the 1989 Ada-Europe Conference, June 1989.

38. Dewar, Robert with Frank Betz, Fisher, D., Gutlag, J., Hudak, P., Wand, M., Balzer, R. (chairman), Gabriel, R. (editor), Draft report on *Requirements for a Common Prototyping System*, November 1988.
39. Dewar, R.B.K., *Shared Variables and Ada 9x Issues*, Ada 9X Special Report, Software Engineering Institute, January 1990.
40. Dewar, R.B.K., *The Fixed Point Faculty in Ada*, Ada 9X Special Report, Software Engineering Institute, February 1990.
41. Dewar, R.B.K., *Uniformity Issues in Ada 9X*, Technical report from ISO TC2/WG9/URG, preliminary version published in November 1990.
42. Dewar, R.B.K., *Proposal for IEEE bindings for Ada 9X*. Preliminary version submitted to ISO TC2/WG9/NRG (Numerics Rapporteur Group) February 1990.
43. Goodenough, John (ed), Dewar, R.B.K., Evan, Art, Brosgol, Benjamin. *Ada 9X Requirements*, Ada 9X Project office, December 1990.

BOOKS

Computers in the X-Ray Phase Problem
PhD Thesis, 1968
Robert B. K. Dewar
University of Chicago, 1968

IITRAN Programmer's Manual and Language Description
Robert B. K. Dewar
Four Pi, Inc., 1971.

CALCTRAN Description and Programmer's Guide
Robert B. K. Dewar
Four Pi, Inc., 1971

COMVEST Users Guide
Analysis of Pension Fund Investment Performance
Robert B. K. Dewar, Kenneth Gray, and Larry Fisher
Banking Administration Institute, 1969

Programming with Sets: An introduction to SETL
Robert B. K. Dewar, Jack Schwartz, J. Dubinsky, Edmond Schonberg
Springer-Verlag, 1986

Macro-SPITBOL, the High Performance SNOBOL4 Language
Robert B. K. Dewar, Mark Emmer, Edward Quillen
Catspaw, Inc. 1989

Microprocessors: A Programmer's View
Robert B. K. Dewar, Matthew Smosna
McGraw Hill, 1990

Impact of Innovative Architectures
Robert B. K. Dewar
Chapter in Aerospace Software Engineering
Edited by Christine Anderson

American Institute of Aeronautics and Astronautics Inc. 1991

GNAT Users Guide
Robert B. K. Dewar, et al
First version published by Silicon Graphics, 1995
Subsequent editions published by Ada Core Technologies, 1996-2000

GNAT Programmers Reference Manual
Robert B. K. Dewar, et al.
First version published by Silicon Graphics, 1995
Subsequent editions published by Ada Core Technologies, 1996-2000

OTHER PUBLICATIONS

Series of ten articles on various micro-processor architecture issues and UNIX software maintenance issues, Unix Today, 1991-1992 (published with Matthew Smosna, as regular featured columnists on these issues).

Numerous articles on the use and importance of Ada in various trade magazines.

PROFESSIONAL ACTIVITIES

(some of the dates are approximate)

ACS (American Chemical Society) National Lecturer, 1969 (lectured on computational issues in modern chemical research).

Member of the Association for Computing Machinery

Permanent member of IFIP WG2.1 (working group on Algorithmic languages)

Chairman of IFIP WG2.1, (1985-1991)

Distinguished Reviewer for Ada 83 development (1980-1983)

Member of the Ada Board (Federal Advisory Panel, advised Ada Joint Program Office on Ada Policy, 1986-1991)

Distinguished Reviewer for Ada 9X development (1989-1995)

Member of ISO (International Standards Organization) WG9 ARG (Ada Rapporteur Group – the Ada language maintenance committee). 1985-present

Chairman of ISO WG9 URG (Ada Uniformity Rapporteur Group), 1990-1993

Chairman of ISO WG9 CRG (Ada Character Issues Rapporteur Group), 1994-1995

Member of ISO WG8 NRG (Ada Numerics Rapporteur Group), 1991-1994

Member of the U.S. Delegation to ISO WG9 (Working Group on Ada), and member of the U.S. TAG (technical advisory group).

ACM/SIGAda National Lecturer, giving talks at SIGAda chapters on Ada (1989-1992)

Track Chairman (education track) for Tri-Ada conference, 1991

Member of Program Committee for IFIP TC2/WG2.1 Working Conference on Constructing Programs from their Specifications (1988)

Member of the DARPA Prototech Executive Committee, advising DARPA on issues in design of prototyping languages, 1990

Project Director for Ada 9X implementation Analysis Team (IAT), 1998-1991

Member of Ada 9X ACVC Review Committee (1993-1995)

Member of the Ada 9X Executive Committee (1992-1995)

Member of the AVO Fast Reaction Team (advises Ada Validation Organization on Ada validation policy issues), 1983-1998

Member of the ACATS Fast Reaction Team (successor to AVO Fast Reaction Team), 1998-present.

Member of the Ada Resource Association (representing Ada Core Technologies), 1998-present.

SOFTWARE EXPERIENCE

(includes only software marketed commercially where Robert Dewar was a primary or the only author)

1. Scientific Applications

a. MAGIC. Program for automated solutions of centrosymmetric X-ray crystal structures. R.B.K. Dewar and A.Stone (1967). FORTRAN 14,000 lines.
b. PLR. Data reduction program for the PAILRED X-ray data collection machine. R.B.K. Dewar (1967) IBM-7094 Assembly, 7000 lines.
c. PPNC. Fourier transform and contour package. R.B.K. Dewar (1967) FORTRAN, 4000 lines.
d. SORFLS. Crystollographic Least Squares. R.B.K. Dewar and M. Bennett (1968) FORTRAN, 4000 lines.
e. SORFFE. Crystollographic error analysis. R.B.K. Dewar (1967) FORTRAN, 4000 lines.

Note: These crystallographic programs were widely distributed to industry and universities throughout the world, and some of them are still in use in modified forms today.

2. Commercial Applications

a. COMVEST. Analysis of Pension Fund Investment Performance. R.B.K. Dewar and L. Fisher (1969), FORTRAN, 8000 lines. Marketed to U.S. banks and trust funds by the Banking Administration Institute, Chicago, IL.
b. LVDF. Distributed screen-forms oriented data collection system for the INCOTERM SPD 10/20. R.B.K. Dewar (1974), SPD assembly language, 15,000 lines, written for Vickers Ltd. and Incoterm Ltd., UK.

c. DBMS/DBINQ. Data base management and inquiry program for the Honeywell SPD 20/40 series machines, marketed as part of the RDE (remote data entry) system by Honeywell UK, R.B.K. Dewar (1975), SPD assembly language, 12,000 lines.
d. SGDEM. Demonstration data entry program for banking industry. Written for Transac, Paris, France as part of the requirements for the Societe Generals banking system. R.B.K. Dewar (1975), SPD assembly language, 6,000 lines.

3. Compilers

3a. UNCLL (University of Chicago Low Level List Processing Language). Preliminary compiler for IBM 7094. R.B.K. Dewar (1967), FAP Macro, 5000 lines.

3b. CALCTRAN (Conversational Desk Calculator Programming Language). Interpretor for IBM 350, R.B.K. Dewar and B. Rosen, IBM Assembly, 4000 lines. Marketed by Four-Pi Systems, Chicago, IL.

3c. IITRAN/360. Student language used at Illinois Institute of Technology for teaching beginning programming, and used by over 50 schools and colleges in the Chicago are as part of an NSF sponsored project. R.B.K. Dewar, R, Hochsprung and W. Worley, (1965-1969). IBM 360 assembly language, 20,000 lines.

3d. SPITBOL. Fast SNOBOL 4 compiler for IBM 360. In use at over three hundred universities and industrial sites. R.B.K. Dewar and K. Belcher (1969-1973) IBM 360 assembly language, 30,000 lines.

3e. IITRAN/1108. Version of IITRAN for UNIVAC 1108. R.B.K. Dewar and R. Schlesinger (1970-1971), 1108 assembly language, 15,000 lines.

3f. IITRAN/9400. Version of IITRAN for UNIVAC 9400, written under contract to UNIVAC for use in the Montreal School System, R.B.K. Dewar and R. Schlesinger (1970), 9400 assembly language, 22,000 lines.

3g. SPITBOL/1108. Version of SPITBOL for the UNIVAC 1108. R.B.K. Dewar and K. Belcher, 1108 assembly language, 20,000 lines.

3h. MACRO SPITBOL. Version of SPITBOL written in a specially designed machine independent macro system. R.B.K. Dewar and A.P. McCann (1974-1977), MINIMAL, 24,000 lines. This system has since been translated for over 20 different processors and is in use at over 1000 sites.

3i. SETL. Translator and Interpretor for the Set Theoretic Language invented at NYU by J. Schwartz, R.B.K. Dewar, A. Grand and S. Freudenberger (1976-1982), LITTLE, 100,000 lines.

3j. NYU Ada/Ed. This was the first validated Ada translator. Written under contract to the U.S. Army at Fort Monmouth, distributed by the National Technical Information Software Exchange, in use at over 300 sites. R.B.K. Dewar, G. Fisher, E. Schonberg, et al., SETL 20,000 lines.

3k. Realia COBOL ANSI 74 COBOL compiler for the Intel 8086, written with K. Belcher and M. Sokol of Realia, Inc. under contract to Transac, Paris, France. Released for IBM PC 3rd quarter of 1983. Passes 3 and 4 (COBOL, 40,000 and 20,000) and the run time library (8086 Assembly language, 80,000 lines) were written by R.B.K. Dewar.

3l. Realia COBOL debugger. One of the first visual debugger technologies. Written for Realia Inc, and used by all their COBOL customers, 8086 assembler, 15,000 lines. 1984.

3m. Alsys Ada compilers for 80x86 and Power PC. Consulted on all phases of design and wrote the back end FINAL phase (backend optimizer, Ada 30,000 lines), and much of the runtime library (8086 assembler, 10,000 lines), 1985-1991.

3n. Ada Verify. Extremely fast Ada syntax checker, distributed with Alsys Ada compilers (Ada 20,000 lines), 1988.

3o. Floating Point Simulator for Alsys Ada compiler. Complete floating point simulator packages for 8087 and 80287 architectures. Used in Alsys compilers on machines with no hardware floating point. 1991, Assembler 4000 lines.

3p. The GNAT compiler, a complete compiler technology for Ada2005 (still the only Ada 2005 compiler). In use at major corporations throughout the world, including Lockheed, Boeing, Raytheon, CSC etc. Robert Dewar was one of the primary authors. The entire system is approximately 600,000 lines of Ada, with Robert Dewar being the primary contributor for at least one third of the total system, and reviewer and project manager for the entire system.

3q. SPITBOL interface for GNAT, a complete interface to SPITBOL pattern matching for use with Ada 95, distributed as part of the GNAT runtime (Ada 95, 4000 lines).

4. Operating Systems and Executives

4a. IMS. Student Monitor System for UNIVAC 1108, R.B.K. Dewar and R. Schlesinger (1970), 1108 Assembly, 2000 lines.

4b. COS 10/20. Assembler and cassette operating system for the INCOTERM SPD 10/20. Written under contract to Incoterm Corp. R.B.K. Dewar (1971-1972) SPD assembly, 12,000 lines.

4c. SPD/DOS. Disk Operating System for Incoterm SPD 10/20 and 20/20. Written under contract to Incoterm Corp., in use at over 1000 sites. R.B.K. Dewar (1971-1972), SPD assembly, 40,000 lines.

4d. PD/FMS. Disk Operating System and File Management System for Incoterm SPD 20/40, written under contract to Incoterm Corp., in use at over 200 sites. R.B.K. Dewar (1975-1977), SPD assembly, 80,000 lines.

4e. EXEC/15, DOS/15. Executive and Disk Operating System for Honeywell SPD 15/25 system, written under contract to Honeywell Corporation, R.B.K. Dewar (1977-1979) 8086 assembly, 75,000 lines.

4f. EXEC/88. Real time executive for the Intel 8086 for use on Honeywell ATM machines and SPD XX. R.B.K. Dewar, 8086 assembly language, 5000 lines.

4g. RTX80. Real time executive for Intel 8088, written under contract to F & S Systems Corp. R.B.K. Dewar, 8088 assembly language, 3000 lines.

4h. WFMS,. Modified version of PD/FMS, written for Honeywell Corp., for use on the Winchester based SPD 20/40. R.B.K. Dewar (1980-1983), SPD assembly, 50,000 lines.

5. Other System Software

5a. SPD RBT/900. A series of five remote batch terminal emulators for the Incoterm SPD 10/20, written under contract to Incoterm Corp. R.B.K. Dewar (1972-1973), SPD assembly, 14,000 lines.

5b. Assembler and linker for the Intel 8088 program development system, written under contract to Transac, Paris, France. R.B.K. Dewar (1978), SPD assembly, 26,000 lines.

5c. Assembler and linker for Intel 8088 development systems for use with Honeywell Level-6 development system, written under contract to Honeywell Corp, R.B.K. Dewar (1978), PASCAL, 14,000 lines.

5d. VAX based development system for 8086 (assembler and linker), written under contract to Scott Systems, Boston, MA. R.B.K. Dewar (1982), C, 14,000 lines.

5e. SPACEMAKER and TERMULATOR, commodity software for IBM PC (PC DOS file compression utility and VT-100 emulator), being marketed by Realia, Inc. R.B.K. Dewar (1982-1983), 8088 assembly language, 8,000 lines.

5f. Screen editor for VERSAL S20 machine, written under contract to VERSAL AB (Stockholm, Sweden), R.B.K. Dewar (1982-1983), UCSD PASCAL, 4,000 lines.

5g. DVED, visual screen editor for the IBM PC, Freeware program, R.B.K. Dewar (1983), 8088 assembly language, 10,000 lines.

5h. DUTIL, Dewar Utilities. Collection of utilities distributed as shareware for IBM PC. – includes advanced version of DVED, see 5g, (1986-1990), 8086 assembler, 20,000 lines, C, 5000 lines.

5i.DAS, DED, DDB. Assembler, Editor and Debugger for teaching elementary assembly language programming (1986, COBOL, 5000 lines, 8086 assembler, 15,000 lines).

5j. Assembler and linker for x86 based system F&S Systems Corp, (C 20,000 lines), 1982

OTHER CONSULTING EXPERIENCE

Technical Consulting

1. Served as member of site visit team for computer assisted instruction initiative, NSF 1975

2. Consulted for Mitre Corp, Washington, D.C on the design of the operating system to support the TICCET Computer Assisted Instruction system, developed with NSF support, 1975.

3. Consulted for Incoterm Corporation on design and development of their intelligent terminal systems, 1972-1977.

4. Consulted for Honeywell Corporation on design and development of intelligent terminal systems, 1977-1981

5. Consulted for MacDonald Automation, Hospital Services Division, St. Louis, MO on design of COBOL application programs for file handling, including interactive data entry and batch processing functions, 1980-1981.

6. Consulted for Realia Inc on general COBOL design issues, also worked with many Realia customers, helping them to use Realia COBOL to design and implement their applications, 1982-1985

7. Consulted for F&S systems, on design of operating system and utilities for their x86 based products, 1982.

8. Consulted for Intermetrics Corp, on the design of the Red Language (one of the competing designs for the Ada project), 1981.

9. Consulted for Transac SA, Paris, France, on the design of their new operating system for the SPD 27 system (the first commercial system in the world based on the 8086 architecture from Intel), with particular emphasis on file handling and transaction handling (1980-1982).

10. Consulted for VERSAL AB. Stockholm, Sweden, on the design of S10, S20, and S30 machines. This involved the design of a new microprocessor architecture specialized for execution of UCSD Pascal (1982-1983).

11. Consulted for Alsys Inc, on the design of Ada compiler technology, 1986-1993.

Professional Recognition

1. Acknowledgment from President of ACM (President's Letter, Communications of the ACM, December 1987). "examples abound of significant programs, programs of enormous practical importance, that were written by individuals: Thompson and Ritchie's original UNIX, Bricklin and Fylstra's Visicalc, Knuth's TEX, Dewar's Realia COBOL, and Reid's Scribe"

2. Outstanding Ada Community Contributions, Awarded by ACM SIGAda to Robert Dewar, 1995.

3. Certificate of Appreciation for contributions to Ada 83 development, signed by the Undersecretary of Defense (approximately 1993)

4. Commemorative Award for contributions to the completion of the Ada 95 standard, from the Ada Joint Program Office of the department of defense, 1996.

Legal Consulting

(includes cases where Robert B. K. Dewar was retained as expert witness and testified)

1. National Data Communications vs. St. Mary's Hospital. Case involving software copyright issues, trial in US Federal Court, Texas 1982.

2. 580 F.Supp.474. Selden vs. Honeywell, 1984. Case involving allegations of fraud in connection with delivery of operating system software. Trial in New York Federal Court.

3. 1998 WL 800344, Intergraph vs. Bentley, 1998. Case involving software copyright and licensing issues. Trial in Philadelphia Federal Court.

4. GEAC vs. GRACE, 1997-2000. Case involving software copyright issues. Trial in Newark Federal Court.

5. Akamai vs Cable and Wireless, 2003-2004, Case involving patents for internet content distribution methods. Trial in Boston Federal Court

Robert Dewar's Contributed Articles

March 2005 – June 2009

Note: Items in Red are European Publications

Publication	Topic/Title	Author	Status	Web Link
Military Embedded Systems	"FLOSS helps you take control of your bytes"	Robert Dewar	Published in September 2005 e-Letter. Also published in VMEbus Systems October 2005 Issue and MES Spring 2006 Issue.	http://www.mil-embedded.com/articles/id/?820 http://www.vmecritical.com/articles/id/?820
COTS Journal	"Ada 2005 Strengthens Ada's Safety-Critical Muscles"	Robert Dewar	Published in November 2005 Issue	http://www.cotsjournalonline.com/home/article.php?id=100424
VMEBus Systems	"Using static analysis tools for safety certification"	Robert Dewar Ben Brosgol	Article published in April 2006 issue.	http://www.vmecritical.com/articles/id/?2
Embedded Systems Europe	"Safety-Critical Design for Secure Systems"	Robert Dewar	European publication. Article published in June 2006 issue.	http://i.cmpnet.com/embedded/europe/esejun06/esejun06p35.pdf
ECN Magazine	"Ada for Embedded Programming"	Robert Dewar Jose Ruiz	"Web-exclusive" article published online in September 2006 and was also cross-promoted in September print issue.	http://www.ecnmag.com/article.aspx?id=122782&terms=AdaCore
Cross Talk	"Integrated Quality Assurance for Evolutionary Multi-	Robert Dewar	Ben revised September 2002 article for online publication. "Web-exclusive"	http://www.stsc.hill.af.mil/crosstalk/2006/11/0611dewar.html

Publication	Topic/Title	Author	Status	Web Link
	Platform Software Development"		article was published on October 30, 2006.	
Military Embedded Systems	"Building secure software: your language matters!"	Robert Dewar Rod Chapman	Published online and in the Winter 2006 issue.	http://www.mil-embedded.com/PDFs/AdaCore.Win06.pdf
EE Times	"Ada Enhances Embedded-Systems Development"	Robert Dewar Ben Brosgol Jose Ruiz	Published in the January 1, 2007 Design Feature on Embedded Systems Design Languages, (print and online. Article also picked up on DDJ Portal, Embedded.com, Programmable Logic DesignLine, RTCmagazine, Industrial Control DesignLine, and ACM TechNews.	http://www.eetimes.com/showArticle.jhtml;jsessionid=5VPP25S4VFDM2QSNDLPSKHSCJUNN2JVN?articleID=196701748 • www.ddj.com • www.embedded.com • www.pldesignline.com • www.rtcmagazine.com • www.industrialcontroldesignline.com • www.technews.acm.org
SD Times	Guest View - "Why high-security systems require open-source software"	Robert Dewar	Published online on January 15, 2007	http://www.sdtimes.com/article/column-20070115-01.html
EE Times	Letter to the Editor - "Ada vs. Java vs. C/C++ "	Robert Dewar	Published online and in July 2, 2007 issue.	http://www.eetimes.com/showArticle.jhtml;jsessionid=5VPP25S4VFDM2QSNDLPSKHSCJUNN2JVN?articleID=200001095
Electronic Design	Point of View – "Multithreading: It's not new!"	Robert Dewar	Published online and in the April 18, 2007 ED Update e-mail newsletter	http://www.elecdesign.com/Articles/Index.cfm?ArticleID=15410
Doctor Dobb's Journal	"Alia Vox" Guest Editorial - "Safety AND Security"	Robert Dewar	Published online May 7 and in the June 2007 print issue. Also published online on Embedded.com May 7, 2007	http://www.ddj.com/dept/security/199300140 http://www.embedded.com/showArticle.jhtml?articleID=199502018
COTS Journal	"Ada "Reloaded" a Winner for High-Integrity Real-Time Apps"	Ben Brosgol Robert Dewar	Published online and in July 2007 issue.	http://www.cotsjournalonline.com/home/article.php?id=100687
SD Times	"Letters to the Editor - Ada's Tried and Tested"	Robert Dewar	Robert's reponse to Jennifer deJong's Safety-critical Java Article was published 10/1/2007	http://www.sdtimes.com/article/opinion-20071001-03.html
CrossTalk	"Computer Science Education: Where Are the Software Engineers of Tomorrow?"	Robert Dewar Ed Schonberg	Published January 2008 Issue. Article generated significant buzz in online news sites and blogs worldwide	http://www.stsc.hill.af.mil/CrossTalk/2008/01/0801DewarSchonberg.pdf'
Electronic Design	Point of View: "Use Ada for Better Safety, Security, and And Reliability"	Robert Dewar Ben Brosgol	Managing Editor Rich Gawel posted the opinion piece online on February 2, 2008. It also ran as part of the ED Update e-mail newsletter and in the Feb. 28 Web Table of Contents in print.	http://electronicdesign.com/Articles/ArticleID/18141/18141.html

Publication	Topic/Title	Author	Status	Web Link
EE Times	Design Feature: "There's nothing new about multi-core mania"	Robert Dewar	Article published online on February 26, 2008	http://www.eetimes.com/news/design/showArticle.jhtml?articleID=206900265
Military Embedded Systems	Legacy Software Migration Column: "Ada Matters!"	Robert Dewar	Article published online on and in May print issue. Debut of MES' new Legacy Software Migration column.	http://www.mil-embedded.com/pdfs/LegacySWMigration.May08.pdf
Embedded Systems Engineering	"Security in High Reliability Applications: Is it safe?"	Robert Dewar	Paris office re-purposed Robert's SD Times Guest View [F928-013]. Article was published in the April 2008 print issue and online on May 1, 2008.	http://www.esemagazine.com/index.php?option=com_content&task=view&id=509&Itemid=2
Embedded Control Europe	"Embedded Insecurity: just how much is at risk?"	Robert Dewar	Article appeared online and in the June2008 print issue, (page 15).	http://www.embedded-control-europe.com/c_ece_knowhow/237/ecejun08.pdf
Software Tech News	"Software and Intellectual Property Rights"	Robert Dewar	Article appeared online and in print as part of August 2008 newsletter.	https://www.softwaretechnews.com/stn_view.php?stn_id=45&article_id=110
Embedded.com	"Open Source Software for High Reliability Applications: Is it safe?"	Robert Dewar	Article appeared online on October 29, 2008	http://www.embedded.com/design/opensource/211600582?_requestid=307145
ECN	"Take a New Look at Ada"	Robert Dewar	Article was published on Ecnmag.com on November 17, 2008.	http://www.ecnmag.com/Embedded-Systems-Take-a-New-Look-at-Ada.aspx?menuid=548
Military Embedded Systems	"Legacy is not a Four Letter Word"	Robert Dewar	Article was published digitally on MES.com on January 1, 2009	http://www.mil-embedded.com/articles/id/?3729
Military Embedded Systems	"Legacy Software, It's the "new" thing."	Robert Dewar	Article, was published in the March/April 2009 print issue.	Print only
Embedded Computing Design	"Making Static Analysis a Part of Code Review"	Robert Dewar Tucker Taft	Article appeared online and in the June 2009 e-Newsletter.	http://www.embedded-computing.com/articles/id/?4014
Communications of the ACM	Point-Counterpoint Feature on Computer Science Education	Robert Dewar	Robert's "point" for the point-counterpoint feature was published in the July 2009 print issue	In print Not online yet

Appendix B

Report of Robert B. K. Dewar

List of Materials Reviewed

- Amended Complaint, *Cambridge University Press, et al. v. Patton, et al.*, Civil Action No. 1:08-CV-1425-ODE;
- Expert Report of Kenneth D. Crews (June 1, 2009)
- Deposition of James Palmour (April 23, 2009)
- Deposition of Paula Christopher (June 10, 2009)
- Deposition of Laura Burtle (April 24, 2009)
- Deposition of Jason Reifler (June 3, 2009)
- Stipulations of Fact regarding ERes and uLearn usage at Georgia State University (July 10, 2009) (draft and final)
- Docutek ERes website, http://www.docutek.com (last visited Oct. 14, 2009);
- GSU Library Course Reserve Page, http://www.library.gsu.edu/reserves/ (last visited Oct. 14, 2009).