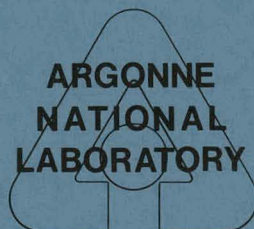


**ARGONNE CODE CENTER
INSTALLATION REPRESENTATIVE GUIDE**



U of C-AUA-USAEC

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ARGONNE CODE CENTER
INSTALLATION REPRESENTATIVE GUIDE

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January 1973

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I. INTRODUCTION

This guide is intended as an introduction and reference manual to the program and operating procedures of the Argonne Code Center. The Center, established in 1960, serves as a central information agency and library for computer programs developed under AEC-funding for AEC offices and contractors, U. S. government and contracting agencies, research and educational institutions, and industrial concerns consistent with guidelines established by USAEC Headquarters program divisions.

II. HISTORY

The origin of the Center goes back to the creation in 1956 of a group, known as the Nuclear Codes Group, consisting of persons interested in the development and use of computer codes for reactor design. The members met at informal sessions during semiannual American Nuclear Society meetings to discuss the latest innovations in computer hardware and current programming achievements. In addition, they met irregularly during shared sessions at the AEC UNIVAC I Computer Facility at New York University and exchanged computer programs and published, with the NYU Facility's support, a Newsletter containing abstracts of computer programs being developed by member installations. These abstracts were prepared in the format originally conceived by Radkowsky and Brodsky for their 1955 survey compilation of AEC-funded computer programming efforts.¹ This informal codes group later became the Mathematics and Computation Division of the American Nuclear Society and one of the Division's first acts in 1959 was to propose the establishment of a formal center for the collection and exchange of information on computer programs of interest to its membership. With the approval

of the Commission, Argonne National Laboratory accepted this responsibility and the Argonne Code Center was born.

Initially the Center focussed its attention on two categories of material--an abstract describing the computer program or system, its applicability and availability, and a "program package" containing the material required to effectively transfer the program to another installation or computer. A network of "cooperating installations" was set up encompassing the AEC laboratories, universities, contractor organizations, and interested industrial firms. Each installation was asked to designate a representative to serve as liaison with the Center. This representative relayed information to the Center concerning programs or requests originating within his installation and apprised his colleagues of the Center's program collection and operating procedures. The submission of the program package material was the responsibility of the program author or his installation representative. The Center prepared, or edited, the program abstracts and printed these for distribution by the American Nuclear Society office. Cooperative arrangements were made with the major computer manufacturers for them to assume the responsibility and cost of storing, reproducing, and distributing the program package material assembled by the Center. When a package was accepted for inclusion in the Center collection, it was announced in the current abstract distribution and the package material was transmitted to the appropriate computer manufacturer for inclusion in his library. Upon receipt of a program request, the Center relayed the request to the manufacturer for action. While economical, these procedures proved inadequate and in 1965 the Center was made a directly-funded operation of the Reactor Physics Branch of the Division of Reactor

Development and Technology with the program abstracts published and distributed through AEC auspices as an Argonne National Laboratory report² and the program library maintained at, and distributed from, the Center.

In 1972 the Center program was officially extended from its reactor application orientation to cover the entire spectrum of AEC activities and its scope expanded to include compilation and preparation of an AEC Computer Program Summary Report in which AEC offices and contractor installations describe computer programs and systems under development, in check-out, or in use, and plans for distribution. The installation representative concept and structure persist. The Center's program is designed to obtain the maximum benefits of AEC-funded computer program development while minimizing duplicate efforts. Each registered, or cooperating, installation is furnished a single copy of a library program package upon request. Duplicate, or additional, copies of the package documentation should be purchased from the authorized documentation centers or reproduced locally, if required.

III. CENTER ACTIVITIES

For presentation here, the Center's program has been divided into four sections: information services, program-exchange, the ACCESS computerized storage and retrieval system facilities, and cooperative efforts in standards development and related activities undertaken to promote effective program interchange.

A. INFORMATION SERVICES - This section will cover the procedures and forms used in the preparation of the AEC Computer Program Summaries, the Program Abstract, and the Program Package, and describe

briefly other information services provided by the Center and its associated network of registered installation representatives.

1. AEC Computer Program Summary Report

In the NYU Newsletters³ and early abstract distributions authors and installation representatives were urged to submit abstracts for programs as they were being specified, written, and debugged, prior to completion and packaging. Because of budget constraints, this practice was later abandoned and presently, the ANL-7411 Compilation of Program Abstracts contains abstracts only for those programs packaged, included in the Center library, and available upon request from the Center. In 1972, a separate publication was authorized. This publication, the AEC Computer Program Summary Report, will be compiled by the Center and published by the AEC Technical Information Center. The report consists of a collection of program summary forms completed by the AEC office or contractor installation responsible for the computer program or system development described. Each AEC program division is responsible for issuing guidelines defining the programs to be reported. The purpose of the report is to keep U. S. Atomic Energy Commission installations informed as to the existence, status, and availability of computer programs or systems within the agency. The standard summary form (ACCF11) appears in Appendix A together with a copy of the instructions for its preparation (ACCF12).

2. Computer Program and System Collection

The Argonne Code Center library is currently composed of programs or systems which are described in ANL-7411 and the seven supplements thereto. Although these abstract supplements are not issued on a regular basis, an effort is made to publish two issues per year as the budget permits. The library programs and abstracts are identified by the accession number assigned the program at the time the original version is received at the Center. Additional machine versions, revisions, and replacements, in general, retain this program accession number and are uniquely identified by the combination of accession number, machine identification, and version designation as required.

- a. Program Abstract - The abstract format employed by the Code Center and utilized in its ANL-7411 Compilation of Program Abstracts has evolved from the original AECU-3078 format through the efforts of the ANS-10 Standards Subcommittee, the installation representatives, and discussion with our OECD NEA Library counterpart. It contains a total of 17 items. The author, representative, or individual responsible for supplying the program package is asked to submit as a part of the package an abstract describing the program in this standard format. For additional machine versions or replacements, only the necessary additions or revisions to the existing abstract are required. The Center staff then completes and edits the abstract preparing it for publication. A draft of the edited abstract is sent to the contributor for approval.

prior to publication in ANL-7411 to ensure its currency and completeness.

Appendix B contains ACCF9, the Argonne Code Center Abstract Format form, which includes a definition of the information appropriate to each abstract item.

- b. Program Package - The program package as initially conceived includes all the material required to effectively transfer the computer program from the computer configuration used by the development installation to another installation or another configuration. It consists basically of two components: the computer-media, generally on cards or tape, and the traditional printed material, or documentation. A list of recommended program package contents includes:

Computer Media

Source decks
Run decks
Sample problem data
Data libraries
Auxiliary routines
Control information

Documentation

Program or system report
User's manual, i.e. input format and data information, operating instructions, and a description of output available, program options, etc.
Programmer's manual, i.e. program structure and logic, descriptions of subprograms, hardware requirements, system software considerations, etc.
Installation environment report, i.e. a description of the installation-dependent features of the program
Listing of the sample problem output

Each contributor is asked to supply 10 to 20 copies of the referenced documentation with the program package and to complete a release form, ACCR1, giving the Center permission to reproduce and distribute the program package material as required. It is on this form that the authoring installation specifies the distribution category for the material. The Center form, ACCF8, describing this material in more detail appears as Appendix C of this document.

- c. Classification Guide and Thesaurus - The programs and systems in the library are classified into categories on the basis of the physical problem solved or processing function performed. The present guide, included as Appendix D is indicative of the reactor orientation of the present collection. This guide will be expanded to more adequately represent the broader scope of the collection as new programs and systems are added. Category 17 of the abstract format specifies the classification category and related keywords. These keywords are drawn from the Center Thesaurus also included in Appendix D. This Thesaurus is based on the EURATOM Thesaurus which was adopted by the USAEC for the International Nuclear Information System (INIS) project; keywords may be added as required to adequately describe the contributed program or system.

3. Current Awareness and Program Search Support

Answering mail and telephone inquiries occupies a fraction of the time of all staff members. Communications run the gamut from questions

concerning information on Center procedures and activities and requests for programs or the abstract compilation to inquiries on the appropriate program for the solution of a particular problem, on the availability of specific codes, and on problems of computer implementation and hardware and software system characteristics.

Whenever a modification or replacement of an existing library program is received, an Argonne Code Center Programming Note is prepared and sent to all recipients of the original programs. These notes are also used to inform recipients when errors are detected and corrected or additional reference material is received and often issued to supplement program package documentation when the Center staff feels such supplementary information is required for effective implementation.

To keep abreast of AEC computer program development, a continuing literature search is conducted by Center personnel and card files of bibliographic information on relevant computer programs are maintained, classified both by program name and by problem or function description.

- B. PROGRAM EXCHANGE - The Center procedures have been designed for implementation on a registered installation basis. It is preferable that each AEC office, contractor installation, or other participating establishment designate an individual staff member authorized to act for their installation. This individual is recognized as the Installation Representative and each registered installation is identified by a four-character mnemonic of its

choosing providing the mnemonic has not been previously assigned.

1. The Registered Installation

As of February 1, 1973, there were 235 registered installations associated with the Argonne Code Center program. A registered installation is an AEC office, contractor, university, or industrial firm engaged in scientific and engineering activities consonant with USAEC programs and activities. The registered installation names a representative who serves as liaison with the Center and assists the Center staff in carrying out the Center programs. Each registered installation maintains on file at the Center an up-to-date listing of its computer facilities or the facilities used by it in implementing the library programs received from the Center. If Center programs are converted, corrected, improved, or errors are found, it is the responsibility of the installation representative to communicate this information to the Center. It is anticipated that converted programs will be submitted to the Center for inclusion in the library to eliminate duplicate conversion efforts. The Code Center staff will assist all program recipients in implementing Center programs in an effort to improve the library program packages. It is intended that each library package be sufficiently documented and complete to permit persons knowledgeable in both computer science and the subject matter of the program or system to implement the package on an adequate computer configuration.

Communication between the Code Center and individuals at a registered installation should be coordinated with the designated installation representative either directly or by copy of correspondence.

2. Distribution Procedures

Most of the library programs are distributed upon request. The only requirements are that the requesting installation furnish the magnetic tapes necessary for transmittal, and, if air express transmittal is desired, the requestor must specify such shipment is authorized on a COLLECT basis in his letter of request. Standard procedure is to return all requests by parcel post.

For installations outside the United States, we recommend the establishment of an account for Center use with the Plant Management Office of Argonne National Laboratory. When this account is established, it is used to purchase magnetic tape for transmittal purposes and to pay air shipment charges for sending the material to the requesting establishment. An amount of \$100-\$200 is sufficient to open such an account and the establishment is notified when the account has been depleted so that additional funding can be provided. To set up such an account, the installation representative should contact C. E. Rickleff, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, Illinois 60439, stating that his installation wishes to make a deposit with the Laboratory for Argonne Code Center use.

Some library programs are limited to United States use and for designated purposes; these are preceded by the letter R in the ANL-7411 table of contents listing. Each installation requesting a limited distribution program is required to complete a standard release form before the program package can be transmitted (ACCR2, ACCR4). Other programs may be limited to use on government contract applications only (G) or to specific authorized recipients (S). The Argonne Code Center Program Package Request form (ACCF7) is designed to facilitate ordering library programs. It provides for the contract number and contracting officer signature as required for programs limited to government contract use. These are preceded by the letter G in the ANL-7411 table of contents listing, and for the signature of the authorized recipient in the case of specific distribution list limitations. Appendix E contains copies of sample release forms in current use.

When a request for a library program is received at the Center, it is checked to see that the package has not already been sent to the installation, that any necessary release forms have been completed, and that the magnetic tapes required for the transmittal (item 16 of the abstract) have been received or can be charged to a valid installation's account. Next the transmittal tapes are labelled and dispatched, together with the appropriate forms or control information, either to the Center's 1401 or the Computer Center's IBM 360 System for processing. The documentation portion of the requested package is assembled and when the computer

processing has been completed and checked, the tapes and documentation are dispatched together with a standard letter of transmittal. Although tapes are the primary and most efficient transmittal media, cards or a program listing can be obtained, if required and requested.

3. Program Review and Validation

When program packages are received at the Center for assimilation in the Center's library, the material submitted is reviewed. A check is made to see that all subprograms and function routines called for are available. Whenever possible validation by execution of the sample problem is accomplished at the Code Center to verify its reproducibility. If installation- or system-dependent routines need to be replaced for implementation at a different site or another computer, this is noted either in abstract item 14 entitled "Other Programming or Operating Information or Restrictions" or in comments in dummy replacement routines supplied or in added documentation. After checking, the computer media portion of the package is put into a library master format for entry into ACCESS ready for distribution upon request, and the package contents are defined for inclusion in item 16 of the Program Abstract. The table of contents entry and the abstract are then prepared for publication in the next ANL-7411 supplement and a proof copy submitted to the contributor or author for approval.

4. Program Maintenance

Recipients of program packages are requested to notify the Center of implementation problems, errors detected, or modifications required to make effective use of a library program so that corrections can be made and library program packages improved. The Center is constantly striving to upgrade the library collection. All corrections or improvements are submitted to the author, or contributing installation, and with their concurrence this information is relayed to all previous code recipients via Argonne Code Center Programming Notes.

When library program packages are converted for use on other machine configurations the installation responsible for the adaptation is asked to submit a program package for the converted version. These additional machine versions are added to the Center collection and the program abstract is revised to include information on them. In this way duplicate conversion efforts can be avoided.

- C. ACCESS FACILITIES - Soon after the Laboratory acquired the IBM 360/50-75 ASP System, specifications were laid out to automate the Code Center operation and tape library. ACCESS, the Argonne Code Center Exchange and Storage System, was designed to provide storage, retrieval, modification, and terminal facilities for information utilized in the operation of the Center and the performance of Center services. Any computerized information storage and retrieval system consists basically of two components, the stored information, or data bases, and the computer

programs written to construct and maintain these files and to selectively retrieve and edit this information. ACCESS contains six interrelated, but dissimilar, data bases:

- 1) requests outstanding for computer programs or systems, (REQ),
- 2) abstracts of the library programs, (ABS),
- 3) a table of contents, or directory, of the Center's program package library, (TOC),
- 4) library program packages, i.e. the computer media component, the card or tape portion, (PKG),
- 5) installation identification and related information, (INS), and
- 6) statistics on program package transmittals, (STA).

ACCESS currently produces, in addition to the abstract compilation supplements, fiscal year reports for USAEC Headquarters, address labels for mailing abstract supplements, NEA publications, and Code Center Programming Notes, and is used to fill package requests. However, the system is still in the development stage.

- D. COOPERATIVE EFFORTS - Growing as it did in response to the recognized needs of a cooperating group of professionals, the Center retains its "cooperative" organization. The program, while centralized at Argonne, is carried out with the assistance and advice of scientists, engineers, and other professionals at the over 200 registered installations who serve as their institution's Code Center representatives. Activities undertaken with these representatives include a survey of FORTRAN IV

conversion plans for library programs and the development of the computing facilities compilation.⁴

1. The American Nuclear Society

Work with the Center's founders, the Mathematics and Computation Division of the American Nuclear Society, has been in two areas--standards and benchmark problems.

- a. Standards Development - In collaboration with the ANS-10 Standards Subcommittee, two standards have been prepared and issued, "A Code of Good Practices for the Documentation of Digital Computer Programs",⁵ which is presently under revision, and "Recommended Programming Practices to Facilitate the Interchange of Digital Computer Programs".⁶
- b. Benchmark Problem Book - In addition, the Center publishes and maintains a collection of benchmark problems⁷ compiled and edited by the Benchmark Subcommittee of the ANS Mathematics and Computation Division. These documented problems are designed for use in testing and evaluating computational algorithms and alternative machine solutions.

2. OECD-NEA Computer Programme Library

In September of 1962 a presentation of the Center program was included in an ENEA-Argonne Seminar on "New Trends in the Use of Digital Computers in Atomic Energy Research and Development" held at Argonne.⁸ As a result, the European Nuclear Energy Agency established a European counterpart of the Argonne Center

in May of 1964 at the Euratom Research Center in Ispra, Italy. Since that time the ENEA Computer Programme Library, now known as the NEA library, and the Argonne Code Center have, by international agreement, maintained and distributed each other's collection in their respective geographic areas.

IV. ROLE OF THE INSTALLATION REPRESENTATIVE

The role of the installation representative is that of liaison with the Center. The representative assists installation authors in preparing abstracts and program packages for submission to the Center, and in ordering library program packages. It is desirable for all requests for library programs from a registered installation to be submitted by the installation representative. It is the representative who is responsible for keeping the Center informed on the computer facilities in use at his establishment, and for seeing that Computer Program Summaries are prepared and submitted for programs developed there in accordance with USAEC program division guidelines.

The representative's responsibilities are described in more detail below:

- A. INSTALLATION FACILITIES REPORT - Each registered installation is asked to complete and file with the Center a facilities report, ACCF5, for each independent major processor configuration which the installation plans to utilize in implementing library programs. Since one of the primary purposes of the form is to provide the Center with sufficient information to make decisions on the best versions for your use, and applicability of library program

packages to implementation at your installation, care should be taken to indicate a preferred facility, and to complete all items. If only service bureau facilities are used, on-site terminals should be indicated along with the off-site computer configuration and its location.

A copy of ACCF5 is shown on the following pages. If more than one form is used, the installation representative information can be left blank on the additional forms.

- B. PREPARATION OF AEC SUMMARIES - The installation representative should be familiar with the AEC Computer Program Summary form and the instructions for its preparation as contained in Appendix A. The representative assists authors in completing these forms and transmits them to the Center for compilation and publication in the AEC Computer Program Summary Report.

- C. SUBMISSION OF PROGRAM PACKAGES - To guide installation representatives and authors in preparing program package material for submission to the Code Center, a document enumerating the recommended contents of a program package has been prepared (see Appendix C). In addition, a program package submittal form, ACCF6, is shown on the following page. This form identifies the submittal as a new program, a revision or replacement of an existing library program, a converted or alternate machine version of a library program, or supplementary material for a library program.

It contains space in which the author, or submitter, can specify the table of contents (KWIC) entry

ARGONNE CODE CENTER PROGRAM PACKAGE SUBMITTAL

1. Check and complete one of the following:

- NEW PROGRAM FOR _____
Machine
- NEW _____ VERSION OF _____
Machine ACC Number
- REVISION _____ OF _____ VERSION OF _____
Number Machine ACC Number
- REPLACEMENT OF _____ VERSION OF _____
Machine ACC Number
- ADDITIONAL MATERIAL FOR _____ VERSION OF _____
Machine ACC Number

2. For new programs complete the following:

Give the program name, followed by a comma, and a KWIC descriptive title (fewer than 47 characters).

Classification category: Availability: Unlimited U.S. only Govt. contract use only Special dist., list attached

3. Programming languages used:

4. Package contents included in this submission: (reference Recommended Program Package Contents, ACCF8):

- ABSTRACT (reference ACCF9) RELEASE FORM (reference ACCR1)

DOCUMENTATION (R) consisting of items listed below: No. of Copies

	Cards	or Tape
<input type="checkbox"/> SOURCE PROGRAMS (S)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> OBJECT PROGRAMS, UN LOAD MODULES (B)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> SAMPLE PROBLEM INPUT (P)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> DATA LIBRARIES (L)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> AUXILIARY MATERIAL (X)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> CONTROL INFORMATION (C)	<input type="checkbox"/>	<input type="checkbox"/>

If tapes are used for submission indicate the number of tapes, reel identification, 7- or 9-track recording, odd or even parity, density (200, 556, 800 or 1600 bpi) and then give for each reel the file structure including the character set (ASCII, BCD, EBCDIC, binary), and record format, length, and blocking factors. For IBM System 360/370 tapes the RECFM, LRECL, and BLKSIZE parameters are useful, for non-IBM tapes an indication of the maximum physical record length is helpful for variable-length records or the logical record length and blocking factor for fixed-length records. The Tape Description form, ACCF13, may be used.

5. Submitted by: _____ Date: _____
Name

_____ Telephone: _____
Address Area Number Ext.

_____ FTS: _____
City State Zip Code

**ARGONNE CODE CENTER
REGISTERED INSTALLATION FACILITIES REPORT***

NAME OF INSTALLATION: _____
PREFERRED ABBREVIATION (no more than four letters): _____
NUMBER OF MAIN PROCESSORS: _____

COMPUTER FACILITIES:

(1) MAIN PROCESSOR (computer manufacturer, model, any non-standard features):

(2) ASSOCIATED EQUIPMENT
SATELLITE OR OFF-LINE PROCESSORS (computer manufacturer, model, mode of operation, any non-standard features):

INPUT/OUTPUT CHANNELS:

MEMORY UNITS (number, manufacturer designation, capacity together with word-size or unit used, access time, cycle time or transmission rate):

CORE:

DRUM AND DISK STORAGE:

DATA CELL, RACE, OR OTHER MASS STORAGE:

PERIPHERAL UNITS (number, manufacturer designation, speed; for magnetic tape units give density, number of channels, transmission rate):

MAGNETIC TAPE UNITS:

*A separate form should be completed for each independent main processor configuration.

UNIT RECORD EQUIPMENT (card readers, punches, line printers, paper tape readers, punches, typewriters, communication terminals, data transmission equipment; give cpm, lpm, char/sec or appropriate measure of performance):

DISPLAY AND RECORDING EQUIPMENT (number, manufacturer designation, capacity, speed, for alphanumeric and graphic display devices, film and hard copy recorders):

(3) **OTHER INDEPENDENT OR SPECIAL-PURPOSE COMPUTER FACILITIES AVAILABLE AT THIS INSTALLATION:**

(4) **SOFTWARE** (programming language compilers and versions in use, operating system used, special features):

(5) **INSTALLATION ENVIRONMENT REPORTS** (references):

INSTALLATION REPRESENTATIVE: _____

MAILING ADDRESS: _____

(City)

(State)

(Zip Code)

TELEPHONE: _____ **EXTENSION:** _____

Area

Exchange

Number

FTS: _____ **DATE:** _____

and classification category he considers most appropriate for his contribution, the programming languages used, and the material enclosed. The form serves as a check list for preparing the program package, and contains the name, address, and telephone number of the person submitting the program so that he can be contacted if there are questions concerning the material.

A copy of the Code Center tape description form, ACCF13, is included; it can be used if it proves helpful to describe the contents and format of the transmittal tape.

Each submission should be accompanied by a completed release form, ACCR1, authorizing the Argonne Code Center to reproduce and distribute the program package material and prescribing the availability category as one of the following: unlimited, limited to U. S. use, U. S. government contract use, or a special distribution list.

- D. REQUESTS FOR LIBRARY PROGRAMS - While the Center will honor requests received in any form as long as the program package requested can be identified, a special form has been designed for use in submitting library package requests. This form, ACCF7, appears as page 28. It provides space for specific information uniquely identifying the program package requested, enumeration of the package material needed (if not all package components are required), and information on the transmittal media (i.e. cards, tape, listing). In addition, information essential for preparation of any necessary release forms, the requestor's name and mailing address, and any special tape requirements should be indicated in the designated locations on the form.

ARGONNE CODE CENTER TAPE DESCRIPTION

1. Reel identification:
2. Manufacturer and model identification of machine on which the tape was created:
3. Computer word-length in bits:
4. Recording: Density:
 - 7-track 200 bpi 800 bpi
 - 9 track 556 bpi 1600 bpi
5. Internal tape label:
 - No label IBM 360/370 standard label Other (please define):
6. Number of physical files on tape:
(If an IBM 360/370 standard label tape, the number of physical files is three times the number of data files.)
7. Specify for each data file on the tape the following information:

File No.	Parity (Odd or even)	Character Code (BCD, EBCDIC, ASCII, binary, other*)	Other Tapes						
			IBM 360/370 Tapes			Fixed Length Records		Variable Length Records	
			RECFM	LRECL	BLKSIZE	Logical Record Length	Blocking Factor	Max. Record Length**	No. of Records

*Define other, if used.
**Specify in units of longitudinal tape characters.

ARGONNE CODE CENTER RELEASE

I (We) the undersigned give to the Argonne Code Center permission to reproduce and distribute all or any part of the program package material on the _____ program for the _____ computer submitted to the Argonne Code Center.

SIGNED:

(Name)

(Installation)

(Address)

(City, State and Zip Code)

DATE: _____

Availability of this program package is (check one):

Unlimited

Limited to U.S. use

Use on U.S. Government contracts

Authorized requesters as listed on attachment

**ARGONNE CODE CENTER
PROGRAM PACKAGE REQUEST**

1. ACC Number: _____ Machine Version: _____
2. Program or System Identification: _____
3. If this request is for a particular subset of the package, rather than the complete package, indicate the specific categories of information needed:
- (A) Authorization (R) Documents (S) Source (B) Run Deck (P) Problem (L) Libraries
 (X) Auxiliary Material (C) Control Information
4. If this request can be filled without submission of magnetic tapes, indicate what media is desired:
- punched cards listing documentation
5. If tapes are being submitted, list the reel identification and give the date of shipment, unless shipment accompanies this form. Indicate any special tape requirements on back of this form (Item 9).
6. Availability of program package as defined by ACC (check one):
- Unlimited
- Limited to U.S. use
- Limited to Government Contract use. The material is requested by _____ Agency
for _____ Contractor use on _____ Contract Number

Signature of Government Contracting Officer
- Limited to authorized recipients. This request is authorized by:
- _____
Signature of Authorized Recipient _____
Installation
7. If limited distribution, and location of use is different from address of requester, complete the following:
- Location of use: _____ Access via: _____
- _____
Name of Establishment _____
Equipment (i.e., I/O terminal, station)
- _____
Street Address at _____
Company
- _____
City, State, Zip Code _____
Address
8. Request submitted by: _____ Date: _____
Name
- _____
Installation Telephone: _____
Area Number Ext
- _____
Address FTS: _____
9. Special Installation Tape Requirements (indicate 7- or 9-track recording, odd or even parity, density of 200, 556, 800 or 1600 bpi, and character set, record length, or blocking factor restrictions pertinent to your computer facilities). Standard transmittal for non-IBM programs: 7-track 556 bpi recording with BCD records even parity in unblocked 00-character card-image format and binary records as received from the originating installation. Standard transmittal for IBM 360/370 programs is 9-track 800 bpi recording with EBCDIC records odd parity RECFM=FB, LRECL=80, BLKSIZE=3200, and other records as received from the originating installation.

APPENDIX A
AEC Computer Program Summary Form
and Instructions for Its Preparation
(ACCF11, ACCF12)

AEC COMPUTER PROGRAM SUMMARY			
DATE: 1.	AUTHOR/CONTACT: 2.	CATEGORY: 3.	
PROGRAM IDENTIFICATION AND KWIC TITLE: (fewer than 47 characters) 4.			
AEC/CONTRACTOR: 5.	FUNDING DIVISION: 6.	STATUS: 7. SPECIFICATION <input type="checkbox"/> DEVELOPMENT <input type="checkbox"/> CHECKOUT <input type="checkbox"/> IN USE <input type="checkbox"/> PACKAGED <input type="checkbox"/>	
COMPUTER: 8.	PROGRAMMING LANGUAGE(S): 9.	PROGRAM SIZE: 10.	
PROGRAM/SYSTEM SUMMARY: 11.			
REFERENCE(S): 12.			
AVAILABILITY: 13.			
DISTRIBUTION: <input type="checkbox"/> UNLIMITED <input type="checkbox"/> U.S. ONLY <input type="checkbox"/> GOVERNMENT CONTRACT APPLICATIONS ONLY 14. <input type="checkbox"/> SPECIAL			

ACCF11

ARGONNE CODE CENTER

Instructions for Preparation of AEC Computer Program Summaries

1. **Date**—Enter current date in the form year/month/day.
2. **Author/Contact**—Give the name of the author of this computer program or system, and the name of the individual responsible for the program or system, if different from the author.
3. **Category**—Specify the program classification category that best describes the class of physical problem solved or the data processing activity performed. Current Code Center categories are listed in the Center Classification Guide; indicate suggested category if none seem applicable.
4. **Program Identification and KWIC Title**—List the program or system name followed by a comma and a limited descriptive title intended for use as a Key-Word-In-Context entry. This information is restricted to a length of fewer than 47 characters, including blanks.
5. **Contractor**—Indicate the name and address of the AEC or contractor installation responsible for the program or system development. This should be the location where the author and/or contact can be reached. If different, it is essential that item 2 contain address information.
6. **Funding Division**—Identify the AEC division(s) which funded the program development effort. Use standard abbreviations; e.g., RDT for Reactor Development and Technology, MA for Military Applications.
7. **Status**—Check one of the five boxes indicating the current status of the program or system, i.e., specification, development, checkout, in use, or packaged.
8. **Computer**—Identify the computer system on which the program is developed. Both the hardware (IBM 360/165, CDC 7600, UNIVAC 1108, etc.) and the software (US/MVT, SCOPE 2.0, EXEC 8, etc.) should be listed. If specific devices such as microfilm recorders or plotters are utilized, these should be listed.
9. **Programming Language(s)**—Indicate the programming languages in which the program or system is written and if more than one language is utilized, estimate the fraction of each.
10. **Program Size**—Provide an estimate of the magnitude and complexity of the system or program, e.g., give the number of cards or source language statements.
11. **Summary**—Describe briefly the physical problem solved or the system functions and tasks performed, input data required, output available, mathematical method or model, algorithms employed, restrictions on problem size, range of parameters, accuracy, special features, processing cycle, etc.
12. **References**—List bibliographic citations to the pertinent published literature and reference by number earlier summaries on this program or system, if any have been published.
13. **Availability**—Enumerate the program package material available and the source of this material.
14. **Distribution**—Check which of the four distribution policies is to be followed in making the program package material available.

Items 12, 13 and 14 may or may not be included; all other items are required.

Send to: ARGONNE CODE CENTER, BLDG. 221
 ARGONNE NATIONAL LABORATORY
 9700 SOUTH CASS AVENUE
 ARGONNE, ILLINOIS 60439

APPENDIX B
Argonne Code Center
Abstract Format
(ACCF9)

ARGONNE CODE CENTER

ABSTRACT FORMAT

1. **Name or Designation of Program**—This is the name or designation given the program by its author.
2. **Computer for Which Program Is Designed and Others upon Which It Is Operable**—The computer hardware system for which the program or system was prepared is identified and names of other computers for which versions are available are listed.
3. **Description of Problem or Function**—A brief description of the problem being solved or a definition of the data processing activity being carried out is given.
4. **Method of Solution**—A short summary of the mathematical methods employed, numerical algorithms adopted, or procedures incorporated in the program should appear under this entry.
5. **Restrictions on the Complexity of the Problem**—This item includes restrictions implied by storage allocation, such as maximum number of energy groups and mesh points, as well as those due to approximations used, etc.
6. **Typical Running Time**—Information intended to enable the user to estimate machine time requirements is listed.
7. **Unusual Features of the Program**—Distinguishing features and special capabilities of the program are enumerated. Information given under this item should allow the user to select, from a number of similar programs, the one most suitable for his particular problem.
8. **Related and Auxiliary Programs**—If this program supersedes or is an extension of an earlier program, this is noted here. Programs used in conjunction with this program, especially those coupled through use of external data files should be mentioned.
9. **Status**—The Center lists here the initial date of publication of the abstract. Versions in the library are identified and the date they were submitted is given. Any testing completed at the Center is noted.
10. **References**—Available publications pertinent to the program are cited.
11. **Machine Requirements**—This item lists the hardware components essential for full utilization of the program.
12. **Programming Language(s) Used**—The programming language or languages in which the program was written are identified with an indication of the percentage of each used. If certain routines are in assembly rather than compiler language, these should be identified.
13. **Operating System or Monitor under Which Program Is Executed**—This item identifies the operating system, associated subroutine or function library, and installation support software used by the program. The version used is identified and deviations or exceptions noted.
14. **Other Programming or Operating Information or Restrictions**—Additional information needed by the reader to implement the program or determine the extent of the necessary implementation effort is summarized.
15. **Name and Establishment of Author**—The names and addresses of the authors of the program and of other machine versions are listed. If the author is no longer responsible for the program, the person to be contacted should be listed, as well.
16. **Material Available**—This lists the material being distributed, i.e., the contents of the program package.
17. **Category**—The problem classification assigned from the Center program or system classification guide.
Keywords—This is a listing of the keywords associated with the program, supplied by the program author and/or Center based on the Argonne Code Center thesaurus.

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APPENDIX C
Argonne Code Center
Recommended Program Package Contents
(ACCF8)

ARGONNE CODE CENTER

RECOMMENDED PROGRAM PACKAGE CONTENTS

The "program package" is defined as the collection of card decks, tapes, and documentation, associated with a computer program, necessary for its modification and effective use by an individual other than the author on a computer system different from that on which it was developed.

The material required may include all of the following:

1. **Source Decks (S)**—Compiler and assembly language program decks or card-image tape records.
2. **Run Decks (B)**—Language processor object decks, or load modules, prepared as required for program execution. If source decks cannot be distributed for proprietary or other reasons, run decks may be substituted. For certain system-dependent programs this may be the preferable form, and in interchange between users of like systems, it provides redundancy when used in conjunction with the source material.
3. **Sample Problems (P)**—Test case input data decks or card-image tape records for use in checking out program implementation.
4. **Data Libraries (L)**—External data files required for program operation; e.g., cross-section libraries, steam table data. It is preferable that decimal form be used for numerical data files for exchange purposes.
5. **Control Information (C)**—Operating system control cards or control language decks required for compilation or assembly of the program and execution of the sample problem at the originating installation. This information includes device assignments, storage allocation, overlay structure definitions, etc.
6. **Auxiliary Routines (X)**—Program package items for subsidiary programs used in preparing input information, processing results, maintaining data libraries, etc. for the program.
7. **Documentation (R)**—The traditional documentation associated with the computer program and its application. This material may be compiled in a single comprehensive report or it may exist as several independent documents—published paper reprints, program reports, user's manuals, program maintenance manuals, installation memoranda, computer output listings, etc. It may, regardless of form, include all of the following:
 - a. *Problem definition or function description*—Information providing the *raison d'être* for the computer program or system, a description of the problem solved or of the processing performed. A description of the mathematical model used and the computational algorithms and techniques employed should be included.
 - b. *Application information*—Documentation directed to the program user; i.e., a User's Manual, if a separate publication. Operating Instructions, program options, and a description of the input and output formats should be covered in sufficient detail to enable the user to specify his own problem and interpret the results correctly. An example is helpful; if the identical sample problem of item 3 is used the selected output for it can be shown in this document; otherwise, it is essential to include a copy of the computer output listing obtained from execution of the item 3 sample problem in the program package.
 - c. *Programming information*—A detailed description of the program addressed to the programmer responsible for maintenance or transfer of the program; i.e., a Program Maintenance Manual, if a separate publication. Material covered should include the overall program structure and logic, identification of subprograms and detailed information on their use, glossaries showing the relationship between problem variables and program symbols, definitions of external data files, system hardware and software requirements, shared storage assignments, overlay or segment structures, and system-dependent programming considerations.
 - d. *Installation environment information*—A description of the environment in which the program was developed and installation support facilities utilized such as installation-dependent library routines for mathematical functions, plotting, microfilm recording and the like. It is recommended that general Installation Environment Reports issued by individuals responsible for the computer environment at the program-originating installation be utilized for this part of the program documentation. Such documents can greatly simplify the preparation of portable program packages and facilitate effective program exchange.

Program package items 1 through 6 are most effectively maintained and transmitted in punched card or magnetic tape form; item 7 as printed material. If a substantial number of cards are involved, these should be recorded on magnetic tape in card-image format. Data libraries (item 6) are often computer-generated and exist only on tape. Control information (item 5) may, alternatively, be supplied as a computer output listing since this information is rarely identical at different installations.

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APPENDIX D
Argonne Code Center
Program or System Classification Guide
and Thesaurus
(ACCF10, ACCF15)

ARGONNE CODE CENTER
PROGRAM OR SYSTEM CLASSIFICATION GUIDE

- A. **Cross Section and Resonance Integral Calculations**—Computation of reaction cross sections from nuclear theory such as the optical or Hauser-Feshbach models, resonance cross sections by Breit-Wigner or multilevel theory, determination of differential scattering cross sections, cross-section evaluation and compilation programs.
- B. **Spectrum Calculations, Generation of Group Constants, Lattice and Cell Problems**—Determination of the slowing-down density or thermal spectrum, weighting and averaging of cross sections and related quantities for the production of group constants, and evaluation of design parameters by lattice and cell calculation.
- C. **Static Design Studies**—Calculation of the reactivity and flux distribution of the reactor system, and adjustment of design parameters to prescribed specifications; i.e., criticality and power distribution search procedures.
- D. **Depletion, Fuel Management, Cost Analysis, and Reactor Economics**—Includes burnup programs, isotope and fission product buildup and decay computations, and optimization studies.
- E. **Space-Independent Kinetics**—Studies of the time-behavior of reactors including delayed neutron effects and feedback mechanisms, and transfer function evaluation.
- F. **Space-Time Kinetics, Coupled Neutronics-Hydrodynamics-Thermodynamics and Excursion Simulations**—Programs which consider spatial design characteristics and accompanying effects in studying the time-behavior of the reactor.
- G. **Radiological Safety, Hazard and Accident Analysis**—Calculation of internal and external dose rates, determination of reactor thermodynamic and hydrodynamic properties following an accident, i.e., release of radioactive materials, coolant system blowdown, steam generator rupture.
- H. **Steady-State and Transient Heat Transfer**—Includes fluid flow studies and calculations of thermodynamic properties.
- I. **Deformation and Stress Distribution Computations, Structural Analysis and Engineering Design Studies**—Includes fuel-element design evaluations, core-configuration studies, and composite structure analysis.
- J. **Gamma Heating and Shield Design Programs**—Computation of heat-generation rates, and penetration analysis and leakage calculations for reactor shields.
- K. **Total Reactor Systems Analysis**—Combinations of programs solving correlated problems in categories A through I.
- L. **Data Preparation**—Generation of program parameters; checking, editing and formatting of problem input information.
- M. **Data Management**—Construction, maintenance and retrieval of data files, e.g., cross-section libraries; management systems such as payroll and personnel systems, accounting and budgeting systems, property and equipment systems, production and inventory control, indexing and retrieval systems, etc.
- N. **Subsidiary Calculations**—Plotting, editing and display routines which process output data from other programs.
- O. **Experimental Data Processing**—Programs designed to process data directly acquired from an experimental situation or to assist experimenter in the design of the experiment.
- P. **General Mathematical and Computing System Routines**—Calculation of mathematical functions, special-language routines with general data-processing capabilities, software systems.
- Q. **Materials**—Measurements and computation of the physical and mechanical properties of materials, simulation of radiation damage processes, corrosion studies, determination of crystallographic functions.

- R. **Meteorology**—Calculations relating to the atmosphere and its phenomena, studies of airborne particulate matter, climatology, etc.
- S. **Space Sciences**—Analysis of orbits and trajectories, astronomy and astrophysics computations, wave propagation studies and the calculation of reentry parameters.
- T. **Electronics and Engineering Equipment**—Automated design of electronic equipment, engineering computations for numerically controlled machine tools and process control programs.
- U. **Chemistry**—Chemical analysis, mass spectroscopy, radiation chemistry, radiolysis studies, etc.
- V. **Particle Accelerators and High Voltage Machines**—Programs relating to the design, development and operation of high-voltage machines and particle accelerators such as Van de Graaff generators, linear accelerators, cyclotrons, synchrotrons, etc.
- Z. **Data**—Data prepared in specific program formats for program testing and evaluation, benchmark studies, or library use.

ARGONNE CODE CENTER

Thesaurus

1-dimensional	differential equations	heterogeneous
1-group	diffusion	hexagonal
2-dimensional	disadvantage factors	homogeneous
2-group	distance	hydrodynamics
3-dimensional	distribution	incoherent approximation
absorption	Doppler broadening	inelastic
accidents	Doppler coefficient	infinite media
activation	dose rates	input data
aerosols	dynamics	instantaneous release
age	economics	isotopes
alpha decay	efficiency	isotropic scattering
angular distribution	elastic	kinetics
anisotropic scattering	elasticity	lattices
annular space	electrons	leakage
assembler	ENDF/B	least squares
atmosphere	enthalpy	Legendre coefficients
averages	epithelial	libraries
B _L method	equations	lifetime
background	excursions	light
beams	expansion	liquids
blowdown	factor	liquid metals
Breit-Wigner formula	failures	magnetic
breeding	fast	maintenance
Brown-St. John model	feedback	mass matrices
buckling	few-group	Maxwell distribution
capture	finite-element	measurements
cell calculation	fission	minimization
coefficients	fission products	moderators
Cohen equation	fluid flow	Monte Carlo method
coincidence methods	fluids	multidimensional
compound nuclei	flux	multigroup
containment	Fourier transform	multilevel
continuous release	frequency	neutrons
control	fuel cycle	noise
control rods	fuel elements	nonlinear
coolants	fuels	numerical calculations
correlation	gamma radiation	operating systems
criticality	gas coolants	operation
cross sections	gases	optical model
crystals	geometries	output data
currents	graphs	parameters
cylinders	group constants	particles
Dancoff correction	Hauser-Feshbach theory	performance
data processing	heat conduction	perturbation theory
decay	heat transfer	photomultipliers
deformation	heating	photon
depletion	heavy	pipes
design	helium	P _L method

plates
 poison
 polarization
 polynomials
 potential scattering
 power
 power plants
 preparation
 pressure
 production
 programming languages
 pumps
 r -theta
 r -theta- z
 r - z
 radiation effects
 radioactivity
 reaction rates
 reactivity
 reactor safety
 reactors
 resolved region
 resonance
 resonance escape probability

resonance integrals
 retrieval
 scattering
 scattering law
 scintillation counters
 searches
 Selengut-Goertzel equation
 shells
 shielding
 slabs
 slowing down
 S_N method
 solids
 solutions
 space
 space-independent
 space-time
 spectra
 spheres
 statistics
 steam generators
 stresses
 structural analysis
 swelling

synthesis
 temperature
 temperature coefficient
 thermal
 thermal utilization
 thermalization
 thermodynamics
 transfer functions
 transients
 transport theory
 triangular
 unresolved region
 vapors
 variations
 velocity
 vibrations
 viscoelasticity
 water
 weight
 Wigner-Wilkins model
 Wilkins equation
 x - y
 x - y - z
 xenon

APPENDIX E
Argonne Code Center
Release Forms
(ACCR2, ACCR4)

ARGONNE CODE CENTER

Naval Reactors Computer Program Transmittal Release

I, the undersigned, being a United States citizen, and representing the installation indicated, request the Argonne Code Center to release the program package for _____ Abstract _____, to me. I certify that this material, or copies thereof, will be used only at the location listed below, that this location is in the United States of America, that if use is desired at other U.S. locations, I will execute a separate release form for each location, and that the use of the material will be limited to either official U.S. Government or commercial (non-military) applications. I further understand that the material has not been approved for public release and that its distribution, without specific Governmental authorization, to U.S. nationals representing foreign interests, foreign nationals, foreign governments, foreign companies and foreign subsidiaries or foreign licensees of U.S. companies is specifically prohibited.

Should I modify or convert this program to operation on another computer I understand distribution of the modified or converted version must be handled only by the Argonne Code Center under the same restrictions as govern this original package material.

(Signed) _____ (Name) _____ (Installation) _____

(Address) _____ (City, State and Zip Code) _____

LOCATION OF USE, IF OTHER THAN SIGNATORY'S INSTALLATION

(Installation)

(Address) _____ (City, State and Zip Code) _____

DATE: _____

ARGONNE CODE CENTER

Computer Program Transmittal Release

I, the undersigned, being a United States citizen, and representing the installation indicated, request the Argonne Code Center to release the program package for _____, Abstract _____, to me. I certify that this material, or copies thereof, will be used only at the location listed below, that this location is in the United States of America, that if use is desired at other U.S. locations, I will execute a separate release form for each location, and that the use of the material will be limited to either official U.S. Government or U.S. commercial (non-military) applications. I further understand that the material has not been approved for public release and that its distribution, without specific Governmental authorization, to U.S. nationals representing foreign interests, foreign nationals, foreign governments, foreign companies and foreign subsidiaries, or foreign licensees of U.S. companies is specifically prohibited.

Should I modify or convert this program to operation on another computer I understand distribution of the modified or converted version must be handled only by the Argonne Code Center under the same restrictions as govern this original package material unless, after review, I am advised by the Argonne Code Center that the restrictions are not applicable to the converted program.

(Signed) _____ (Name) _____ (Installation)

_____ (Address) _____ (City, State and Zip Code)

LOCATION OF USE IF OTHER THAN SIGNATORY'S INSTALLATION

_____ (Installation)

_____ (Address) _____ (City, State and Zip Code)

DATE: _____

REFERENCES

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