

FIPS PUB 109



FEDERAL INFORMATION  
PROCESSING STANDARDS PUBLICATION

1985 JANUARY 16

U.S. DEPARTMENT OF COMMERCE/National Bureau of Standards



PASCAL

FIPS PUB 109

JK  
468  
A8A3  
#109  
1985

CATEGORY: SOFTWARE STANDARD  
CATEGORY: PROGRAMMING LANGUAGE

**U.S. DEPARTMENT OF COMMERCE, Malcolm Baldrige, *Secretary***  
**NATIONAL BUREAU OF STANDARDS, Ernest Ambler, *Director***

## **Foreword**

The Federal Information Processing Standards Publication Series of the National Bureau of Standards is the official publication relating to standards adopted and promulgated under the provisions of Public Law 89-306 (Brooks Act) and under Part 6 of Title 15, Code of Federal Regulations. These legislative and executive mandates have given the Secretary of Commerce important responsibilities for improving the utilization and management of computers and automatic data processing in the Federal Government. To carry out the Secretary's responsibilities, NBS, through its Institute for Computer Sciences and Technology, provides leadership, technical guidance, and coordination of Government efforts in the development of guidelines and standards in these areas.

Comments concerning Federal Information Processing Standards Publications are welcomed and should be addressed to the Director, Institute for Computer Sciences and Technology, National Bureau of Standards, Gaithersburg, MD 20899.

James H. Burrows, *Director*  
Institute for Computer Sciences and Technology

## **Abstract**

This publication announces the adoption of American National Standard Pascal Computer Programming Language, ANSI/IEEE770X3.97-1983, as a Federal Information Processing Standard (FIPS). The American National Standard Pascal, ANSI/IEEE770X3.97-1983, specifies the form and establishes the interpretation of programs expressed in the Pascal programming language. The purpose of the standard is to promote portability of Pascal programs for use on a variety of data processing systems. The standard is used by implementors as the reference authority in developing compilers, interpreters, or other forms of high level language processors; and by other computer professionals who need to know the precise syntactic and semantic rules of the standard.

Key words: Federal Information Processing Standard; Pascal; programming language standards; software; standards conformance.

Natl. Bur. Stand. (U.S.) Fed. Info. Process. Stand. Publ. (FIPS PUB) 109, 3 pages  
(1985)  
CODEN:FIPPAT



## Federal Information Processing Standards Publication 109

1985 January 16

### Announcing the Standard for PASCAL



Federal Information Processing Standards Publications (FIPS PUBS) are issued by the National Bureau of Standards pursuant to Section 111(f)(2) of the Federal Property and Administrative Services Act of 1949, as amended, Public Law 89-306 (79 Stat. 1127), Executive Order 11717 (38 FR 12315, dated May 11, 1973), and Part 6 of Title 15 Code of Federal Regulations (CFR).

**Name of Standard.** Pascal (FIPS PUB 109).

**Category of Standard.** Software Standard, Programming Language.

**Explanation.** This publication announces the adoption of American National Standard Pascal Computer Programming Language, ANSI/IEEE770X3.97-1983, as a Federal Information Processing Standard (FIPS). The American National Standard Pascal, ANSI/IEEE770X3.97-1983, specifies the form and establishes the interpretation of programs expressed in the Pascal programming language. The purpose of the standard is to promote portability of Pascal programs for use on a variety of data processing systems. The standard is used by implementors as the reference authority in developing compilers, interpreters, or other forms of high level language processors; and by other computer professionals who need to know the precise syntactic and semantic rules of the standard.

**Approving Authority.** Secretary of Commerce.

**Maintenance Agency.** U.S. Department of Commerce, National Bureau of Standards (Institute for Computer Sciences and Technology).

**Cross Index.** American National Standard ANSI/IEEE770X3.97-1983, Pascal.

#### Related Documents.

- a. Federal Information Resources Management Regulation 201-36.1310, Implementation of Federal Information Processing and Federal Telecommunications Standards into Solicitation Documents, Federal Information Processing Standards (FIPS) Programming Languages.
- b. Federal Information Processing Standards Publication 29-1, Interpretation Procedures for Federal Information Processing Standard Programming Languages.
- c. NBS Special Publication 500-117, Selection and Use of General-Purpose Programming Languages.

**Objectives.** Federal standards for high level programming languages permit Federal departments and agencies to exercise more effective control over the production, management, and use of the Government's information resources. The primary objectives of Federal programming language standards are:

- to encourage more effective utilization and management of programmers by insuring that programming skills acquired on one job are transportable to other jobs, thereby reducing the cost of programmer re-training;
- to reduce the cost of program development by achieving the increased programmer productivity that is inherent in the use of high level programming languages;
- to reduce the overall software costs by making it easier and less expensive to maintain programs and to transfer programs among different computer systems, including replacement systems;
- to protect the existing software assets of the Federal Government by insuring to the maximal feasible extent that Federal programming language standards are technically sound and that subsequent revisions are compatible with the installed base.

Government-wide attainment of the above objectives depends upon the widespread availability and use of comprehensive and precise standard language specifications.

**Applicability.**

- a. Federal standards for high level programming languages should be used for computer applications and programs that are either developed or acquired for government use. FIPS Pascal is one of the high level programming language standards provided for use by all Federal departments and agencies. FIPS Pascal is suited for use in programming applications that employ structured programming techniques and that require advanced data typing facilities, especially those applications which are of a size compatible with an implementation in a minicomputer or microcomputer environment.
- b. The use of FIPS high level programming languages is strongly recommended when one or more of the following situations exist:
  - It is anticipated that the life of the program will be longer than the life of the presently utilized equipment.
  - The application or program is under constant review for updating of the specifications, and changes may result frequently.
  - The application is being designed and programmed centrally for a decentralized system that employs computers of different makes, models and configurations.
  - The program will or might be run on equipment other than that for which the program is initially written.
  - The program is to be understood and maintained by programmers other than the original ones.
  - The advantages of improved program design, debugging, documentation and intelligibility can be obtained through the use of this high level language regardless of interchange potential.
  - The program is or is likely to be used by organizations outside the Federal Government (i.e., State and local governments, and others).
- c. Non-standard language features should be used only when the needed operation or function cannot reasonably be implemented with the standard features alone. Although non-standard language features can be very useful, it should be recognized that their use may make the interchange of programs and future conversion to an extended Pascal standard or replacement processor more difficult and costly.
- d. It is recognized that programmatic requirements may be more economically and efficiently satisfied through the use of report generation, database management, or text processing languages. The use of any facility should be considered in the context of system life, system cost, and the potential for data sharing.
- e. Programmatic requirements may be also more economically and efficiently satisfied by the use of automatic program generators. However, if the final output of a program generator is a Pascal source program, then the resulting program should conform to the conditions and specifications of FIPS Pascal.

**Specifications.** FIPS Pascal specifications are the language specifications contained in American National Standard Pascal Computer Programming Language, ANSI/IEEE770X3.97-1983.

The ANSI/IEEE770X3.97-1983 document defines the syntax and semantics of the Pascal language by specifying requirements for a conforming processor and program.

The standard does not specify the size or complexity of programs, the method for reporting errors or warnings, minimum system requirements, the means of supervisory control of programs, or the means of transforming programs for processing.

**Implementation.** The implementation of FIPS Pascal involves three areas of consideration: acquisition of Pascal processors, interpretation of FIPS Pascal, and validation of Pascal processors.

*Acquisition of Pascal Processors.* This standard became effective January 16, 1985. Pascal processors acquired for Federal use after this date should implement FIPS Pascal. Conformance to FIPS Pascal should be considered whether Pascal processors are developed internally, acquired as part of an ADP system procurement, acquired by separate procurement, used under an ADP leasing arrangement, or specified for use in contracts for programming services.

A transition period provides time for industry to produce Pascal processors conforming to the standard. The transition period begins on the effective date and continues for eighteen (18) months thereafter. The provisions of this publication apply to orders placed after the date of this publication; however, a Pascal language processor not conforming to FIPS Pascal may be acquired for interim use during the transition period.

*Interpretation of FIPS Pascal.* NBS provides for the resolution of questions regarding FIPS Pascal specifications and requirements, and issues official interpretations as needed. All questions about the interpretation of FIPS Pascal should be addressed to:

Director  
Institute for Computer Sciences and Technology  
ATTN: Pascal Interpretation  
National Bureau of Standards  
Gaithersburg, MD 20899

*Validation of Pascal Processors.* The General Services Administration (GSA), through its Federal Software Testing Center (FSTC), provides a service for the purpose of validating the conformance to this standard of compilers offered for Federal procurement. The validation system reports the nature of any deviations that are detected. This service is offered on a reimbursable basis. Further information about the validation service can be obtained from the FSTC which is located at 5203 Leesburg Pike, Suite 1100, Falls Church, VA 22041-3467 (703-756-6153).

**Where to Obtain Copies.** Copies of this publication are for sale by National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. (Sale of the included specifications document is by arrangement with The Institute of Electrical and Electronics Engineers, Incorporated.) When ordering, refer to Federal Information Processing Standards Publication 109 (FIPSPUB109), and title. Payment may be made by check, money order, or deposit account.



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## *Periodical*

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