

# SHARE

PROGRAM LIBRARY AGENCY

User's Guide  
and  
Catalog of Programs

1977 EDITION

Triangle Universities Computation Center

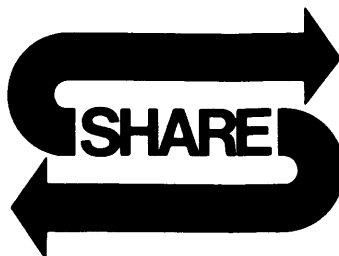
Research Triangle Park, N.C.

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USER'S GUIDE AND CATALOG

January 1, 1977

SHARE INC.

The principal purpose of SHARE Inc. is to foster the development, free exchange, and public dissemination of research data pertaining to SHARE computers in the best scientific tradition. To achieve these ends, SHARE conducts meetings, discussion groups, forums, panels, lectures, and other similar programs concerned with the development and exchange of research and technological data. SHARE publishes the results of its scientific research through its SHARE Secretary's Distribution (SSD) and other publications and makes such publications available to the interested public on a noncommittal and non-discriminatory basis. SHARE attempts to establish and continually improve standards for communicating computer scientific research and programming information to interested members of the public. All inquiries and requests to SHARE, other than for programs and their associated documentation elements, should be directed to:

SHARE Inc.  
111 East Wacker Drive  
Chicago, IL 60601  
Telephone: (312) 822-0932

The SHARE Program Library Agency

The SHARE Program Library is a collection of generally useful programs created and administered to promote the exchange of technical information, to lower software development costs, and to help avoid redundant effort. Programs and their documentation are made available to all at distribution costs. The SHARE Program Library Agency (SPLA) is operated on a non-profit basis by the Triangle Universities Computation Center (TUCC) for SHARE Inc.

TUCC serves as the distribution agent for contributed programs and does not test or maintain the programs. Programs and documentation are distributed in the original form as submitted by the author. Neither TUCC nor SHARE Inc. makes any warranty, expressed or implied, as to the documentation, function, or performance of contributed programs.

## HOW TO ORDER FROM SPLA

### General Procedures

SHARE membership is not required to order programs from the Library. The price for programs is the same for both SHARE members and non-SHARE members.

All orders should be accompanied by either a purchase order or payment.

When ordering from SPLA, please send all materials relevant to an order (e.g., purchase orders, checks, order forms, etc.) in the same envelope. This is necessary to prevent duplication of orders.

A \$5.00 handling fee is charged on all orders that are not prepaid.

All orders from outside the North American Continent must be prepaid.

All shipments will be sent via airmail (first class for U.S.A.), postpaid.

Telephone orders cannot be accepted.

All orders should be written on a SPLA order form (contained in this catalog) and sent to the following address:

SHARE Program Library Agency  
Triangle Universities Computation Center  
Post Office Box 12076  
Research Triangle Park, NC 27709  
Telephone: (919) 549-0671 (ext. 283)

### Program Orders

The standard distribution includes one copy of all machine-readable material and one copy of the documentation (some documentation is in machine-readable form only).

Only programs in the 360D, 370D, 360E or 1130 series, as indexed in this catalog, are currently shipped by SPLA.

The price of a standard distribution is \$35.00 per program for orders from the North American Continent, and \$40.00 per program for all others. Other applicable charges are listed below:

- The number of pages of documentation is listed at the bottom of each program abstract. An additional charge of \$ .05 per page is made for each page over 20 pages.
- Machine-readable material is available on 9-track 800 or 1600 bpi tapes. Do not send tapes; SPLA will provide all required materials as part of the distribution.

- Some programs require a tape longer than 600'; this is noted at the bottom of the program abstract. There is an additional charge of \$5.00 per 600' (tapes are available in 600', 1200', and 2400' only).
- Punched cards may be requested for programs for which the number of cards does not exceed 1,000; a tape will be substituted for any program requiring more than 1,000 cards (except by special arrangement). Some programs include files which are not suitable to punched card distribution, e.g., print files. The availability of punched cards is noted at the bottom of each abstract.

#### Documentation Only Orders

Documentation can be ordered at a cost of \$5.00 per document plus \$ .05 per page for all pages over the first 20.

Some documentation is in machine-readable form only and is unavailable as "documentation only".

Documentation availability and a page count are given at the bottom of each program abstract.

#### SHARE Catalog Orders

Copies of the SHARE Program Library User's Guide and Catalog of Programs are available through SPLA at a cost of \$10.00. Catalogs ordered from SPLA include 4 update mailings on a calendar year basis. If an update has been mailed prior to a catalog order, the update will be shipped with the catalog.



SHARE PROGRAM LIBRARY AGENCY

ORDER FORM

Date: \_\_\_\_\_

Ship To: _____	Invoice To: _____
_____	_____
_____	_____
_____ Zip _____	_____
Attention: _____	_____

Program Number(s):	Dist Medium
1	
2	
3	
4	
5	
6	

Distribution Medium:  
 DO Documentation Only  
 CC Cards (Check catalog for availability)  
 T1 9-track 800 BPI  
 T2 9-track 1600 BPI

ORDER AUTHORIZED BY: \_\_\_\_\_  
 TITLE: \_\_\_\_\_

SPLA USE ONLY.	RUN NO. _____
Date Rec'd: _____	Date Shipped: _____
Remittance Rec'd with Order: _____	
Invoice No: _____	

Send This Form & Remittance To:  
 SHARE Program Library Agency  
 Triangle Universities Computation Center  
 Post Office Box 12076  
 Research Triangle Park, North Carolina 27709

Note: A \$5.00 handling fee will be charged if remittance is not enclosed. All overseas orders must be prepaid. Do not send tapes. All materials will be supplied by SPLA. One copy (only) of printed documentation will be provided for each program ordered.

SPLA FEE SCHEDULE

(Effective July 1, 1976)

Program Distribution Fee (per program) - North American Continent	\$35.00
Program Distribution Fee (per program) - Overseas ( <u>must</u> be prepaid)	<u>\$40.00</u>

Includes:

Prepaid air mailing

Documentation (up to 20 pages)

Magnetic tape (600') (Cards may be substituted when fewer than 1,000).

Documentation (only) Fee (up to 20 pages)	<u>\$ 5.00</u>
---	----------------

Catalog Subscription (annual)	<u>\$10.00</u>
-------------------------------	----------------

Current catalog and four updates

Additional Charges:

Documentation in excess of first 20 pages (per page)	<u>\$ .05</u>
--	---------------

Handling charge (if not prepaid)	<u>\$ 5.00</u>
----------------------------------	----------------

Magnetic tape in excess of 600' (per 600')	<u>\$ 5.00</u>
--	----------------

Media and services not listed will be quoted upon request.

## SUBMITTAL OF PROGRAMS TO THE SHARE LIBRARY

Submittal of programs is no longer restricted to SHARE member installations provided that certain standards are met. The Library endeavors to distribute well-documented useful programs. For this reason, certain items must be included with each submittal. A complete program package includes:

- Completed and signed SHARE Library Submittal Form;
- Acknowledgement of Assistance Statement;
- Program Documentation (machine-readable preferred);
- Source Program;
- Sample Problem(s).

At the author's discretion, the following items may also be submitted:

- Object program - specify system release and type;
- Flowcharts.

The above items will be discussed in greater detail in the following sections. Questions, comments, or suggestions concerning these requirements or the SHARE Program Library at TUCG may be addressed to the SHARE Program Library Project Manager as listed in Section 1.0 of the SHARE Reference Manual.

Completed submittal packages should be mailed to SPLA at the following address:

SHARE Program Library Agency  
Triangle Universities Computation Center  
Post Office Box 12076  
Research Triangle Park, NC 27709

The availability of these programs is announced via the SHARE Program Library User's Guide and Catalog, published as a special edition of the SSD. Periodic supplements and announcements will be included in the back of the regular SSDs. These supplements are also sent to purchasers of the SHARE Catalog.

## SUBMITTAL REQUIREMENTS

### Program Submittal Form

Each program submitted must include a completed and signed SHARE Program Library Submittal Form. Blank forms with instructions for completion are available from the Library. A copy of this form is shown at the end of this section.

The program submittal form is reproduced as part of the distributed program package.





- Limitations -- range, accuracy, floating or fixed numbers, restrictions and dependencies on other programs.
- Environment requirements.
- Input/Output -- description and layouts.
- Instructions on how to use the program (control cards, data structure, etc.).
- Statement indicating the amount of testing and how the program has been used prior to submission. Include a description of the test data.
- Table of Contents (helpful in long documentation and User's Manuals).

### Program

Program submittals are accepted in magnetic tape form only.

### Tape Key

A tape key is required and should list the title and description of each file, followed by the data record length, blocking factor, and block length. Specify the mode of each file, e.g., Binary EBCDIC, etc. If relevant, indicate the standard IBM utility program which can be used to punch a deck or print a listing. Also specify the control card information for the utility program.

Please specify the exact number of tape marks on the tape. When reproducing the tape for distribution, SPLA utilizes the tape mark count in controlling the amount of data to be copied.

### EXAMPLE: Tape Key

This volume contains 3 Files and 3 Tape Marks arranged as follows:

File 1 Assembled Object Deck  
 EBCDIC  
 Sequence 0001 through 0200 in cols. 77-80;  
 PRG in cols. 73-75; 200 cards  
 200 card images blocked 20 per block  
 10 blocks of 1600 characters each  
 T/M

File 2 Sample Data Input  
 EBCDIC  
 SMPL in cols 77-80; 160 cards  
 8 blocks of 1600 characters each  
 T/M

File 3 Program Source Deck  
Sequence 0001 through 1160 in cols. 77-80;  
SPRG in cols. 73-76; 1160 cards  
1160 card images blocked 20 per block  
58 blocks of 1600 characters each  
T/M

NOTE: The tape key portion of the program documentation should not specify recording track and density since these options may be specified by persons ordering programs from SPLA. However, the original submittal tape should be labeled with this information.

#### Sample Problem

A sample problem is defined for purposes of these standards as a set of test inputs to the program and the corresponding output from the program. Listings of the sample input and output data should be included when meaningful.

#### Program Package Revisions

The submittal of program revisions must always be accompanied by a new SHARE Program Library Submittal Form and identified as a REVISION in Item 8 of that submittal form. A completely new program package must be submitted.

**SHARE PROGRAM LIBRARY SUBMITTAL FORM**



SHARE PROGRAM LIBRARY AGENCY  
Triangle Universities Computation Center  
Post Office Box 12076  
Research Triangle Park, North Carolina USA 27709

SPLA CONTROL NUMBER: \_\_\_\_\_

This form should be completed and submitted with the program package to the SHARE Program Library Agency at the address shown above. Standards and instructions for submitting programs are in the SHARE Reference Manual, Section 6.

(1) Program Number (to be filled by SPLA) . . . . . \_\_\_\_\_

(2) Title of Program . . . . . \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(3) System Type(s) (Machine). . . . . \_\_\_\_\_

(4) Search Key(s) . . . . . \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(5) Programming Systems/Languages . . . . . \_\_\_\_\_

(6) Primary Subject Code . . . . . \_\_\_\_\_

(7) Minimum System Requirements \_\_\_\_\_

(8) New (N) or Revision (R) (if revision, show prior Program Number in Item 1) \_\_\_\_\_

(9) Date of Submittal . . . . . \_\_\_\_\_

(10) Documentation (number of original pages submitted) . . . . . \_\_\_\_\_

(11) Author's Name and Address . . . . . \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(12) Direct Technical Inquiries to Name & Address  
(if different than Author) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(13) Submitter's Installation Membership Code . . . . . \_\_\_\_\_

(14) Abstract (should contain sufficient information for a reader to determine the value of the program). Listed on the reverse side of this form are subjects which may serve as a guide for a descriptive abstract.

## SHARE PROGRAM LIBRARY SUBMITTAL FORM

**Subject Guide:**

- a. Purpose
- b. Programming Language used
- c. Version and modification level or release number
- d. Field of application
- e. Type of routine (main program, subroutine, etc.)
- f. Specific description of machine requirements

(Please attach additional pages if necessary) . . . . . Total pages attached _____

An "Acknowledgement of Assistance" statement must be attached to this Submittal Form.

**Permission to Publish**

"I hereby give the SHARE Program Library Agency permission to reprint, reproduce, and distribute this program"

(15) Signature of Submitter and Date \_\_\_\_\_

(15) Signature of Installation Addressee \_\_\_\_\_

## CLASSIFICATION CODES

- |   |  |
|---|--|
| <p>00. Utility (External) Programs</p> <ul style="list-style-type: none"><li>0 Unclassified</li><li>1 Multiple Utility</li><li>2 Flowcharting</li><li>3 Tape Handling</li><li>4 Disk Handling</li><li>5 Drum and Direct Data Devices</li><li>6 Graphic Display Devices</li></ul> <p>01. Utility (Internal) Programs</p> <ul style="list-style-type: none"><li>0 Unclassified</li><li>1 Loading</li><li>2 Clear/Reset Memory</li><li>3 Check Sum Accumulative and Correction</li><li>4 Internal Housekeeping</li><li>5 Dump to Reload/Restore Operations</li><li>6 File Organization</li><li>7 Self Checking Digit</li><li>8 Packed Data Handlers</li></ul> <p>02. Diagnostics</p> <ul style="list-style-type: none"><li>0 Unclassified</li><li>5 Status Recorders</li></ul> <p>03. Programming Systems</p> <ul style="list-style-type: none"><li>0 Unclassified</li><li>1 Assemblers</li><li>2 Compilers</li><li>3 Interpretive Systems</li><li>4 Input/Output Control</li><li>5 Report Generators</li><li>6 Preprocessing and Editing</li><li>7 Macros and Macro Generators</li><li>8 Functions and Subroutines</li></ul> <p>04. Testing and Debugging</p> <ul style="list-style-type: none"><li>0 Unclassified</li><li>1 Dumping</li><li>2 Tracing</li><li>3 Test Data Preparation</li><li>4 Testing Systems</li><li>5 Break Point Printing</li><li>6 Memory Verification and Searching</li></ul> | <p>05. Executive Routines</p> <ul style="list-style-type: none"><li>0 Unclassified</li><li>1 Monitor</li><li>2 Supervisor</li><li>3 Disassembly and Derelativizing</li><li>4 Relativizing</li><li>5 Relocation</li></ul> <p>06. Data Handling</p> <ul style="list-style-type: none"><li>0 Unclassified</li><li>1 Sorting</li><li>2 Merging</li><li>3 Data Transmission</li><li>4 Tape Operations</li><li>5 Conversion and/or Scaling</li><li>6 Character and Symbol Manipulation</li><li>7 Information Classification, Storage, and Retrieval</li><li>8 List Processing</li><li>9 Bit String</li></ul> <p>07. Input</p> <ul style="list-style-type: none"><li>0 Unclassified</li><li>1 Binary</li><li>2 Octal</li><li>3 Decimal</li><li>4 BCD</li><li>5 Hexadecimal</li><li>6 Composite</li></ul> <p>08. Output</p> <ul style="list-style-type: none"><li>0 Unclassified</li><li>1 Binary</li><li>2 Octal</li><li>3 Decimal</li><li>4 BCD</li><li>5 Hexadecimal</li><li>6 Plotting</li><li>7 Display</li><li>8 Composite</li></ul> <p>09. Service Routines; Programming Aids</p> <ul style="list-style-type: none"><li>0 Unclassified</li><li>1 Program Timers</li><li>2 Interrupt Handlers</li><li>3 Source Language Programming Aids</li></ul> |
|---|--|

10. Systems Analysis
- 0 Unclassified
  - 1 Network Design
  - 2 File and Core Requirement
  - 3 Systems Design
  - 4 Configurator
11. Simulation of Computers and Components
- 0 Unclassified
  - 1 Computers
  - 2 Peripheral Equipment
  - 3 System Component or Feature
  - 4 Pseudo-Computer
12. Conversion of Programs and Data
- 0 Unclassified
  - 1 Data Conversion
  - 2 Computer Language Translators
13. Statistical
- 0 Unclassified
  - 1 Descriptive
  - 2 Univariate and Multivariate Parametric
  - 3 Non-Parametric
  - 4 Time Series and Auto Correlation
  - 5 Probability Distribution Sampling, and Random Number Generators
  - 6 Correlation and Regression Analysis
  - 7 Analysis of Variance and Covariance
  - 8 Sequential Analysis
  - 9 Discriminant Analysis
14. Internal Information Transfer
- 0 Unclassified
  - 1 Drum
  - 2 Disk
  - 3 Tape
  - 4 Relocation
  - 5 Direct Data Devices
15. Management Science/Operations Research
- 0 Unclassified
  - 1 Simulations
  - 2 Linear Programming
  - 3 Non-Linear Programming/Constrained Optimization
  - 4 Scheduling/Critical Path/Pert/Less
  - 5 Games, Game Like Models and Game Theory
  - 6 General Problem Solvers
  - 7 Inventory Control
  - 8 Transportation and Network Codes
16. Engineering
- 0 Unclassified
  - 1 Aeronautical
  - 2 Civil
  - 3 Chemical
  - 4 Electrical
  - 5 Mechanical and Hydraulic
  - 6 Petroleum
  - 7 Nuclear
  - 8 General
17. Sciences
- 0 Unclassified
  - 1 General
  - 2 Nuclear Physics
  - 3 Chemistry
  - 4 Geology, Oceanography, and Geophysics
  - 5 Biology
  - 6 Social and Behavioral
  - 7 Astronomy and Celestial Navigation
18. Nuclear Codes
- 0 Unclassified
19. Financial
- 0 Unclassified
  - 1 Investing and Borrowing
  - 2 Capital Stock
  - 3 Taxes
  - 4 Cash Custody and Forecasting
  - 5 General Accounting
  - 6 Auditing
  - 7 Banking Operations

- 20. Cost Accounting
  - 0 Unclassified
  - 1 Material Only
  - 2 Labor Only
  - 3 Work in Progress
- 21. Payroll and Benefits
  - 0 Unclassified
  - 1 Payroll
  - 2 Employee Benefits
  - 3 Profit Sharing
  - 4 Retirement
  - 5 Insurance
  - 6 Credit Union
- 22. Personnel
  - 0 Unclassified
  - 1 Recruiting and Hiring
  - 2 Inventorying Employees
  - 3 Training
  - 4 Performance Review
  - 5 Administering Wages and Salary
- 23. Manufacturing
  - 0 Unclassified
  - 1 Scheduling/Loading
  - 2 Job Reporting
  - 3 Bill of Materials Processors
  - 4 Numerical Control
  - 5 Control Systems
- 24. Quality Assurance/Reliability
  - 0 Unclassified
  - 1 Testing
  - 2 Performance Analysis
- 25. Inventory
  - 0 Unclassified
  - 1 Stocking and Issuing
  - 2 Inventory Analysis
  - 3 Equipment and Tool Inventory and Maintenance
- 26. Purchasing
  - 0 Unclassified
  - 1 Preparing Purchase Orders
  - 2 Matching Invoices
  - 3 Accounts Payable
  - 4 Purchase Analysis
- 27. Marketing
  - 0 Unclassified
  - 1 Sales and Billings Forecasting
  - 2 Promotion and Advertising
  - 3 Bid or Request Analysis
  - 4 Distribution or Territory Analysis
- 28. Sales Entered and Billed
  - 0 Unclassified
  - 1 Order Entry and Scheduling
  - 2 Invoicing
  - 3 Accounts Receivable
  - 4 Sales and Billing Analysis
  - 5 Backlog Reporting
- 29. General Business Services
  - 0 Unclassified
  - 1 Records Retention
  - 2 Forms Management
  - 3 Transportation
  - 4 Printing and Reproduction
- 30. Demonstrations
  - 0 Unclassified
  - 1 Display
  - 2 Participation
- 32. Graphics
  - 0 Unclassified
  - 1 Cathode-Ray Tube (CRT)
  - 2 Hard Copy Devices
- 34. Logical and Symbolic
  - 0 Unclassified
  - 1 Formal Logic
  - 2 Symbol Manipulation



40. Arithmetic Routines
- 0 Unclassified
  - 1 Real Numbers
  - 2 Complex Numbers
  - 3 Decimal
  - 4 Floating Point
  - 5 Integer Arithmetic
  - 6 Number Theory
41. Elementary Functions
- 0 Unclassified
  - 1 Trigonometric
  - 2 Hyperbolic
  - 3 Exponential and Logarithmic
  - 4 Roots and Powers
  - 5 Geometry
  - 6 Logical and Rounded
  - 7 Higher Transcendental Functions
42. Polynomials and Special Functions
- 0 Unclassified
  - 1 Evaluation of Polynomials
  - 2 Roots of Polynomials
  - 3 Evaluation of Special Functions
  - 4 Simultaneous Non-Linear Algebraic Equations
  - 5 Simultaneous Transcendental Equations
  - 6 Summation of Series, Convergence Acceleration
  - 7 Algebraic Operations on Polynomials and Power Series
43. Operations on Functions and Solutions of Differential Equations
- 0 Unclassified
  - 1 Numerical Integration
  - 2 Numerical Solutions of Ordinary Differential Equations
  - 3 Numerical Solutions of Partial Differential Equations
  - 4 Numerical Differentiation
  - 5 Integral Equations
  - 6 Integral Transforms and Their Discrete Analogues
44. Interpolation and Approximations
- 0 Unclassified
  - 1 Table Look-Up and Interpolation
  - 2 Curve Fitting
  - 3 Smoothing
  - 4 Extrema of Functions
  - 5 Summation of Series/Convergence Acceleration
45. Operations on Matrices, Vectors, and Simultaneous Linear Equations
- 0 Unclassified
  - 1 Matrix Operations
  - 2 Eigenvalues and Eigenvectors
  - 3 Determinants
  - 4 Simultaneous Linear Equations
  - 5 Vector Analysis
50. Insurance
- 0 Unclassified
  - 1 Life
  - 2 Fire and Casualty
  - 3 Pension and Welfare
70. Communications and Networking
- 0 Unclassified
99. Unclassified
- 0 Miscellaneous

## Organization of the Catalog

The Catalog is divided into three parts:

- Table of Contents;
- KWIC Index of Program Titles;
- Abstracts of Available Programs.

The Table of Contents and the Abstracts are listed in program number order. The KWIC Index of Program Titles gives the program number as the reference point.

All currently available programs have the prefix 360D, 360E, 370D, or 1130. Pre-3000, 3000, and 7000 series programs are not available through SPLA. It is possible to obtain some of these programs from the following address:

Mr. Robert Bell  
Campus Computing Network (C0012)  
UCLA  
Los Angeles, CA 90024

TABLE OF CONTENTS

PROGRAM NUMBER	PROGRAM TITLE	PAGE
370D-00.0.024	COMPRESSED SOURCE LIBRARY SYSTEM	9
360E-00.1.016	IBM S/360 MODEL 20 MULTIUTILITY PROGRAM	9
360D-00.2.001	BPS/DOS/TOS FORTRAN FLOWCHART PROGRAM	10
360D-00.4.014	CHANGE1 - OS/360 DASD EXPIRATION DATE WRITER	10
360D-00.4.019	SUSAN, DISK MAPPING PROGRAM	10
370D-00.4.020	DASD ALTERNATE TRACK ANALYSIS (ALTRACK)	11
370D-00.4.021	DASD SEEK MAPPING AID (SEEKER)	11
360D-00.5.007	DIRECT ACCESS VOLUME COPY PROGRAM	12
360D-00.5.008	TSO DATASET MIGRATION AND MAINTENANCE PACKAGE, FATSO	12
360D-00.5.009	VARIABLE LENGTH RECCRD DELETION SUBROUTINE, VBDMDLET	13
360D-00.6.008	I02260 DISPLAY/ATTENTION PACKAGE	13
360D-00.6.011	A HYPertext EDITING SYSTEM FOR THE S/360 USING THE 2250 DISPLAY	13
360D-01.0.010	ONE-WAY ENCIPHERING ALGORITHM FOR PASSWORD PROTECTION	14
360D-01.4.003	OPERATING SYSTEM ACCOUNTING	14
360D-01.4.009	SUPER-SCRATCH (SUPERSCR)	15
360D-01.4.012	CHGPASS CMMAND PROCESSOR	15
360D-01.6.005	VTOC4MAT	15
360D-01.6.008	PROCESS MEMBERS OF PARTIONED DATA SETS WITH PL/I	16
360D-03.0.010	STENO TO ENGLISH TRANSLATION	16
360D-03.0.014	MULTIPROGRAMMING SYSTEM (MPS)	16
360D-03.0.015	GEMS - A GRAPHICAL EXPERIMENTAL META SYSTEM	17
360D-03.1.014	FAST-ASSEMBLER-INTERPRETER FOR S/360 AND S/370 ASSEMBLER LANGUAGE (VERSION 4), SPASM	17
360D-03.2.008	KINETIC SIMULATION LANGUAGE FOR CHEMISTRY AND BIOCHEMISTRY	18
360D-03.2.014	THE SIMSCRIPT II PROGRAMMING LANGUAGE	18
360D-03.2.015	THE XPL COMPILER GENERATOR SYSTEM	19
360D-03.2.016	*1 (STAR-1) - LIST PROCESSING LANGUAGE	19
360D-03.2.017	PAPER SAVING MODIFICATIONS TO FORTRAN H AND G WITH NOSOURCE OPTION	20
360D-03.3.010	SNAP PROCESSOR (PROTOTYPE)	20
360D-03.3.011	COMIT/360	20
360D-03.3.013	SHARE FORMAC/FORMAC73	21
370D-03.3.014	APL/SV (OS/MVT VERSION) MODIFICATIONS	21
370D-03.3.015	APL/SV ASCII MODIFICATIONS	22
360D-03.3.016	PILOT	22
360D-03.4.027	FORTTRAN RANDOM I/O SUBROUTINE	22
360D-03.4.033	A 2250 MODEL 1 SIMULATION SUPPORT PACKAGE	23
360D-03.5.005	A SYSTEM TO PROCESS ABSTRACT CATALOGS AND RELATED INDICES REPORT WRITER	23
360D-03.5.007	NSCRIPT - PRODUCES TEXT DATASETS IN MANUSCRIPT FORM	24
360D-03.5.008	PL/I REPORT WRITER MACROS	24
360D-03.5.009	PL/I REPORT WRITER MACROS	25
360D-03.6.001	FORTTRAN CROSS REFERENCE	25
360D-03.6.007	COBOL SOURCE CROSS-REFERENCE LISTING	26
360D-03.6.018	NEATER: A PL/I SOURCE STATEMENT REFORMATTER	26
360D-03.6.019	SIMPLE: A SIMPLE PRECEDENCE TRANSLATOR WRITING SYSTEM	27
360D-03.6.020	MORTTRAN, A FORTRAN LANGUAGE EXTENSION	27
360D-03.6.022	DECTALB, A DECISION TABLE TRANSLATOR BASED ON LIST	27

TABLE OF CONTENTS

PROGRAM NUMBER	PROGRAM TITLE	PAGE
	PROCESSING TECHNIQUES	27
360D-03.6.023	COBOL MODULE AND GO TO CHECKER	28
360D-03.6.024	COBOL MODULE INDEXER AND LOOP CHECKER	28
360D-03.6.025	MAP/II MACRO PRE-PROCESSOR	29
360D-03.6.026	MORTRAN2, A PORTABLE MACRO-BASED STRUCTURED FORTRAN EXTENSION	29
360D-03.6.027	TIME SHARING LANGUAGE/ONE (TL/1)	30
360D-03.7.034	MACRO CROSS-REFERENCE PROGRAM	30
360D-03.8.013	PL/I STRING FUNCTICNS	30
360D-03.8.016	COBFORT - AN INTERFACE ENABLING STANDARD CALLS TO FORTRAN PROGRAMS, SUBPROGRAMS, AND LIBRARY SUBPROGRAMS FROM OTHER LANGUAGES.	31
360D-04.0.006	CLOCK	31
360D-04.0.010	SIMPLIFIED INPUT - OUTPUT AND DEBUGGING MACROS FOR ASSEMBLER LANGUAGE USERS	32
360D-04.0.011	MACROS FOR SIMPLIFIED I/O AND DIAGNOSTIC PRINTOUTS	32
360D-04.1.012	FORTRAN H SYMBOLIC DEBUGGING PACKAGE	32
360D-04.2.008	PL/I EXECUTION ANALYZER (PLEA)	33
360D-04.2.009	DUMBBELL OR DEBUGGER	33
360D-04.4.012	TSO ANALYSIS - SYSTEM MEASUREMENT - TIME-SHARING PERFORMANCE - SIMULATION	34
370D-05.0.004	HASP V4.0 RETROFIT TO MFT-II	34
360D-05.1.018	BAYLOR EXECUTIVE SYSTEM FOR TELEPROCESSING (BEST)	34
360D-05.1.021	REMOTE HASP TO HASP	35
370D-05.1.022	VS1 HASP	35
360D-05.1.023	TEXAS INTERACTIVE PROGRAMMING SYSTEM (TIPS)	36
360D-05.1.024	ASP TO HASP LINK	37
360D-05.2.014	NETUCC 1.1, TSO ENHANCEMENT PACKAGE	37
360D-05.2.015	INTER-SYSTEM SHARED ENQUE	38
360D-05.2.016	DDSS - DYNAMIC DATA SET SECURITY SHARED DASD ENQUE	38
360D-05.5.002	SIAC MODIFICATIONS TO OS/VIS LOADER	38
360D-06.0.007	FORMAT, A TEXT-PROCESSING PROGRAM	39
360D-06.0.008	PRINT - A TEXT FORMATTING PROGRAM	39
360D-06.0.009	COMPARE DATA SET UTILITY	40
360D-06.1.006	SIMPLIFIED INTERFACE FOR INVOKING SORT FROM PL/I OPTIMIZER PROGRAMS (A#SORT)	40
360D-06.3.012	A HIGH SPEED BISYNCHRONOUS COMMUNICATIONS ACCESS METHOD	41
1130-06.3.017	ENHANCED HASP RTP1130 WORKSTATION FOR DISK I/O	41
360D-06.5.006	UNIVAC-1108 TO IBM-360 FLOATING POINT INTERNAL CONVERTER ('CVFLO8')	41
360D-06.6.003	FORTRAN CHARACTER STRING PACKAGE	42
360D-06.6.004	CHARACTER FILTER PL/I	42
360D-06.7.018	BSEARCH - A RANDOM ACCESS BINARY-SEARCH TECHNIQUE FOR SEQUENTIAL FILES ON DISK OR DRUM	42
360D-06.7.019	KWADE - KEYWORD AS A DICTIONARY ENTRY	43
360D-06.7.022	OS/360 QUIC (KWIC INDEXING)	43
360D-06.7.026	THE NRIMS ADDRESSING SYSTEM	44
360D-06.7.027	BAYLOR INFORMATION ANALYSIS SYSTEM (BIAS)	44
360D-06.7.028	SELECT PROGRAM	45

TABLE OF CONTENTS

PROGRAM NUMBER	PROGRAM TITLE	PAGE
360D-06.8.002	LPI	46
360D-06.8.003	THE DATA STRUCTURES PROGRAMMING SYSTEM	46
360D-06.8.004	IN-CORE STACK MANIPULATICN FOR OS/360 ASSEMBLER LANGUAGE PROGRAMS	47
360D-08.0.003	WRIMAT MATRIX WRITER	47
360D-08.6.001	PLOTS - A SUBROUTINE FOR TIME-SERIES PLOTTING ON A PRINTER	48
360D-08.6.002	INTERFACE BETWEEN PL/I USER PROGRAMS AND CALCOMP ROUTINES	48
360D-08.6.003	PLOT - A SUBROUTINE FOR PLOTTING ON A PRINTER	49
360D-08.6.011	PNRG, PERSPECTIVE PLOTTING ROUTINE, ARBITRARY GRID	49
360D-08.6.012	PRG, PERSPECTIVE PLOTTING ROUTINE, RECTANGULAR GRID	49
360D-08.6.013	PLT360, IBM 1627 PLOTTING ROUTINE	50
360D-08.7.003	HISTOGRAM DISPLAY SUBROUTINE	50
360D-08.7.004	INTERSECTION DETECTION IN THREE DIMENSIONS - A TOOL FOR COMPUTER AIDED ENGINEERING DESIGN AND GRAPHIC DISPLAY	51
360D-08.7.006	SPLOT - ONE PAGE GRAPH-PRINTING SUBROUTINE	51
360D-11.3.015	COMMERCIAL FEATURE EMULATOR FOR SYSTEM/360 MODEL 44	52
360D-11.4.002	DCALC	52
360D-12.0.003	SIFT BCD CODES TO EBC AND DIAGNOSE FORTRAN IV CONVERSION PROBLEMS UNDER OS/360	52
360D-12.1.024	INTERACTIVE HEX DECIMAL OCTAI CALCULATOR	53
360D-12.2.002	FORTRAN IV TO PL/I TRANSLATOR	53
360D-12.2.010	CDC TO IBM FORTRAN CONVERSION	54
360D-13.2.003	NLIN: LEAST-SQUARES ESTIMATICN OF NON-LINEAR PARAMETERS	54
360D-13.4.001	COOLEY-TUKEY FAST FOURIER TRANSFORM	54
360D-13.4.002	COOLEY-TUKEY FAST FOURIER TRANSFORM	55
360D-13.6.003	NONLINEAR PARAMETER ESTIMATICN AND PROGRAMMING	55
360D-13.6.007	NONLINEAR LEAST-SQUARES CURVE FITTING PROGRAM	56
360D-13.6.008	LINEAR LEAST-SQUARES CURVE FITTING PROGRAM	57
360D-13.7.001	DIALL - GENERAL LEAST SQUARES DIALLEL ANALYSIS OF VARIANCE	58
360D-15.0.005	TRANSIENT SOLUTIONS FOR MARKOV CHAINS	58
360D-15.1.004	360 GASP III - GENERALIZED ACADEMIC SIMULATION PROGRAM	58
360D-15.1.008	SOL-370 SIMULATION SYSTEM	59
360D-15.2.007	MFOR 360 LINEAR PROGRAMMING CODE	59
360D-15.2.011	ZERO-ONE INTEGER PROGRAMMING WITH HEURISTICS	60
360D-15.2.014	AN ADJACENT EFFICIENT EXTREME POINT ALGORITHM FOR VECTOR- MAXIMUM AND INTERVAL WEIGHTED-SUMS LINEAR PROGRAMMING PROBLEMS	60
360D-15.3.003	A COMPLEMENTARY PIVOT METHOD FOR SOLVING QUADRATIC PROGRAMMING PROBLEMS	61
360D-15.6.003	COMPUTERIZED RELATIVE ALLOCATION OF FACILITIES TECHNIQUE, CRAFT 4.2	61
360D-15.6.004	CRAFT-M - COMPUTERIZED ALLOCATION OF FACILITIES TECHNIQUE (INCLUDING DEPT. MOVE COSTS)	62
360D-16.0.001	UCARDS: UNION CARBIDE AUTOMATIC ROUTINE AND DESIGN FOR PRINTED CIRCUIT BOARDS	62
360D-16.0.002	PROGRAMS FOR CALCULATION OF MICROWAVE INTERFERENCE	62
360D-16.0.003	FAA INTEGRATED NOISE MODEL PROGRAM PACKAGE (VERSION 2)	63
360D-16.1.001	ROCKET - FORTRAN 4 VERSION	63

TABLE OF CONTENTS

PROGRAM NUMBER	PROGRAM TITLE	PAGE
360D-16.3.002	PULSE TESTING VIA THE FAST FOURIER TRANSFORM	64
360D-17.1.001	QUANTITATIVE ANALYSIS WITH ELECTRON MICROPROBE ANALYZER	64
360D-17.2.006	CERN SUMX - A DATA SUMMARIZATION PROGRAM FOR THE IBM/360	64
360D-17.4.003	TRANSIENT ONE-DIMENSIONAL AND SIMULTANEOUS SOLUTE AND WATER FLOW IN SOILS	65
360D-17.4.004	CAMIVA - CARTOGRAPHIC AUTOMATIC MAPPING SYSTEM	65
360D-23.0.001	COFAD: COMPUTERIZED FACILITIES DESIGN	66
360D-23.0.002	CORELAP: COMPUTERIZED RELATIONSHIP LAYOUT PLANNING	66
360D-23.0.003	PLANET: PLANT LAYOUT ANALYSIS AND EVALUATION TECHNIQUE	66
360D-23.0.004	ALDEP: AUTOMATED LAYOUT DESIGN PROGRAM	67
360D-23.1.003	TWO-STAGE, TWO-DIMENSIONAL TRIM PROGRAM II	67
360D-23.4.004	360 APT - V4M3/SSX3A/SSIF	68
370D-23.4.005	370 APT-AC (PTF3), APTLFT IMPLEMENTATION	68
360D-40.0.001	DFACT - DOUBLE PRECISION FACTORIAL	68
360D-40.0.003	INTFORT - INTERVAL ARITHMETIC INTERPRETER AND SUBROUTINE PACKAGE	69
360D-40.4.003	MULTIPLE - PRECISION FLOATING-POINT ARITHMETIC PACKAGE	69
360D-40.4.004	A MULTIPLE PRECISION PACKAGE FOR THE IBM OS 360/370 SYSTEMS	69
360D-42.2.001	EXPERIMENTAL PROGRAM FOR DETERMINING POLYNOMIAL ZEROS	70
360D-43.2.001	MIDAS - AN ADAPTATION OF THE CONVAIR PRE-COMPILING MIDAS-III DIGITAL ANALOG SIMULATION SYSTEM TO OS/360 WITH CALCOMP PLOTTING	70
360D-45.0.001	PL/I SUBPROCEDURE COLLECTION - RELEASE 1	71
360D-99.0.002	NARGS - NUMBER OF ARGUMENTS	71
360D-99.0.009	PROGRAM COLLECTION: STRUCTURED PROGRAMMING, UTILITIES, TRANSLATORS, SIMULATOR, HASP MODIFICATIONS, AND MACROS	71
	END OF TABLE OF CONTENTS	

## KWIC (KEYWORD-IN-CONTEXT) INDEX

PAGE 1

TITLE	PROGRAM NO.	TITLE	PROGRAM NO.
NT INTERNAL CONVERTER ( 'CVFLO8')	360D-06.5.006	BAYLOR EXECUTIVE SYSTEM	360D-05.1.018
A SYSTEM TO PROCESS	360D-03.5.005	BAYLOR INFORMATION ANAL	360D-06.7.027
370 APT-	370D-23.4.005	BCD CODES TO EBC AND DI	360D-12.0.003
GASP III - GENERALIZED	360D-15.1.004	SIFT	
BSEARCH - A RANDOM	360D-06.7.018	EM FOR TELEPROCESSING (	
RONOUS COMMUNICATIONS	360D-06.3.012	INTERFACE	
DIRECT	360D-00.5.007	ATION ANALYSIS SYSTEM (	
OPERATING SYSTEM	360D-01.4.003	ARCH - A RANDOM ACCESS	
MIDAS - AN	360D-43.2.001	UAGE FOR CHEMISTRY AND	
THE NRIMS	360D-06.7.026	A HIGH SPEED	
AN	360D-15.2.014	GN FOR PRINTED CIRCUIT	
DASD SEEK MAPPING	370D-00.4.021		
- A TOOL FOR COMPUTER	360D-08.7.004	PILOT	
	360D-23.0.004	SYSTEM TO OS/360 WITH	
ONE-WAY ENCIPHERING	360D-01.0.010	PL/I USER PROGRAMS AND	
FFICIENT EXTREME POINT	360D-15.2.014	PROGRAMS FOR	
CRAFT-M - COMPUTERIZED	360D-15.6.004	TIVE HEX DECIMAL OCTAL	
COMPUTERIZED RELATIVE	360D-15.6.003	FACE ENABLING STANDARD	
DASD	370D-00.4.020		
ERNATE TRACK ANALYSIS (	370D-00.4.020	UCARDS: UNION	
LING MIDAS-III DIGITAL	360D-43.2.001	CAMIVA -	
DASD ALTERNATE TRACK	370D-00.4.020	EM TO PROCESS ABSTRACT	
TSO	360D-04.4.012		
PLANET: PLANT LAYOUT	360D-23.0.003	T SOLUTIONS FOR MARKOV	
LEAST SQUARES DIALLEL	360D-13.7.001		
BAYLOR INFORMATION	360D-06.7.027		
QUANTITATIVE	360D-17.1.001		
TH ELECTRON MICROSCOPE	360D-17.1.001		
PL/I EXECUTION	360D-04.2.008	FORTRAN	
	370D-03.3.014	ODULE INDEXER AND LOOP	
	370D-03.3.015	COBOL MODULE AND GO TO	
360	360D-23.4.004	IMULATION LANGUAGE FOR	
370	370D-23.4.005	AND DESIGN FOR PRINTED	
370 APT-AC (PTF3),	370D-23.4.005		
TIVE PLOTTING ROUTINE;	360D-08.6.011		
NARGS - NUMBER OF	360D-99.0.002		
INTPORT - INTERVAL	360D-40.0.003		
ECISION FLOATING-POINT	360D-40.4.003		
APL/SV	370D-03.3.015	360 LINEAR PROGRAMMING	
	360D-05.1.024	SIFT BCD	
ANIPULATION FOR OS/360	360D-06.8.004		
ER FOR S/360 AND S/370	360D-03.1.014	PL/I SUBPROCEDURE	
D DEBUGGING MACROS FOR	360D-04.0.010	PROGRAM	
FAST	360D-03.1.014		
IO2260 DISPLAY/	360D-00.6.008	CHGPASS	
ALDEP:	360D-23.0.004		
CAMIVA - CARTOGRAPHIC	360D-17.4.004	GH SPEED BISYNCHRONOUS	
UCARDS: UNION CARBIDE	360D-16.0.001		
ISION TABLE TRANSLATOR	360D-03.6.022	THE XPL	
RAN2, A PORTABLE MACRO-	360D-03.6.026	ION OF THE CONVAIR PRE-	

## KWIC (KEYWORD-IN-CONTEXT) INDEX

PAGE 2

TITLE	PROGRAM NO.	TITLE	PROGRAM NO.
A	360D-15.3.003	INTERSECTION	360D-08.7.004
IMENSIONS - A TOOL FOR	370D-00.0.024	PERIMENTAL PROGRAM FOR	360D-42.2.001
CRAFT-M -	360D-08.7.004	T BCD CODES TO EBC AND	360D-40.0.001
COFAD:	360D-15.6.004	FOR SIMPLIFIED I/O AND	360D-12.0.003
CORELAP:	360D-23.0.001	GENERAL LEAST SQUARES	360D-04.0.011
- AN ADAPTATION OF THE	360D-23.0.002	KWADE - KEYWORD AS A	360D-13.7.001
CDC TO IBM FORTRAN	360D-15.6.003	RE-COMPILING MIDAS-III	360D-13.7.001
ND DIAGNOSE FORTRAN IV	360D-43.2.001	TRANSIENT ONE-	360D-06.7.019
LOADING POINT INTERNAL	360D-12.2.010	TWO-STAGE, TWO-	360D-43.2.001
	360D-12.0.003	ION DETECTION IN THREE	360D-17.4.003
	360D-06.5.006	TP1130 WORKSTATION FOR	360D-23.1.003
DIRECT ACCESS VOLUME	360D-13.4.001	SUSAN,	360D-08.7.004
IN-	360D-13.4.002	OR SEQUENTIAL FILES ON	360D-00.5.007
(INCLUDING DEPT. MOVE	360D-00.5.007	ING DESIGN AND GRAPHIC	1130-06.3.017
FACILITIES TECHNIQUE,	360D-06.8.004	E S/360 USING THE 2250	360D-00.4.019
	360D-23.0.002	HISTOGRAM	360D-06.7.018
	360D-15.6.004	IO2260	360D-08.7.003
FORTRAN	360D-15.6.003	BPS/	360D-00.6.008
COBOL SOURCE	360D-15.6.004	DFACT -	360D-00.2.001
MACRO	360D-03.6.001	NTIAL FILES ON DISK OR	360D-40.0.001
LINEAR LEAST-SQUARES	360D-03.7.034	DDSS -	360D-06.7.018
N-LINEAR LEAST-SQUARES	360D-13.6.008	SIFT BCD CODES TO	360D-04.2.009
TA SET SECURITY SHARED	360D-13.6.007	A HYPertext	360D-05.2.016
CHANGE1 - OS/360	370D-00.4.020	AN ADJACENT	360D-12.0.003
	360D-05.2.016	TITATIVE ANALYSIS WITH	360D-00.6.011
DDSS - DYNAMIC	360D-00.4.014	COMMERCIAL FEATURE	360D-15.2.014
COMPARE	370D-00.4.021	COBFORT - AN INTERFACE	360D-17.1.001
S MEMBERS OF PARTITIONED	360D-05.2.016	ONE-WAY	360D-11.3.015
THE	360D-06.0.009	POOL FOR COMPUTER AIDED	360D-03.8.016
CERN SUMX - A	360D-01.6.008	STENO TO	360D-01.0.010
TSO	360D-06.8.003	NETUCC 1.1 - TSO	360D-08.7.004
SCRIPT - PRODUCES TEXT	360D-17.2.006	INTER-SYSTEM SHARED	360D-03.0.010
OS/360 DASD EXPIRATION	360D-00.5.008	T SECURITY SHARED DASD	360D-05.2.014
	360D-03.5.008	KEYWORD AS A DICTIONARY	360D-05.2.016
	360D-00.4.014	NONLINEAR PARAMETER	360D-06.7.019
	360D-00.4.014	NLIN: LEAST-SQUARES	360D-13.6.003
	360D-11.4.002	NT LAYOUT ANALYSIS AND	360D-13.2.003
	360D-05.2.016	PL/I	360D-23.0.003
DUMBBELL OR	360D-04.2.009	BAYLOR	360D-04.2.008
IED INPUT - OUTPUT AND	360D-04.0.010	GEMS - A GRAPHICAL	360D-05.1.018
FORTRAN H SYMBOLIC	360D-04.1.012	CHANGE1 - OS/360 DASD	360D-03.0.015
INTERACTIVE HEX	360D-12.1.024	AN, A FORTRAN LANGUAGE	360D-42.2.001
DECTALB, A	360D-03.6.022	SED STRUCTURED FORTRAN	360D-00.4.014
VARIABLE LENGTH RECORD	360D-03.6.022	AN ADJACENT EFFICIENT	360D-03.6.020
S TECHNIQUE (INCLUDING	360D-00.5.009		360D-03.6.026
OMPUTERIZED FACILITIES	360D-15.6.004		360D-15.2.014
UTER AIDED ENGINEERING	360D-23.0.001		
AUTOMATIC ROUTINE AND	360D-08.7.004		
LDEP: AUTOMATED LAYOUT	360D-16.0.001		
	360D-23.0.004		



## KWIC (KEYWORD-IN-CONTEXT) INDEX

PAGE 3

TITLE	PROGRAM NO.	TITLE	PROGRAM NO.		
COFAD: COMPUTERIZED UTERIZED ALLOCATION OF RELATIVE ALLOCATION OF ACT - DOUBLE PRECISION	FAA INTEGRATED NOISE MO FACILITIES DESIGN FACILITIES TECHNIQUE (I FACILITIES TECHNIQUE, C FACTORIAL FAST ASSEMBLER-INTERPRE FAST FOURIER TRANSFORM FAST FOURIER TRANSFORM FAST FOURIER TRANSFORM FATSO FEATURE EMULATOR FOR SY FILES ON DISK OR DRUM FILTER PL/I FITTING PROGRAM FITTING PROGRAM FLOATING POINT INTERNAL FLOATING-POINT ARITHMET FLOW IN SOILS FLOWCHART PROGRAM FORM FORMAC/FORMAC/73 FORMAC/73 FORMAT, A TEXT-PROCESSI FORMATTING PROGRAM FORTRAN CHARACTER STRIN FORTRAN CONVERSION FORTRAN CROSS REFERENCE FORTRAN EXTENSION FORTRAN FLOWCHART PROGR FORTRAN H AND G WITH NO FORTRAN H SYMBOLIC DEBU FORTRAN IV CONVERSION P FORTRAN IV TO PL/I TRAN FORTRAN LANGUAGE EXTENS FORTRAN PROGRAMS, SUBPR FORTRAN RANDOM I/O SUBR FORTRAN 4 VERSION FOURIER TRANSFORM FOURIER TRANSFORM FOURIER TRANSFORM FROM OTHER LANGUAGES. FROM PL/I OPTIMIZER PRO FUNCTIONS G WITH NOSOURCE OPTION GASP III - GENERALIZED GEMS - A GRAPHICAL EXPE GENERAL LEAST SQUARES D GENERALIZED ACADEMIC SI GENERATOR SYSTEM GO TO CHECKER	360D-16.0.003 360D-23.0.001 360D-15.6.004 360D-15.6.003 360D-40.0.001 360D-03.1.014 360D-11.3.001 360D-16.3.002 360D-13.4.002 360D-00.5.008 360D-11.3.015 360D-06.7.018 360D-06.6.004 360D-13.6.008 360D-13.6.007 360D-06.5.006 360D-40.4.003 360D-17.4.003 360D-00.2.001 360D-03.5.008 360D-03.3.013 360D-03.3.013 360D-06.0.007 360D-06.0.008 360D-06.6.003 360D-12.2.010 360D-03.6.001 360D-03.6.026 360D-00.2.001 360D-03.2.017 360D-04.1.012 360D-12.0.003 360D-12.2.002 360D-03.6.020 360D-03.8.016 360D-03.4.027 360D-16.1.001 360D-13.4.001 360D-13.4.002 360D-16.3.002 360D-03.8.016 360D-06.1.006 360D-03.8.013 360D-03.2.017 360D-15.1.004 360D-03.0.015 360D-13.7.001 360D-15.1.004 360D-03.2.015 360D-03.6.023	SPLIT - ONE PAGE ENGINEERING DESIGN AND GEMS - A G ROUTINE; RECTANGULAR ING ROUTINE; ARBITRARY DIFICATIONS TO FORTRAN FORTRAN REMOTE HASP TO VS1 ASP TO RANSLATORS, SIMULATOR, ENHANCED REMOTE TEGER PROGRAMMING WITH INTERACTIVE A A CDC TO PLT360; CISION PACKAGE FOR THE UNIVAC-1108 TO ZATION PROGRAM FOR THE APT-AC (PTF3), APTLFT FACILITIES TECHNIQUE (C COBOL MODULE OS/360 QUIC (KWIC T CATALOGS AND RELATED BAYLOR SIMPLIFIED ZERO-ONE FAA TEXAS COBFORT - AN SIMPLIFIED LCULATION OF MICROWAVE IBM-360 FLOATING POINT - INTERVAL ARITHMETIC FAST ASSEMBLER- INTFORT - OR VECTOR- MAXIMUM AND MPLIFIED INTERFACE FOR	GRAPH-PRINTING SUBROUTI GRAPHIC DISPLAY GRAPHICAL EXPERIMENTAL GRID GRID H AND G WITH NOSOURCE H SYMBOLIC DEBUGGING PA HASP HASP HASP LINK HASP MODIFICATIONS, AND HASP RTP1130 WORKSIATIO HASP TO HASP HASP V4.0 RETROFIT TO M HEURISTICS HEX DECIMAL OCTAL CALCU HIGH SPEED BISYNCHRONOU HISTOGRAM DISPLAY SUBRO HYPERTEXT EDITING SYSTE IBM FORTRAN CONVERSION IBM S/360 MODEL 20 MULT IBM 1627 PLOTTING ROUTI IBM 360/370 SYSTEMS IBM-360 FLOATING POINT IBM/360 IMPLEMENTATION INCLUDING DEPT. MOVE CO INDEXER AND LOOP CHECKE INDEXING) INDICES INFORMATION ANALYSIS SY INPUT - OUTPUT AND DEBU INTEGER PROGRAMMING WIT INTEGRATED NOISE MODEL INTER-SYSTEM SHARED ENQ INTERACTIVE HEX DECIMAL INTERACTIVE PROGRAMMING INTERFACE BETWEEN PL/I INTERFACE ENABLING STAN INTERFACE FOR INVOKING INTERFERENCE INTERNAL CONVERTER ('CV INTERPRETER AND SUBROUT INTERPRETER FOR S/360 A INTERSECTION DETECTION INTERVAL ARITHMETIC INT INTERVAL WEIGHTED-SUMS INTFORT - INTERVAL ARIT INVOKING SORT FROM PL/I IO2260 DISPLAY/ATTENTIO	360D-08.7.006 360D-08.7.004 360D-03.0.015 360D-08.6.012 360D-08.6.011 360D-03.2.017 360D-04.1.012 360D-05.1.021 370D-05.1.022 360D-05.1.024 360D-99.0.009 1130-06.3.017 360D-05.1.021 370D-05.0.004 360D-15.2.011 360D-12.1.024 360D-06.3.012 360D-08.7.003 360D-00.6.011 360D-12.2.010 360E-00.1.016 360D-08.6.013 360D-40.4.004 360D-06.5.006 360D-17.2.006 370D-23.4.005 360D-15.6.004 360D-03.6.024 360D-06.7.022 360D-03.5.005 360D-06.7.027 360D-04.0.010 360D-15.2.011 360D-16.0.003 360D-05.2.015 360D-12.1.024 360D-05.1.023 360D-08.6.002 360D-03.8.016 360D-06.1.006 360D-16.0.002 360D-06.5.006 360D-40.0.003 360D-03.1.014 360D-08.7.004 360D-40.0.003 360D-15.2.014 360D-40.0.003 360D-06.1.006 360D-00.6.008

## KWIC (KEYWORD-IN-CONTEXT) INDEX

PAGE 4

TITLE	PROGRAM NO.	TITLE	PROGRAM NO.
KWADE -	KEYWORD AS A DICTIONARY 360D-06.7.019	CARTOGRAPHIC AUTOMATIC	MAPPING SYSTEM 360D-17.4.004
	KINETIC SIMULATION LANG 360D-03.2.008	RANSIENT SOLUTIONS FOR	MARKOV CHAINS 360D-15.0.005
	KWADE - KEYWORD AS A DI 360D-06.7.019	WRIMAT	MATRIX WRITER 360D-08.0.003
OS/360 QUIC (	KWIC INDEXING) 360D-06.7.022	ALGORITHM FOR VECTOR	MAXIMUM AND INTERVAL WE 360D-15.2.014
MScript II PROGRAMMING	LANGUAGE 360D-03.2.014	TSO ANALYSIS / SYSTEM	MEASUREMENT / TIME-SHAR 360D-04.4.012
R-1) - LIST PROCESSING	LANGUAGE 360D-03.2.016	PROCESS	MEMBERS OF PARTITIONED DA 360D-01.6.008
PILOT CAI	LANGUAGE 360D-03.3.016	GRAPHICAL EXPERIMENTAL	META SYSTEM 360D-03.0.015
N FOR OS/360 ASSEMBLER	LANGUAGE PROGRAMS 360D-06.8.004	COMMUNICATIONS ACCESS	METHOD 360D-06.3.012
60 AND S/370 ASSEMBLER	LANGUAGE (VERSION 4), S 360D-03.1.014	A COMPLEMENTARY PIVOT	METHOD FOR SOLVING QUAD 360D-15.3.003
MORTRAN, A FORTRAN	LANGUAGE EXTENSION 360D-03.6.020		MFOR 360 LINEAR PROGRAM 360D-15.2.007
KINETIC SIMULATION	LANGUAGE FOR CHEMISTRY 360D-03.2.008	HASP V4.0 RETROFIT TO	MFT-II 370D-05.0.004
G MACROS FOR ASSEMBLER	LANGUAGE USERS 360D-04.0.010	ANALYSIS WITH ELECTRON	MICROPROBE ANALYZER 360D-17.1.001
TIME SHARING	LANGUAGE/ONE (TL/1) 360D-03.6.027	AMS FOR CALCULATION OF	MICROWAVE INTERFERENCE 360D-16.0.002
SUBPROGRAMS FROM OTHER	LANGUAGES. 360D-03.8.016		MIDAS - AN ADAPTATION O 360D-43.2.001
PLANET: PLANT	LAYOUT ANALYSIS AND EVA 360D-23.0.003	CONVAIR PRE-COMPILING	MIDAS-III DIGITAL ANALO 360D-43.2.001
ALDEP: AUTOMATED	LAYOUT DESIGN PROBLEM 360D-23.0.004	TSO DATASET	MIGRATION AND MAINTENAN 360D-00.5.008
PUTERIZED RELATIONSHIP	LAYOUT PLANNING 360D-23.0.002	FAA INTEGRATED NOISE	MODEL PROGRAM PACKAGE ( 360D-16.0.003
DIALL - GENERAL	LEAST SQUARES DIALLEL A 360D-13.7.001	A 2250	MODEL 1 SIMULATION SUPP 360D-03.4.033
LINEAR	LEAST-SQUARES CURVE FIT 360D-13.6.008	IBM S/360	MODEL 20 MULTIUTILITY P 360E-00.1.016
NON-LINEAR	LEAST-SQUARES CURVE-FIT 360D-13.6.007	MULATOR FOR SYSTEM/360	MODEL 44 360D-11.3.015
NLIN:	LEAST-SQUARES ESTIMATIO 360D-13.2.003	APL/SV ASCII	MODIFICATIONS 370D-03.3.015
VARIABLE	LENGTH RECORD DELETION 360D-00.5.009	PL/SV (OS/MVT VERSION)	MODIFICATIONS 370D-03.3.014
RAMS, SUBPROGRAMS, AND	LIBRARY SUBPROGRAMS FRO 360D-03.8.016	PAPER SAVING	MODIFICATIONS TO FORTRA 360D-03.2.017
COMPRESSED SOURCE	LIBRARY SYSTEM 370D-00.0.024	SLAC	MODIFICATIONS TO OS/V5 360D-05.5.002
	LINEAR LEAST-SQUARES CU 360D-15.6.008	ATORS, SIMULATOR, HASP	MODIFICATIONS, AND MACR 360D-99.0.009
NON-	LINEAR LEAST-SQUARES CU 360D-13.6.007	COBOL	MODULE AND GO TO CHECKE 360D-03.6.023
ARES ESTIMATION OF NON-	LINEAR PARAMETERS 360D-13.2.003	COBOL	MODULE INDEXER AND LOOP 360D-03.6.024
MFOR 360	LINEAR PROGRAMMING CODE 360D-15.2.007		MORTRAN, A FORTRAN LANG 360D-03.6.020
INTERVAL WEIGHTED-SUMS	LINEAR PROGRAMMING PROB 360D-15.2.014		MORTRAN2, A PORTABLE MA 360D-03.6.026
ASP TO HASP	LINK 360D-05.1.024	NIQUE (INCLUDING DEPT.	MOVE COSTS) 360D-15.6.004
*1 (STAR-1) -	LIST PROCESSING LANGUAG 360D-03.2.016	LTIPROGRAMMING SYSTEM (	MPS) 360D-03.0.014
LE TRANSLATOR BASED ON	LIST PROCESSING TECHNIQ 360D-03.6.022		MULTIPLE - PRECISION FL 360D-40.4.003
SOURCE CROSS-REFERENCE	LISTING 360D-03.6.007	A	MULTIPLE PRECISION PACK 360D-40.4.004
MODIFICATIONS TO OS/V5	LOADER 360D-05.5.002	IBM S/360 MODEL 20	MULTIPROGRAMMING SYSTEM 360D-03.0.014
BOL MODULE INDEXER AND	LOOP CHECKER 360D-03.6.024	APL/SV (OS/	MULTIUTILITY PROGRAM 360E-00.1.016
	LPI 360D-06.8.002		MVT VERSION) MODIFICATI 370D-03.3.014
CRAFT-	M - COMPUTERIZED ALLOCA 360D-15.6.004		NARGS - NUMBER OF ARGUM 360D-99.0.002
	MACRO CROSS-REFERENCE P 360D-03.7.034		NEATER: A PL/I SOURCE 360D-03.6.018
MAP/II	MACRO PRE-PROCESSOR 360D-03.6.025		NETUCC 1.1 - TSO ENHANC 360D-05.2.014
MORTRAN2, A PORTABLE	MACRO-BASED STRUCTURED 360D-03.6.026		NLIN: LEAST-SQUARES EST 360D-13.2.003
PL/I REPORT WRITER	MACROS 360D-03.5.009	FAA INTEGRATED	NOISE MODEL PROGRAM PAC 360D-16.0.003
ASP MODIFICATIONS, AND	MACROS 360D-99.0.009		NON-LINEAR LEAST-SQUARE 360D-13.6.007
- OUTPUT AND DEBUGGING	MACROS FOR ASSEMBLER LA 360D-04.0.010	-SQUARES ESTIMATION OF	NON-LINEAR PARAMETERS 360D-13.2.003
	MACROS FOR SIMPLIFIED I 360D-04.0.011		NONLINEAR PARAMETER EST 360D-13.6.003
DATASET MIGRATION AND	MAINTENANCE PACKAGE, FA 360D-00.5.008	O FORTRAN H AND G WITH	NOSOURCE OPTION 360D-03.2.017
IN-CORE STACK	MANIPULATION FOR OS/360 360D-06.8.004	THE	NRMS ADDRESSING SYSTEM 360D-06.7.026
DUCES TEXT DATASETS IN	MANUSCRIPT FORM 360D-03.5.008		NSCRIPT - PRODUCES TEXT 360D-03.5.008
	MAP/II MACRO PRE-PROCES 360D-03.6.025	NARGS -	NUMBER OF ARGUMENTS 360D-99.0.002
DASD SEEK	MAPPING AID (SEEKER) 370D-00.4.021	INTERACTIVE HEX DECIMAL	OCTAL CALCULATOR 360D-12.1.024
SUSAN, DISK	MAPPING PROGRAM 360D-00.4.019	TIME SHARING LANGUAGE/	ONE (TL/1) 360D-03.6.027

## KWIC (KEYWORD-IN-CONTEXT) INDEX

PAGE 5

TITLE	PROGRAM NO.	TITLE	PROGRAM NO.
ZERO- ONE INTEGER PROGRAMMING	360D-15.2.011	/I EXECUTION ANALYZER ( PLEA)	360D-04.2.008
SPLIT - ONE PAGE GRAPH-PRINTING	360D-08.7.006	PLOT - A SUBROUTINE FOR	360D-08.6.003
TRANSIENT ONE-DIMENSIONAL AND SIM	360D-17.4.003	PLOTS - A SUBROUTINE FO	360D-08.6.001
ONE-WAY ENCIPHERING ALG	360D-01.0.010	PLOTTING	360D-43.2.001
OPERATING SYSTEM ACCOUN	360D-01.4.003	PLOTTING ON A PRINTER	360D-08.6.003
OPTIMIZER PROGRAMS (A#S	360D-06.1.006	PLOTTING ON A PRINTER	360D-08.6.001
OPTION	360D-03.2.017	PLOTTING ROUTINE	360D-08.6.013
OS/MVT VERSION) MODIFIC	370D-03.3.014	PLOTTING ROUTINE; ARBIT	360D-08.6.011
OS/V5 LOADER	360D-05.5.002	PLOTTING ROUTINE; RECTA	360D-08.6.012
OS/360	360D-12.0.003	PLT360; IBM 1627 PLCTTI	360D-08.6.013
OS/360 ASSEMBLER LANGUA	360D-06.8.004	PNRG; PERSPECTIVE PLOTT	360D-08.6.011
OS/360 DASD EXPIRATION	360D-00.4.014	POINT ALGORITHM FOR VEC	360D-15.2.014
OS/360 QUIC (KWIC INDEX	360D-06.7.022	POINT ARITHMETIC PACKAG	360D-40.4.003
OS/360 WITH CALCOMP PLO	360D-43.2.001	POINT INTERNAL CONVERTE	360D-06.5.006
OTHER LANGUAGES.	360D-03.8.016	POLYNOMIAL ZEROS	360D-42.2.001
OUTPUT AND DEBUGGING MA	360D-04.0.010	PORTABLE MACRO-BASED ST	360D-03.6.026
PACKAGE	360D-00.6.008	PRE-COMPILING MIDAS-III	360D-43.2.001
PACKAGE	360D-05.2.014	PRE-PROCESSOR	360D-03.6.025
PACKAGE	360D-03.4.033	PRECEDENCE TRANSLATOR W	360D-03.6.019
PACKAGE	360D-06.6.003	PRECISION FACTORIAL	360D-40.0.001
PACKAGE	360D-04.1.012	PRECISION FLOATING-POIN	360D-40.4.003
PACKAGE	360D-40.0.003	PRECISION PACKAGE FOR T	360D-40.4.004
PACKAGE	360D-40.4.003	PRG; PERSPECTIVE PLOTTI	360D-08.6.012
PACKAGE (VERSION 2)	360D-16.0.003	PRINT - A TEXT FORMATTI	360D-06.0.008
PACKAGE FOR THE IBM 360	360D-40.4.004	PRINTED CIRCUIT BOARDS	360D-16.0.001
PACKAGE, FATSO	360D-00.5.008	PRINTER	360D-08.6.003
PAGE GRAPH-PRINTING SUB	360D-08.7.006	PRINTER	360D-08.6.001
PAPER SAVING MODIFICATI	360D-03.2.017	PRINTING SUBROUTINE	360D-08.7.006
PARAMETER ESTIMATION AN	360D-13.6.003	PRINTOUTS	360D-04.0.011
PARAMETERS	360D-13.2.003	PROBLEM	360D-23.0.004
PARTIONED DATA SETS WIT	360D-01.6.008	PROBLEMS	360D-15.2.014
PASSWORD PROTECTION	360D-01.0.010	PROBLEMS	360D-15.3.003
PERFORMANCE / SIMULATIO	360D-04.4.012	PROBLEMS UNDER OS/360	360D-12.0.003
PERSPECTIVE PLOTTING RO	360D-08.6.011	PROCESS ABSTRACT CATALO	360D-03.5.005
PERSPECTIVE PLOTTING RO	360D-08.6.012	PROCESS MEMBERS OF PART	360D-01.6.008
PILOT CAI LANGUAGE	360D-03.3.016	PROCESSING LANGUAGE	360D-03.2.016
PIVOT METHOD FOR SOLVIN	360D-15.3.003	PROCESSING PROGRAM	360D-06.0.007
PL/I	360D-06.6.004	PROCESSING TECHNIQUES	360D-03.6.022
PL/I	360D-01.6.008	PROCESSOR	360D-03.6.025
PL/I EXECUTION ANALYZER	360D-04.2.008	PROCESSOR	360D-01.4.012
PL/I OPTIMIZER PROGRAMS	360D-06.1.006	PROCESSOR (PROTOTYPE)	360D-03.3.010
PL/I REPORT WRITER MACR	360D-03.5.009	PRODUCES TEXT DATASETS	360D-03.5.008
PL/I SOURCE STATEMENT R	360D-03.6.018	PROGRAM	360D-06.0.007
PL/I STRING FUNCTIONS	360D-03.8.013	PROGRAM	360D-06.7.028
PL/I SUBPROCEDURE COLLE	360D-45.0.001	PROGRAM	360D-03.7.034
PL/I TRANSLATOR	360D-12.2.002	PROGRAM	360D-00.4.019
PL/I USER PROGRAMS AND	360D-08.6.002	PROGRAM	360D-06.0.008
PLANET: PLANT LAYOUT AN	360D-23.0.003	PROGRAM	360D-00.5.007
PLANNING	360D-23.0.002	PROGRAM	360D-00.2.001
PLANT LAYOUT ANALYSIS A	360D-23.0.003	PROGRAM	360E-00.1.016
		ROUTINE AND DESIGN FOR	
		TINE FOR PLOTTING ON A	
		E-SERIES PLOTTING ON A	
		SPLIT - ONE PAGE GRAPH-	
		IED I/O AND DIAGNOSTIC	
		UTOMATED LAYOUT DESIGN	
		UMS LINEAR PROGRAMMING	
		QUADRATIC PROGRAMMING	
		FORTRAN IV CONVERSION	
		A SYSTEM TO	
		*1 (STAR-1) - LIST	
		FORMAT, A TEXT-	
		ANSLATOR BASED ON LIST	
		MAP/II MACRO PRE-	
		CHGPASS COMMAND	
		SNAP	
		NSCRIPT -	
		MAT, A TEXT-PROCESSING	
		SELECT	
		MACRO CROSS-REFERENCE	
		SUSAN, DISK MAPPING	
		NT - A TEXT FORMATTING	
		PROGRAM	
		ECT ACCESS VOLUME COPY	
		PROGRAM	
		/TOS FORTRAN FLOWCHART	
		PROGRAM	
		MODEL 20 MULTIUTILITY	
		PROGRAM	

## KWIC (KEYWORD-IN-CONTEXT) INDEX

PAGE 6

TITLE	PROGRAM NO.	TITLE	PROGRAM NO.
ED ACADEMIC SIMULATION	PROGRAM 360D-15.1.004	R PROGRAMS AND CALCOMP	ROUTINES 360D-08.6.002
-SQUARES CURVE FITTING	PROGRAM 360D-13.6.008	ENHANCED HASP	RTP1130 WORKSTATION FOR 1130-06.3.017
-SQUARES CURVE-FITTING	PROGRAM 360D-13.6.007	EMBLER-INTERPRETER FOR	S/360 AND S/370 ASSEMBL 360D-03.1.014
	PROGRAM COLLECTION: STR 360D-99.0.009	IBM	S/360 MODEL 20 MULTIUTI 360E-00.1.016
EXPERIMENTAL	PROGRAM FOR DETERMINING 360D-42.2.001	EDITING SYSTEM FOR THE	S/360 USING THE 2250 DI 360D-00.6.011
- A DATA SUMMARIZATION	PROGRAM FOR THE IBM/360 360D-17.2.006	ERPRETER FOR S/360 AND	S/370 ASSEMBLER LANGUAG 360D-03.1.014
, TWO-DIMENSIONAL TRIM	PROGRAM II 360D-23.1.003	PAPER	SAVING MODIFICATIONS TO 360D-03.2.017
INTEGRATED NOISE MODEL	PROGRAM PACKAGE (VERSIO 360D-16.0.003	SUPER-	SCRATCH (SUPERSCR) 360D-01.4.009
RAMETER ESTIMATION AND	PROGRAMMING 360D-13.6.003	A RANDOM ACCESS BINARY-	SEARCH TECHNIQUE FOR SE 360D-06.7.018
MFOR 360 LINEAR	PROGRAMMING CODE 360D-15.2.007	DSS - DYNAMIC DATA SET	SECURITY SHARED DASD EN 360D-05.2.016
THE SIMSCRIPT II	PROGRAMMING LANGUAGE 360D-03.2.014	DASD	SEEK MAPPING AID (SEEKE 370D-00.4.021
L WEIGHTED-SUMS LINEAR	PROGRAMMING PROBLEMS 360D-15.2.014	DASD SEEK MAPPING AID (	SEEKER) 370D-00.4.021
FOR SOLVING QUADRATIC	PROGRAMMING PROBLEMS 360D-15.3.003	SELECT PROGRAM	360D-06.7.028
THE DATA STRUCTURES	PROGRAMMING SYSTEM 360D-06.8.003	SEQUENTIAL FILES ON DIS	360D-06.7.018
TEXAS INTERACTIVE	PROGRAMMING SYSTEM (TIP 360D-05.1.023	SERIES PLOTTING ON A PR	360D-08.6.001
ZERO-ONE INTEGER	PROGRAMMING WITH HEURIS 360D-15.2.011	SET SECURITY SHARED DAS	360D-05.2.016
COLLECTION: STRUCTURED	PROGRAMMING, UTILITIES, 360D-99.0.009	SET UTILITY	360D-06.0.009
60 ASSEMBLER LANGUAGE	PROGRAMS 360D-06.8.004	SETS WITH PL/I	360D-01.6.008
RT FROM PL/I OPTIMIZER	PROGRAMS (A#SORT) 360D-06.1.006	SHARE FORMAC/FORMAC/73	360D-03.3.013
FACE BETWEEN PL/I USER	PROGRAMS AND CALCOMP RO 360D-08.6.002	SHARED DASD ENQUE	360D-05.2.016
	PROGRAMS FOR CALCULATIO 360D-16.0.002	SHARED ENQUE	360D-05.2.015
NDARD CALLS TO FORTRAN	PROGRAMS, SUBPROGRAMS, 360D-03.8.016	TIME	SHARING LANGUAGE/ONE (T 360D-03.6.027
ALGORITHM FOR PASSWORD	PROTECTION 360D-01.0.010	TEM MEASUREMENT / TIME-	SHARING PERFORMANCE / S 360D-04.4.012
SNAP PROCESSOR (	PROTOTYPE) 360D-03.3.010		SIFT BCD CODES TO EEC A 360D-12.0.003
370 APT-AC (	PTF3), APTLFT IMPLEMENT 370D-23.4.005	SIMPLE: A	SIMPLE PRECEDENCE TRANS 360D-03.6.019
	PULSE TESTING VIA THE F 360D-16.3.002	MACROS FOR	SIMPLE: A SIMPLE PRECED 360D-03.6.019
VOT METHOD FOR SOLVING	QUADRATIC PROGRAMMING P 360D-15.3.003		SIMPLIFIED I/O AND DIAG 360D-04.0.011
	QUANTITATIVE ANALYSIS W 360D-17.1.001		SIMPLIFIED INPUT - OUTP 360D-04.0.010
OS/360	QUIC (KWIC INDEXING) 360D-06.7.022		SIMPLIFIED INTERFACE FO 360D-06.1.006
BSEARCH - A	RANDOM ACCESS BINARY-SE 360D-06.7.018	THE	SIMSCRIPT II PROGRAMMIN 360D-03.2.014
FORTRAN	RANDOM I/O SUBROUTINE 360D-03.4.027	-SHARING PERFORMANCE /	SIMULATION 360D-04.4.012
VARIABLE LENGTH	RECORD DELETION SUBROUT 360D-00.5.009	KINETIC	SIMULATION LANGUAGE FOR 360D-03.2.008
TIVE PLOTTING ROUTINE;	RECTANGULAR GRID 360D-08.6.012	- GENERALIZED ACADEMIC	SIMULATION PROGRAM 360D-15.1.004
FORTRAN CROSS	REFERENCE 360D-03.6.001	A 2250 MODEL 1	SIMULATION SUPPORT PACK 360D-03.4.033
COBOL SOURCE CROSS-	REFERENCE LISTING 360D-03.6.007	SOL-370	SIMULATION SYSTEM 360D-15.1.008
MACRO CROSS-	REFERENCE PROGRAM 360D-03.7.034	DAS-III DIGITAL ANALOG	SIMULATION SYSTEM TO OS 360D-43.2.001
PL/I SOURCE STATEMENT	REFORMATTER 360D-03.6.018	TILITIES, TRANSLATORS,	SIMULATOR, HASP MODIFIC 360D-99.0.009
ABSTRACT CATALOGS AND	RELATED INDICES 360D-03.5.005	NT ONE-DIMENSIONAL AND	SIMULTANEOUS SOLUTE AND 360D-17.4.003
CORELAP: COMPUTERIZED	RELATIONSHIP LAYOUT PLA 360D-23.0.002		SLAC MODIFICATIONS TO O 360D-05.5.002
COMPUTERIZED	RELATIVE ALLOCATION OF 360D-15.6.003		SNAP PROCESSOR (PRCTOTY 360D-03.3.010
PROCEDURE COLLECTION -	RELEASE 1 360D-45.0.001	LUTE AND WATER FLOW IN	SOILS 360D-17.4.003
	REMOTE HASP TO HASP 360D-05.1.021		SOL-370 SIMULATION SYST 360D-15.1.008
	REPORT WRITER 360D-03.5.007	IONAL AND SIMULTANEOUS	SOLUTE AND WATER FLCW I 360D-17.4.003
PL/I	REPORT WRITER MACROS 360D-03.5.009	TRANSIENT	SOLUTIONS FOR MARKOV CH 360D-15.0.005
HASP V4.0	RETROFIT TO MFT-II 370D-05.0.004	NTARY PIVOT METHOD FOR	SOLVING QUADRATIC PROGR 360D-15.3.003
560; IBM 1627 PLOTTING	ROCKET - FORTRAN 4 VERS 360D-16.1.001	INTERFACE FOR INVOKING	SORT FROM PL/I OPTIMIZE 360D-06.1.006
ION CARBIDE AUTOMATIC	ROUTINE 360D-08.6.013	OPTIMIZER PROGRAMS (A#	SORT) 360D-06.1.006
; PERSPECTIVE PLOTTING	ROUTINE AND DESIGN FOR 360D-16.0.001	COBOL	SOURCE CRCS-REFERENCE 360D-03.6.007
; PERSPECTIVE PLOTTING	ROUTINE; ARBITRARY GRID 360D-08.6.011	COMPRESSED	SOURCE LIBRARY SYSTEM 370D-00.0.024
	ROUTINE; RECTANGULAR GR 360D-08.6.012	NEATER: A PL/I	SOURCE STATEMENT REFORM 360D-03.6.018

## KWIC (KEYWORD-IN-CONTEXT) INDEX

PAGE 7

TITLE	PROGRAM NO.	TITLE	PROGRAM NO.
LANGUAGE (VERSION 4), A HIGH	SPASM 360D-03.1.014	INTERACTIVE PROGRAMMING SYSTEM (TIPS)	360D-05.1.023
LINEAR LEAST- NON-LINEAR LEAST- DIAL - GENERAL LEAST- NLIN: LEAST- 360 APT - V4M3/SSX3A/ 360 APT - V4M3/ IN-CORE	SPEED BISYNCHRONOUS COM 360D-06.3.012 SLOT - ONE PAGE GRAPH- SQUARES CURVE FITTING P 360D-08.7.006 SQUARES CURVE-FITTING P 360D-13.6.008 SQUARES DIALLEL ANALYSI 360D-13.6.007 SQUARES ESTIMATION OF N 360D-13.7.001 SSIP 360D-13.2.003 SSX3A/SSIP 360D-23.4.004 360D-23.4.004 STACK MANIPULATION FOR 360D-06.8.004 STAGE, TWO-DIMENSIONAL 360D-23.1.003 STANDARD CALLS TO PORTR 360D-03.8.016 STAR-1) - LIST PROCESSI 360D-03.2.016 STATEMENT REFORMATTER 360D-03.6.018 STENO TO ENGLISH TRANSL 360D-03.0.010 STRING FUNCTIONS 360D-03.8.013 STRING PACKAGE 360D-06.6.003	OPERATING SYSTEM ACCOUNTING 360D-01.4.003 SYSTEM FOR TELEPROCESSI 360D-05.1.018 SYSTEM FOR THE S/360 US 360D-00.6.011 SYSTEM MEASUREMENT / TI 360D-04.4.012 SYSTEM SHARED ENQUE 360D-05.2.015 SYSTEM TO OS/360 WITH C 360D-43.2.001 SYSTEM TO PROCESS ABSTR 360D-03.5.005 SYSTEM/360 MODEL 44 360D-11.3.015 SYSTEMS 360D-40.4.004 TABLE TRANSLATOR BASED 360D-03.6.022 TECHNIQUE 360D-23.0.003 TECHNIQUE (INCLUDING DE 360D-15.6.004 TECHNIQUE FOR SEQUENTIA 360D-06.7.018 TECHNIQUE, CRAFT 360D-15.6.003 TECHNIQUES 360D-03.6.022 TELEPROCESSING (BEST) 360D-05.1.018 TESTING VIA THE FAST FO 360D-16.3.002 TEXAS INTERACTIVE PROGR 360D-05.1.023 TEXT DATASETS IN MANUSC 360D-03.5.008 TEXT FORMATTING PROGRAM 360D-06.0.008 TEXT-PROCESSING PROGRAM 360D-06.0.007 THREE DIMENSIONS - A TO 360D-08.7.004 TIME SHARING LANGUAGE/O 360D-03.6.027 TIME-SERIES PLOTTING ON 360D-08.6.001 TIME-SHARING PERFORMANC 360D-04.4.012 TIPS) 360D-05.1.023 TL/1) 360D-03.6.027 TOOL FOR COMPUTER AIDED 360D-08.7.004 TOS FORTRAN FLOWCHART P 360D-00.2.001 TRACK ANALYSIS (ALTRAC 370D-00.4.020 TRANSFORM 360D-13.4.001 TRANSFORM 360D-13.4.002 TRANSFORM 360D-16.3.002 TRANSIENT ONE-DIMENSION 360D-17.4.003 TRANSIENT SOLUTIONS FOR 360D-15.0.005 TRANSLATION 360D-03.0.010 TRANSLATCR 360D-12.2.002 TRANSLATOR BASED ON LIS 360D-03.6.022 TRANSLATOR WRITING SYST 360D-03.6.019 TRANSLATCRS, SIMULATOR, 360D-99.0.009 TRIM PROGRAM II 360D-23.1.003 TSO ANALYSIS / SYSTEM M 360D-04.4.012 TSO DATASET MIGRATICN A 360D-00.5.008 TSO ENHANCEMENT PACKAGE 360D-05.2.014 TUKEY FAST FOURIER TRAN 360D-13.4.002 TUKEY FAST FOURIER TRAN 360D-13.4.001 TWO-DIMENSIONAL TRIM PR 360D-23.1.003 TWO-STAGE, TWO-DIMENSIO 360D-23.1.003 UCARDS: UNION CARBIDE A 360D-16.0.001	
AN INTERFACE ENABLING *1 ( NEATER: A PL/I SOURCE	SSX3A/SSIP 360D-23.4.004 360D-23.4.004 360D-06.8.004 360D-23.1.003 360D-03.8.016 360D-03.2.016 360D-03.6.018 360D-03.0.010 360D-03.8.013 360D-06.6.003 360D-03.6.026 360D-99.0.009 360D-06.8.003 360D-45.0.001 360D-03.8.016 360D-03.8.016 360D-08.7.006 360D-08.7.003 360D-03.4.027 360D-08.6.003 360D-08.6.001 360D-40.0.003 360D-00.5.009 360D-17.2.006 360D-15.2.014 360D-17.2.006 360D-01.4.009 360D-01.4.009 360D-03.4.033 360D-00.4.019 370D-03.3.014 370D-03.3.015 360D-04.1.012 360D-03.0.015 360D-06.7.026 360D-03.2.015 360D-06.8.003 370D-00.0.024 360D-15.1.008 360D-03.6.019 360D-17.4.004 360D-06.7.027 360D-03.0.014	ITAL ANALOG SIMULATION 360D-23.4.004 A 360D-06.8.004 L FEATURE EMULATOR FOR 360D-03.8.016 GE FOR THE IBM 360/370 360D-03.2.016 DECTALB, A DECISION 360D-03.2.016 ANALYSIS AND EVALUATION 360D-03.6.018 LOCATION OF FACILITIES 360D-03.0.010 M ACCESS BINARY-SEARCH 360D-03.8.013 LOCATION OF FACILITIES 360D-06.6.003 SED ON LIST PROCESSING 360D-03.6.026 R EXECUTIVE SYSTEM FOR 360D-99.0.009 PULSE 360D-06.8.003 NSCRIPT - PRODUCES 360D-45.0.001 PRINT - A 360D-03.8.016 FORMAT, A 360D-03.8.016 ERSECTION DETECTION IN 360D-08.7.006 OTS - A SUBROUTINE FOR 360D-08.7.003 / SYSTEM MEASUREMENT / 360D-03.4.027 VE PROGRAMMING SYSTEM ( 360D-08.6.003 SHARING LANGUAGE/ONE ( 360D-08.6.001 N THREE DIMENSIONS - A 360D-40.0.003 BPS/DOS/ 360D-00.5.009 DASD ALTERNATE 360D-17.2.006 LEY-TUKEY FAST FOURIER 360D-15.2.014 LEY-TUKEY FAST FOURIER 360D-17.2.006 G VIA THE FAST FOURIER 360D-01.4.009 360D-01.4.009 360D-03.4.033 360D-00.4.019 370D-03.3.014 370D-03.3.015 360D-04.1.012 360D-03.0.015 360D-06.7.026 360D-03.2.015 360D-06.8.003 370D-00.0.024 360D-15.1.008 360D-03.6.019 360D-17.4.004 360D-06.7.027 360D-03.0.014	NTERACTIVE PROGRAMMING SYSTEM (TIPS) 360D-05.1.023 OPERATING SYSTEM ACCOUNTING 360D-01.4.003 SYSTEM FOR TELEPROCESSI 360D-05.1.018 SYSTEM FOR THE S/360 US 360D-00.6.011 SYSTEM MEASUREMENT / TI 360D-04.4.012 SYSTEM SHARED ENQUE 360D-05.2.015 SYSTEM TO OS/360 WITH C 360D-43.2.001 SYSTEM TO PROCESS ABSTR 360D-03.5.005 SYSTEM/360 MODEL 44 360D-11.3.015 SYSTEMS 360D-40.4.004 TABLE TRANSLATOR BASED 360D-03.6.022 TECHNIQUE 360D-23.0.003 TECHNIQUE (INCLUDING DE 360D-15.6.004 TECHNIQUE FOR SEQUENTIA 360D-06.7.018 TECHNIQUE, CRAFT 360D-15.6.003 TECHNIQUES 360D-03.6.022 TELEPROCESSING (BEST) 360D-05.1.018 TESTING VIA THE FAST FO 360D-16.3.002 TEXAS INTERACTIVE PROGR 360D-05.1.023 TEXT DATASETS IN MANUSC 360D-03.5.008 TEXT FORMATTING PROGRAM 360D-06.0.008 TEXT-PROCESSING PROGRAM 360D-06.0.007 THREE DIMENSIONS - A TO 360D-08.7.004 TIME SHARING LANGUAGE/O 360D-03.6.027 TIME-SERIES PLOTTING ON 360D-08.6.001 TIME-SHARING PERFORMANC 360D-04.4.012 TIPS) 360D-05.1.023 TL/1) 360D-03.6.027 TOOL FOR COMPUTER AIDED 360D-08.7.004 TOS FORTRAN FLOWCHART P 360D-00.2.001 TRACK ANALYSIS (ALTRAC 370D-00.4.020 TRANSFORM 360D-13.4.001 TRANSFORM 360D-13.4.002 TRANSFORM 360D-16.3.002 TRANSIENT ONE-DIMENSION 360D-17.4.003 TRANSIENT SOLUTIONS FOR 360D-15.0.005 TRANSLATION 360D-03.0.010 TRANSLATCR 360D-12.2.002 TRANSLATOR BASED ON LIS 360D-03.6.022 TRANSLATOR WRITING SYST 360D-03.6.019 TRANSLATCRS, SIMULATOR, 360D-99.0.009 TRIM PROGRAM II 360D-23.1.003 TSO ANALYSIS / SYSTEM M 360D-04.4.012 TSO DATASET MIGRATICN A 360D-00.5.008 TSO ENHANCEMENT PACKAGE 360D-05.2.014 TUKEY FAST FOURIER TRAN 360D-13.4.002 TUKEY FAST FOURIER TRAN 360D-13.4.001 TWO-DIMENSIONAL TRIM PR 360D-23.1.003 TWO-STAGE, TWO-DIMENSIO 360D-23.1.003 UCARDS: UNION CARBIDE A 360D-16.0.001
FORTRAN CHARACTER A PORTABLE MACRO-BASED PROGRAM COLLECTION: THE DATA PL/I BPROGRAMS, AND LIBRARY S TO FORTRAN PROGRAMS, NE PAGE GRAPH-PRINTING HISTOGRAM DISPLAY FORTRAN RANDOM I/O PLOT - A PLOTS - A HMETIC INTERPRETER AND LENGTH RECORD DELETION CERN SUMX - A DATA AND INTERVAL WEIGHTED- CERN	STRUCTURED FORTRAN EXTE 360D-03.6.026 STRUCTURED PROGRAMMING, 360D-99.0.009 STRUCTURES PROGRAMMING 360D-06.8.003 SUBPROCEDURE COLLECTION 360D-45.0.001 SUBPROGRAMS FROM OTHER 360D-03.8.016 SUBPROGRAMS, AND LIBRAR 360D-03.8.016 SUBROUTINE 360D-08.7.006 SUBROUTINE 360D-08.7.003 SUBROUTINE 360D-03.4.027 SUBROUTINE FOR PLOTTING 360D-08.6.003 SUBROUTINE FOR TIME-SER 360D-08.6.001 SUBROUTINE PACKAGE 360D-40.0.003 SUBROUTINE, VBDMLT 360D-00.5.009 SUMMARIZATION PROGRAM F 360D-17.2.006 SUMS LINEAR PROGRAMMING 360D-15.2.014 SUMX - A DATA SUMMARIZA 360D-17.2.006 SUPER-SCRATCH (SUPERSCR 360D-01.4.009 SUPERSCR) 360D-01.4.009 SUPPORT PACKAGE 360D-03.4.033 SUSAN, DISK MAPPING PRO 360D-00.4.019 SV (OS/MVT VERSION) MOD 370D-03.3.014 SV ASCII MODIFICATIONS 370D-03.3.015 SYMBOLIC DEBUGGING PACK 360D-04.1.012 SYSTEM 360D-03.0.015 SYSTEM 360D-06.7.026 SYSTEM 360D-03.2.015 SYSTEM 360D-06.8.003 SYSTEM 370D-00.0.024 SYSTEM 360D-15.1.008 SYSTEM 360D-03.6.019 SYSTEM 360D-17.4.004 SYSTEM (BIAS) 360D-06.7.027 SYSTEM (MPS) 360D-03.0.014	ERSECTION DETECTION IN 360D-08.7.006 OTS - A SUBROUTINE FOR 360D-08.7.003 / SYSTEM MEASUREMENT / 360D-03.4.027 VE PROGRAMMING SYSTEM ( 360D-08.6.003 SHARING LANGUAGE/ONE ( 360D-08.6.001 N THREE DIMENSIONS - A 360D-40.0.003 BPS/DOS/ 360D-00.5.009 DASD ALTERNATE 360D-17.2.006 LEY-TUKEY FAST FOURIER 360D-15.2.014 LEY-TUKEY FAST FOURIER 360D-17.2.006 G VIA THE FAST FOURIER 360D-01.4.009 360D-01.4.009 360D-03.4.033 360D-00.4.019 370D-03.3.014 370D-03.3.015 360D-04.1.012 360D-03.0.015 360D-06.7.026 360D-03.2.015 360D-06.8.003 370D-00.0.024 360D-15.1.008 360D-03.6.019 360D-17.4.004 360D-06.7.027 360D-03.0.014	ERSECTION DETECTION IN 360D-08.7.006 OTS - A SUBROUTINE FOR 360D-08.7.003 / SYSTEM MEASUREMENT / 360D-03.4.027 VE PROGRAMMING SYSTEM ( 360D-08.6.003 SHARING LANGUAGE/ONE ( 360D-08.6.001 N THREE DIMENSIONS - A 360D-40.0.003 BPS/DOS/ 360D-00.5.009 DASD ALTERNATE 360D-17.2.006 LEY-TUKEY FAST FOURIER 360D-15.2.014 LEY-TUKEY FAST FOURIER 360D-17.2.006 G VIA THE FAST FOURIER 360D-01.4.009 360D-01.4.009 360D-03.4.033 360D-00.4.019 370D-03.3.014 370D-03.3.015 360D-04.1.012 360D-03.0.015 360D-06.7.026 360D-03.2.015 360D-06.8.003 370D-00.0.024 360D-15.1.008 360D-03.6.019 360D-17.4.004 360D-06.7.027 360D-03.0.014
SUPER-SCRATCH ( 250 MODEL 1 SIMULATION	360D-01.4.009 360D-01.4.009 360D-03.4.033 360D-00.4.019 370D-03.3.014 370D-03.3.015 360D-04.1.012 360D-03.0.015 360D-06.7.026 360D-03.2.015 360D-06.8.003 370D-00.0.024 360D-15.1.008 360D-03.6.019 360D-17.4.004 360D-06.7.027 360D-03.0.014	NETUCC 1.1 - COOLEY- COOLEY- TWO-STAGE, 360D-03.0.014	360D-01.4.009 360D-01.4.009 360D-03.4.033 360D-00.4.019 370D-03.3.014 370D-03.3.015 360D-04.1.012 360D-03.0.015 360D-06.7.026 360D-03.2.015 360D-06.8.003 370D-00.0.024 360D-15.1.008 360D-03.6.019 360D-17.4.004 360D-06.7.027 360D-03.0.014
APL/ APL/ FORTRAN H ICAL EXPERIMENTAL META THE NRIMS ADDRESSING XPL COMPILER GENERATOR STRUCTURES PROGRAMMING PRESSED SOURCE LIBRARY SOL-370 SIMULATION NCE TRANSLATOR WRITING PHIC AUTOMATIC MAPPING R INFORMATION ANALYSIS MULTIPROGRAMMING	360D-01.4.009 360D-01.4.009 360D-03.4.033 360D-00.4.019 370D-03.3.014 370D-03.3.015 360D-04.1.012 360D-03.0.015 360D-06.7.026 360D-03.2.015 360D-06.8.003 370D-00.0.024 360D-15.1.008 360D-03.6.019 360D-17.4.004 360D-06.7.027 360D-03.0.014	NETUCC 1.1 - COOLEY- COOLEY- TWO-STAGE, 360D-03.0.014	360D-01.4.009 360D-01.4.009 360D-03.4.033 360D-00.4.019 370D-03.3.014 370D-03.3.015 360D-04.1.012 360D-03.0.015 360D-06.7.026 360D-03.2.015 360D-06.8.003 370D-00.0.024 360D-15.1.008 360D-03.6.019 360D-17.4.004 360D-06.7.027 360D-03.0.014

## KWIC (KEYWORD-IN-CONTEXT) INDEX

PAGE 8

TITLE	PROGRAM NO.	TITLE	PROGRAM NO.
IV CONVERSION PROBLEMS	UNDER OS/360	370 APT-AC (PTF3), APTL	370D-23.4.005
UCARDS:	UNION CARBIDE AUTOMATIC	370 ASSEMBLER LANGUAGE	360D-03.1.014
INTERFACE BETWEEN PL/I	UNIVAC-1108 TO IBM-360	SOL- 370 SIMULATION SYSTEM	360D-15.1.008
FOR ASSEMBLER LANGUAGE	USER PROGRAMS AND CALCO	370 SYSTEMS	360D-40.4.004
G SYSTEM FOR THE S/360	USERS	ROCKET - FORTRAN	360D-16.1.001
STRUCTURED PROGRAMMING,	USING THE 2250 DISPLAY	4) SPASM	360D-03.1.014
COMPARE DATA SET	UTILITIES, TRANSLATORS,	44	360D-11.3.015
	UTILITY	SHARE FORMAC/FORMAC/	360D-03.3.013
ES DIALLEL ANALYSIS OF	VARIABLE LENGTH RECORD		
D DELETION SUBROUTINE,	VARIANCE		
ME POINT ALGORITHM FOR	VBDMLT	END-OF-KWIC	
ROCKET - FORTRAN 4	VECTOR- MAXIMUM AND INT		
MODEL PROGRAM PACKAGE (	VERSION		
70 ASSEMBLER LANGUAGE (	VERSION 2)		
APL/SV (OS/MVT	VERSION 4), SPASM		
PULSE TESTING	VERSION) MODIFICATIONS		
DIRECT ACCESS	VIA THE FAST FOURIER TR		
AC MODIFICATIONS TO OS/	VOLUME COPY PROGRAM		
	VS LOADER		
	VS1 HASP		
	VTOC4MAT		
	V4.0 RETROFIT TO MFT-II		
HASP	V4M3/SSX3A/SSIP		
360 APT -	WATER FLOW IN SOILS		
MULTANEOUS SOLUTE AND	WAY ENCIPHERING ALGORIT		
ONE-	WEIGHTED-SUMS LINEAR PR		
- MAXIMUM AND INTERVAL	WORKSTATION FOR DISK I/		
ENHANCED HASP RTP1130	WRIMAT MATRIX WRITER		
	WRITER		
0 DASD EXPIRATION DATE	WRITER		
REPORT	WRITER		
WRIMAT MATRIX	WRITER MACROS		
PL/I REPORT	WRITING SYSTEM		
PRECEDENCE TRANSLATOR	XPL COMPILER GENERATOR		
THE	ZERO-ONE INTEGER PROGRA		
	ZEROS		
DETERMINING POLYNOMIAL	0 RETROFIT TO MFT-II		
HASP V4.	1		
E COLLECTION - RELEASE	1 (STAR-1) - LIST PROCE		
	1 - TSO ENHANCEMENT PAC		
	1 SIMULATION SUPPORT PA		
	1.1 - TSO ENHANCEMENT P		
	1)		
NETUCC 1.	1) - LIST PROCESSING LA		
A 2250 MODEL	1108 TO IBM-360 FLOATIN		
NETUCC	1627 PLOTTING ROUTINE		
ARING LANGUAGE/ONE (TL/	2)		
*1 (STAR-	20 MULTIUTILITY PROGRAM		
UNIVAC-	2250 DISPLAY		
PLT360; IBM	2250 MODEL 1 SIMULATION		
OGRAM PACKAGE (VERSION			
IBM S/360 MODEL			
OR THE S/360 USING THE			
A			

370D-00.0.024

## COMPRESSED SOURCE LIBRARY SYSTEM

AUTHOR: P. MICHAEL HENDERSON

## DIRECT TECHNICAL INQUIRIES TO:

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DESCRIPTION - THE COMPRESSED SOURCE LIBRARY SYSTEM ALLOWS A USER TO EASILY ADD, REPLACE OR CHANGE AND OPTIONALLY COMPILE/ASSEMBLE SOURCE CODE ON A DIRECT ACCESS COMPRESSED LIBRARY. IN ADDITION, A TRANSPORTABLE COPY OF THE SOURCE CODE IN UNCOMPRESSED EBCDIC FORM MAY ALSO BE PRODUCED. THE SYSTEM HAS PROVED TO BE ABLE TO PRODUCE COMPRESSION FACTORS OF ABOUT 3/1 FOR MOST PROGRAMMING LANGUAGES. THE SYSTEM WAS WRITTEN FOR AND TESTED ON AN IBM 370 MACHINE USING OS/360 MVT RELEASE 20.6 AND 21.6. THERE APPEARS TO BE NO REASON WHY THE SYSTEM WILL NOT OPERATE UNDER MFT OR VS1 BUT IT HAS NOT BEEN SUBMITTED TO ANY FORMAL TESTING ON EITHER SYSTEM, HOWEVER, THE SYSTEM AS WRITTEN WILL NOT OPERATE ON A 360 MACHINE DUE TO THE USE OF 370 INSTRUCTIONS. THE 370 INSTRUCTIONS ARE NOT IRREPLACABLE AND THE SYSTEM COULD BE CONVERTED TO OPERATE ON A 360 MACHINE BY A USER INSTALLATION IF DESIRED.

THE COMPRESSED SOURCE LIBRARY SYSTEM IS WRITTEN IN IBM OS/360 ASSEMBLER F AND REQUIRES THE IBM PROGRAMS IEBUPDTE, IEBCOPY, AND IEHMOVE TO GENERATE AND OPERATE THE SYSTEM.

PROGRAMMING LANGUAGE - OS/360 ASSEMBLER F

MINIMUM SYSTEM REQUIREMENTS - OS/360, S/370 HARDWARE

DOCUMENTATION: 52 PAGES, \$1.60 ADDITIONAL CHARGE.  
CARD COUNT: 8,850 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 2/74.

360E-00.1.016

## IBM S/360 MODEL 20 MULTIUTILITY PROGRAM

AUTHOR: R. KOLAR

## DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
CURRENTLY NOT AVAILABLE

DESCRIPTION - THE S/360 MULTIUTILITY PROGRAM IS A CORE-RESIDENT PROGRAM DESIGNED TO PERFORM THE FOLLOWING FUNCTIONS: LISTING, REPRODUCING, INTERPRETING, TRANSLATING, DECK SEQUENCING, AND MAILING LABEL PRODUCTION. ADDITIONAL LISTING OPTIONS INCLUDE - SINGLE SPACE (EBCDIC), DOUBLE SPACE (EBCDIC), SINGLE SPACE (BCD), SINGLE SPACE (HEXADECIMAL). THE DECK SEQUENCING PROGRAM IS NOT RESTRICTED TO THE TRADITIONAL FORMAT OF A 3 CHARACTER IDENTIFICATION FIELD AND A 5 DIGIT SEQUENCE NUMBER. THROUGH THE USE OF A CONTROL CARD, THE USER MAY SPECIFY THE IDENTIFICATION FIELD CONSTANT, THE STARTING VALUE FOR THE SEQUENCE NUMBERS, AND THE INCREMENT FOR THE SEQUENCE NUMBERS. THE ONLY RESTRICTION IS THAT THE IDENTIFICATION FIELD CONSTANT MUST BE AT LEAST 1 CHARACTER. A RESEQUENCING FACILITY IS ALSO PROVIDED. THE MAILING LABEL PROGRAM IS INDEPENDENT OF LABEL SIZE SINCE IT REQUIRES NO SPECIAL CARRIAGE TAPE. A CONTROL CARD IS USED TO SPECIFY THE LABEL SIZE, THE NAME FIELD, THE ADDRESS FIELD, AND THE CHARACTER WHICH IS USED AS A DELIMITER WITHIN THE ADDRESS FIELD. HENCE THE PROGRAM IS NOT RESTRICTED TO PROCESSING ADDRESS CARDS OF A PARTICULAR FORMAT. RESTRICTIONS ARE THAT ALL INFORMATION PERTAINING TO AN ADDRESS MUST BE PUNCHED ON A SINGLE CARD AND THE ADDRESS MAY NOT EXCEED 4 LINES.

ONCE THE PROGRAM IS LOADED, SEVERAL UTILITY FUNCTIONS CAN BE PERFORMED CONSEQUETIVELY BY INTERROGATING THE DATA SWITCHES ON THE CONSOLE. ANY OF THE FUNCTIONS - SINGLE SPACE (EBCDIC LIST), REPRODUCE, AND INTERPRET MAY BE PERFORMED SIMULTANEOUSLY ON A SINGLE PASS. THE PROGRAM USES A CARD SCANNING ALGORITHM TO DETERMINE THE DATA CONTENT OF EACH SOURCE CARD SO THAT THE REPRODUCING AND INTERPRETING FUNCTIONS ARE PERFORMED WITH A HIGHER DEGREE OF EFFICIENCY.

PROGRAMMING SYSTEMS - WRITTEN IN BASIC ASSEMBLER LANGUAGE.

MINIMUM SYSTEM REQUIREMENTS - 2020 CPU (4K), 2203 PRINTER (120 PRINT POSITIONS), 2560 MCFM (WITH INTERPRETING

CONTINUED FROM PRIOR COLUMN

FEATURE). THE PROGRAM CAN ALSO BE USED WITH OTHER INPUT/OUTPUT UNITS BY MODIFYING THE SOURCE DECK.

DOCUMENTATION: 18 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 100 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 07/68

360D-00.2.001

BPS/DOS/TOS FORTRAN FLOWCHART PROGRAM

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8TH STREET OFFICE BUILDING  
RICHMOND, VIRGINIA 23219

DESCRIPTION - THE BPS/DOS/TOS FORTRAN FLOWCHART PROGRAM IS INTENDED PRIMARILY AS A DEBUGGING DOCUMENTATION AID. IT ACCEPTS AS INPUT BPS, DOS, OR TOS FORTRAN SOURCE PROGRAMS AND PREPARES AUTOMATICALLY A BLOCK DIAGRAM FLOW CHART OF THE INPUT PROGRAM.

PROGRAMMING SYSTEMS - PROGRAM SOURCE LANGUAGE IS BPS FORTRAN BUT CAN ALSO BE USED AS A DOS/TOS FORTRAN PROGRAM SINCE NO STATEMENTS UNIQUE TO EITHER VERSION OF 360 FORTRAN ARE USED.

MINIMUM SYSTEM REQUIREMENTS - THOSE NEEDED FOR BPS/DOS/TOS FORTRAN ARE ADEQUATE.

DOCUMENTATION: 18 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 600 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 03/67

360D-00.4.014

CHANGE1 - OS/360 DASD EXPIRATION DATE WRITER

AUTHOR: J. E. NORTH

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WILLOW SPRINGS, ILL. 60480

DESCRIPTION - CHANGE1 WRITES AN EXPIRATION DATE FOR ANY DATASET RESIDING ON A DIRECT ACCESS VOLUME OF THE DEVICE TYPES SUPPORTED BY OS/360. THE PROGRAM HAS BEEN TESTED ON THE MODELS 40, 50, 65, AND 75 IN THE PCP.14, MFT-HASP.14, MVT.14, AND EMFT.13 ENVIRONMENTS. CHANGE1 RECEIVES ALL OF ITS INPUT FROM THE JCL WHICH INVOKES THE UTILITY. THE VTOC IS SEARCHED FOR A FORMAT-ONE OSCB WHOSE DSNAME IS THAT OF THE DD STATEMENT. THAT OSCB IS READ, THE NEW EXPIRATION DATE, OBTAINED FROM THE PARM PARAMETER OF THE EXEC STATEMENT, IS ADDED, AND THE DSCB IS WRITTEN BACK INTO THE VTOC. ONE EXPIRATION DATE IS WRITTEN PER STEP, AND THE TIME IS VIRTUALLY THAT OF THE SCHEDULER. CHANGE1 IS PRIMARILY A SYSTEMS PROGRAM, BUT IT CAN EASILY BE USED BY THE APPLICATIONS PROGRAMMER.

PROGRAMMING SYSTEMS - PROGRAMMING LANGUAGE - OS ASSEMBLER LANGUAGE. OPERATING SYSTEM - CS/360.

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED BY OS/360.

DOCUMENTATION: 4 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 200 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 09/68

360D-00.4.019

SUSAN, DISK MAPPING PROGRAM

AUTHOR: SUSAN CANTER

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RALEIGH, NORTH CAROLINA 27607



CONTINUED FROM PRIOR COLUMN

DESCRIPTION - SUSAN IS A PROGRAM THAT MAPS DATA SETS GIVING INFORMATION NEEDED TO RECREATE THE DATA SET, CREATION DATE, EXPIRATION DATE, NUMBER OF EXTENTS, AND TRACKS AND RECORDS USED. THIS INFORMATION CAN BE GIVEN FOR A SINGLE DATA SET, A GROUP OF DATA SETS, OR ALL DATA SETS FROM ONE TO TWENTY VOLUMES. OPTIONALLY, THE PROGRAM WILL LIST THE CATALOG ENTRIES (DATA SET NAME, DEVICE TYPE, AND VOLUME) AND LIST DIRECTORY USE INFORMATION ABOUT PDS'S. MEMBERS OF PDS'S CAN BE MAPPED TO SHOW NAMES AND ALIASES AND, FOR LOAD MODULES, SYSTEM STATUS BITS, ENTRY POINTS, SIZES, ETC. INFORMATION ABOUT THE INDEX TRACKS AND OVERFLOW AREAS AND REORGANIZATION STATISTICS ARE GIVEN FOR ISAM DATA SETS. SUSAN REQUIRES PL/I (F) OR VERSION 1, RELEASE 1.2 OR HIGHER OF THE OPTIMIZING COMPILER FOR COMPILATION. THE LOAD MODULE DISTRIBUTED WILL EXECUTE PROVIDING THAT THE PL/I TRANSIENT LIBRARY, PROGRAM NUMBER 5734-LM5, IS AVAILABLE.

WITH SUITABLE OS MODIFICATIONS TO OPEN, SUSAN WILL ALSO SHOW THE DATE OF THE LAST OPEN AND NUMBER OF TIMES OPENED.

PROGRAMMING LANGUAGE - PL/I

MINIMUM SYSTEM REQUIREMENTS - OS/360

DOCUMENTATION: 13 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 1480 CARDS APPROXIMATE.  
SUBMITTAL/REVISION DATE: 6/74

CONTINUED FROM PRIOR COLUMN

MINIMUM SYSTEM REQUIREMENTS - 370/V5 12K VIRTUAL.

DOCUMENTATION: 3 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 380 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 4/75.

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370D-00.4.021

DASD SEEK MAPPING AID (SEEKER)

AUTHOR: BILL SCHMIDT

DIRECT TECHNICAL INQUIRIES TO:

BILL SCHMIDT  
LITTON RESTON COMPUTER CENTER  
1831 MICHAEL FARADAY DRIVE  
RESTON, VA 22070

DESCRIPTION - THIS PROGRAM FACILITATES THE ATTACHMENT OF HARDWARE PROBES FOR SEEK MAPPING ON DASD SPINDLES. THE PROGRAM DOES ONE SEEK TO EACH HEAD ON THE VOLUME, STARTING FROM CCHH 0000. THERE IS NO OUTPUT FOR NORMAL PROGRAM COMPLETION. SEEKER HAS BEEN SUCCESSFULLY TESTED ON 3330-1 AND 3330-11. ONE EXCP IS PERFORMED TO EACH PHYSICAL TRACK IN BETWEEN TWO WTOR'S. THE WTOR'S ARE ISSUED TO ALLOW THE HARDWARE MONITOR TO BE STARTED AND STOPPED.

PROGRAMMING LANGUAGE - ASSEMBLER F.

MINIMUM SYSTEM REQUIREMENTS - 370/V5 12K VIRTUAL.

DOCUMENTATION: 3 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 225 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 4/75.

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370D-00.4.020

DASD ALTERNATE TRACK ANALYSIS (ALTTRACK)

AUTHOR: BILL SCHMIDT

DIRECT TECHNICAL INQUIRIES TO:

BILL SCHMIDT  
LITTON RESTON COMPUTER CENTER  
1831 MICHAEL FARADAY DRIVE  
RESTON, VA 22070

DESCRIPTION - THIS PROGRAM ANALYZES DASD VOLUME SURFACES FOR DEFECTIVE TRACKS. A LISTING OF ALL MARKED DEFECTIVES AND ASSIGNED ALTERNATES BY RELATIVE TRACK AND CCHH IS GENERATED. ALTTRACK HAS BEEN SUCCESSFULLY TESTED ON 2314, 3330-1, AND 3330-11.

PROGRAMMING LANGUAGE - ASSEMBLER F.

360D-00.5.007

## DIRECT ACCESS VOLUME COPY PROGRAM

AUTHOR: KARL BARNHARDT

## DIRECT TECHNICAL INQUIRIES TO:

KARL BARNHARDT  
 BELL TELEPHONE LABORATORIES, INC.  
 6200 E. BROAD ST.  
 COLUMBUS, OHIO 43213

DESCRIPTION - THIS UTILITY PROGRAM COMPRESSES USED DIRECT ACCESS SPACE ON AN OS VOLUME INTO CONTIGUOUS AREAS THEREBY GATHERING FREE AREAS INTO ONE OR MORE LARGER FREE AREAS. THIS IS DONE BY COPYING ALL DATA SETS FROM ONE DIRECT ACCESS VOLUME TO ANOTHER VOLUME OF THE SAME TYPE. INDEXED SEQUENTIAL AND UNMOVABLE DATA SETS ARE COPIED TO THE SAME LOCATION ON THE RECEIVING VOLUME AS THEY OCCUPIED ON THE ORIGINAL VOLUME. THE USED EXTENTS OF ALL REMAINING DATA SETS ARE ALLOCATED ON THE RECEIVING VOLUME STARTING AT THE FIRST AVAILABLE TRACK AFTER THE VOLUME LABEL AND PROCEEDING UPWARD. PARTITIONED DATA SETS ARE NOT COMPRESSED WHEN COPIED. IF A CATALOG DATA SET EXISTS IT IS ALLOCATED NEXT TO THE VTOC. ASSUMING SOME ORIGINAL FRAGMENTATION THE RESULT IS A DIRECT ACCESS VOLUME WITH LARGER CONTIGUOUS FREE AREAS. THE NUMBER OF RESULTING FREE AREAS DEPENDS ON THE NUMBER AND THE LOCATION OF LOCATION DEPENDENT DATA SETS.

PROGRAMMING LANGUAGE - OS ASSEMBLER (G OR H)

MINIMUM SYSTEM REQUIREMENTS - OS/360

DOCUMENTATION: 6 PAGES, NO ADDITIONAL CHARGE.

CARD COUNT: 1,100 APPROXIMATE.

SUBMITTAL/REVISION DATE: 7/73

360D-00.5.008

## TSO DATASET MIGRATION AND MAINTENANCE PACKAGE, FATSO

AUTHORS: MICHAEL W. ROHRER

JAMES E. REMMELL

## DIRECT TECHNICAL INQUIRIES TO:

MICHAEL W. ROHRER  
 LORENDAS PROJECT  
 VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY  
 BLACKSBURG, VIRGINIA 24061  
 TELEPHONE (703) 951-6506

DESCRIPTION - THE FATSO PACKAGE IS INTENDED TO PROVIDE A COMPREHENSIVE SET OF PROGRAMS FOR MAINTAINING DISK PACKS USED TO HOLD DATASETS GENERATED BY TSO USERS UNDER

OS/MVT/TSO. THE PACKAGE INCLUDES:

- THE PRIMARY MAINTENANCE PROGRAM, FATSO;
- A REPLACEMENT CSECT FOR IEHMOVE TO PERMIT DATASET MIGRATION TO OFF-LINE TAPE;
- A TSO COMMAND TO PERMIT RETRIEVAL OF MIGRATED DATASETS;
- TWO REPORT AND CATALOG MAINTENANCE PROGRAMS FOR MIGRATED DATASETS;
- FOUR TSO COMMAND PROCESSORS USED FOR DATASET MAINTENANCE;
- INFORMATION ON SEVERAL PERTINENT SUPERZAPS INCLUDED IN THE DOCUMENTATION.

ALL PROGRAMS ARE IN OS ASSEMBLER (F) EXCEPT THE TWO REPORTS, WHICH ARE IN PL/1 (F).

THE PACKAGE IS DESIGNATED TO RUN ON ANY IBM S/360 OR S/370 SYSTEM RUNNING OS/MVT/TSO, AND HAVING DISK AND TAPE UNITS. SOME CODE MAY REQUIRE MODIFICATION FOR A PARTICULAR INSTALLATION'S REQUIREMENTS, AND THESE PLACES HAVE BEEN CLEARLY MARKED IN THE COMMENTS ACCOMPANYING THE SOURCE CODE. FOR THE MOST PART, HOWEVER, THE CODE HAS BEEN KEPT INSTALLATION-INDEPENDENT.

DUE TO DEPENDENCE ON VARIOUS CS FEATURES AS WELL AS THE OS CATALOG, THE PACKAGE WILL NOT RUN ON VS/TSO.

PROGRAMMING LANGUAGE - OS ASSEMBLER (F), PL/1 (F).

MINIMUM SYSTEM REQUIREMENTS - OS/360 (MVT), TSO.

DOCUMENTATION: 5 PAGES, NO ADDITIONAL CHARGE.

(PLUS MACHINE READABLE DOCUMENTATION)

CARD COUNT: 6300 APPROXIMATE.

CONTINUED FROM PRIOR COLUMN

SUBMITTAL/REVISION DATE: 12/73.

360D-00.5.009

VARIABLE LENGTH RECORD DELETION SUBROUTINE, VBDM DLET

AUTHOR: MARK WITTE

DIRECT TECHNICAL INQUIRIES TO:

DOUGLAS KUNKEL  
LIBRARY SYSTEMS  
WASHINGTON STATE UNIVERSITY  
PULLMAN, WA 99163

DESCRIPTION - FOR INSTALLATIONS USING IBM COMPATIBLE DIRECT ACCESS STORAGE DEVICES (DASD) AND THE BASIC DIRECT ACCESS METHOD (BDAM), USERS OF VOLATILE FILES WITH KEYED, VARIABLE LENGTH RECORDS ARE FACED WITH THE PROBLEM OF WASTED STORAGE SPACE CAUSED BY 'LOGICAL' RECORD DELETION, WHICH EVENTUALLY REQUIRES EXPENSIVE FILE REORGANIZATION.

PASSED THE RECORD ADDRESS (MBBCHHR OR TTR) OF A RECORD TO BE DELETED, VBDM DLET WILL PHYSICALLY DELETE THE RECORD IN TWO (2) I/O COUNTS, REGARDLESS OF THE NUMBER OF RECORDS ON THE TRACK OR THE RELATIVE POSITION OF THE RECORD TO BE DELETED.

WRITTEN IN IBM 360 ASSEMBLER AND IMPLEMENTED FOR THE 2314 DASD ON AN IBM 360/67 WITH OS/MVT, THE ROUTINE IS DESIGNED TO BE DEVICE DEPENDENT AND MINIMIZE CORE USAGE. THUS DYNAMIC BUFFER ALLOCATION IS EMPLOYED. THE ROUTINE REQUIRES LESS THAN 2K OF CORE STORAGE, AND SINCE IT IS REENTRANT, IT IS SUITABLE FOR EITHER ON-LINE OR BATCH MODE APPLICATION.

VBDM DLET OFFERS THE USER CONSIDERABLE SAVINGS OVER FILE REORGANIZATION COSTS SINCE ONLY TWO I/O COUNTS ARE REQUIRED PER RECORD DELETED, AS OPPOSED TO FOUR I/O COUNTS FOR EACH RECORD RETAINED DURING REORGANIZATION.

PROGRAMMING LANGUAGE - OS ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - OS/360, 2314 OR EQUIVALENT

DOCUMENTATION: 27 PAGES, \$.35 ADDITIONAL CHARGE.  
CARD COUNT: 1650 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 8/74.

360D-00.6.008

IO2260 DISPLAY/ATTENTION PACKAGE

AUTHOR: H. A. GARNER

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
CURRENTLY NOT AVAILABLE.

DESCRIPTION - THE IO2260 DISPLAY/ATTENTION PACKAGE PROVIDES A MEANS FOR THE FORTRAN OR ASSEMBLY LANGUAGE PROGRAMMER TO CONTROL ANY NUMBER OF IBM 2260'S, WITH CALLS FROM FORTRAN, OR SIMILAR CODE IN ASSEMBLY PROGRESS, IN A 44/PS ENVIRONMENT.

PROGRAMMING SYSTEMS - OPERATING SYSTEM REQUIRED - UNMODIFIED 44/PS, AND USES THE IO AND SCHEDULING SERVICES OF THAT SYSTEM.

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED OF 44/PS.

DOCUMENTATION: 8 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 620 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 03/68

360D-00.6.011

A HYPERTEXT EDITING SYSTEM FOR THE S/360 USING THE 2250 DISPLAY

AUTHOR: ANDRIES VAN DAM

DIRECT TECHNICAL INQUIRIES TO:

PROFESSOR ANDRIES VAN DAM  
BOX F  
PROGRAM IN COMPUTER SCIENCE  
BROWN UNIVERSITY  
PROVIDENCE, R. I. 02912

DESCRIPTION - THE HYPERTEXT EDITING SYSTEM IS A MULTIPURPOSE TEXT HANDLING SYSTEM WHICH CAN BE USED FOR TEXT EDITING AND REVISION, INFORMATION RETRIEVAL, PROGRAMMED LEARNING, TYPESETTING (THROUGH IBM'S TEXT 360 PROGRAM), AND THE PRESENTATION OF NON-SEQUENTIAL FORMS OF WRITING, CALLED HYPERTEXT.

CONTINUED FROM PRIOR COLUMN

PROGRAMMING SYSTEM - THE SYSTEM WAS WRITTEN IN ASSEMBLY LANGUAGE.

MINIMUM SYSTEM REQUIREMENTS - THE SYSTEM WILL RUN ON THE IBM SYSTEM 360/40 AND UP WITH AT LEAST 128K OF CORE STORAGE, UNDER CONTROL OF PCP, MFT (IN A 108K PARTITION), OR MVT (IN A 108K REGION). IT CURRENTLY SUPPORTS EITHER THE 2250 MODEL I (WITH AN 8K BUFFER AND THE GRAPHIC DESIGN FEATURE) OR THE 2250 MODEL III, AND REQUIRES AT LEAST ONE 2311 OR 2314 DISK DRIVE, AND A 1403 PRINTER.

DOCUMENTATION: 80 PAGES, \$3.00 ADDITIONAL CHARGE.  
CARD COUNT: 30,000 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 05/69

360D-01.0.010

ONE-WAY ENCIPHERING ALGORITHM FOR PASSWORD PROTECTION

AUTHOR: H. D. KNOBLE

DIRECT TECHNICAL INQUIRIES TO:

H. D. KNOBLE  
214 COMPUTER BUILDING  
THE PENNSYLVANIA STATE UNIVERSITY  
UNIVERSITY PARK, PA 16802

DESCRIPTION - SUBROUTINE PURDY IS A RE-ENTERABLE SYSTEM UTILITY PROGRAM WHICH EVALUATES A FAMILY OF MATHEMATICALLY SOUND, ONE-WAY ENCIPHERING FUNCTIONS WITH KNOWN PROPERTIES. THE ALGORITHM IS IMPLEMENTED HERE TO ENABLE 8-CHARACTER PASSWORDS TO BE IRREVERSIBLY ENCIPHERED FOR SECURITY APPLICATIONS (COMPUTER RESOURCE AUTHORIZATIONS). UNLIKE MANY EXISTING METHODS USED FOR SEVERAL CURRENT OPERATING SYSTEM SECURITY APPLICATIONS (E.G. MVS PASSWORDS), THIS METHOD DOES NOT RELY ON KEEPING THE ALGORITHM OR LIST OF ENCIPHERED KEYS SECRET; THIS IS TRUE BECAUSE NO KNOWN ALGORITHM EXISTS TO INVERT THE ENCIPHERING FUNCTION, AND IF ONE WERE DISCOVERED, DECIPHERING A KEY WOULD STILL REQUIRE, ON THE AVERAGE, MANY YEARS OF CPU TIME ON MODERN, HIGH-SPEED EQUIPMENT. BECAUSE THE FAMILY ENCIPHERING FUNCTIONS UPON WHICH THIS ROUTINE IS BASED HAS ESSENTIALLY AN INFINITE NUMBER OF PARAMETERIZATIONS, THIS IMPLEMENTATION ALLOWS COMPUTER RESOURCE AUTHORIZATION TO BE INDEPENDENT AND UNIQUE ACROSS APPLICATIONS.

PROGRAMMING LANGUAGE - STANDARD 360 ASSEMBLER

CONTINUED FROM PRIOR COLUMN

MINIMUM SYSTEMS REQUIREMENTS - S/360 2K BYTES MEMORY

DOCUMENTATION: 13 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 1,000 CARDS APPROXIMATE.  
SUBMITTAL/REVISION DATE: 10/76

360D-01.4.003

OPERATING SYSTEM ACCOUNTING

AUTHOR: D. JACOBS

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
CURRENTLY NOT AVAILABLE.

DESCRIPTION - THIS PROGRAM WAS WRITTEN TO-

1. DETERMINE TASK TIME OF EACH STEP OF JOB.
2. DETERMINE WAIT/OVERHEAD TIME OF JOB.
3. INFORM OPERATOR OF TAPE ASSIGNMENTS BY DD NAME.
4. DETERMINE STARTING ADDRESS OF PROBLEM PROGRAM RE.
5. DETERMINE MAXIMUM TAPES AND DISKS USED IN JOB.
6. PRINT ACCOUNTING INFORMATION OF JOB ON SYSOUT AND SYSTEM RESIDENCE PACK.
7. PUNCH ACCOUNTING RECORDS FROM DISK.

STEP INITIATOR HAS BEEN MODIFIED SO THAT IT ACCOMPLISHES (3), (4), AND (5) ABOVE. IT ALSO ISSUES A TIMER MACRO PRIOR TO ISSUING THE "XCTL" TO THE PROBLEM PROGRAM. STEP TERMINATION ACCOMPLISHES (1) AND (2) ABOVE. JOB TERMINATION ACCOMPLISHES (7) ABOVE.

PROGRAMMING SYSTEMS - RUNS UNDER OS/360.

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED FOR OPERATING SYSTEM/360.

DOCUMENTATION: 14 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 1,650 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 11/66

360D-01.4.009

SUPER-SCRATCH (SUPERSCR)

AUTHOR: R. D. SEAWRIGHT

DIRECT TECHNICAL INQUIRIES TO:

R. D. SEAWRIGHT  
 INTERACTIVE DATA CORPORATION  
 486 TOTTEN POND ROAD  
 WALTHAM, MASS. 02154

DESCRIPTION - SUPERSCR IS DESIGNED TO SCRATCH ALL USER DATA SETS FROM A DIRECT ACCESS DEVICE OTHER THAN THOSE SPECIFICALLY REQUESTED TO REMAIN. A LIST OF DATA SET NAMES IS CONSTRUCTED AND PLACED IN EITHER OR BOTH OF TWO LOCATIONS:

- (1) SYS1.PROCLIB, MEMBER=SAVE.
- (2) SYSIN DD \* WHEN SUPERSCR IS EXECUTED.

THE LIST OF DATA SET NAMES ARE THOSE THAT THE USER WILL WANT PERMANENT TO THE SYSTEM.

FOR STATISTICAL PURPOSES A SEQUENTIAL DATA SET NAMED SYS1.STATLOG CAN BE ALLOCATED INTO WHICH SUPERSCR WILL WRITE INFORMATION CONCERNING ANY PURGING OF THE DIRECT ACCESS FILES. THIS FEATURE IS OPTIONAL TO THE USER.

SUPERSCR HAS BEEN TESTED SUCCESSFULLY ON SYSTEM/360 MODELS 40, 50, AND 65 RUNNING OS/360 PCP OR MFT/I. SUPERSCR WILL RUN IN THE MINIMUM OS/360 SCHEDULER PARTITION. PROGRAM EXECUTION TIME IS NEGLIGIBLE.

PROGRAMMING SYSTEMS - RUNS UNDER OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 MODEL 40.

DOCUMENTATION: 16 PAGES, NO ADDITIONAL CHARGE.  
 CARD COUNT: 700 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 02/68

360D-01.4.012

CHGPASS COMMAND PROCESSOR

AUTHOR: ARNIE BERG

DIRECT INQUIRIES TO:

ARNIE BERG  
 SASKCOMP  
 2112 8TH STREET E  
 SASKATOON, SASKATCHEWAN  
 CANADA

DESCRIPTION - THE CHGPASS COMMAND PROCESSOR IS DESIGNED TO ALLOW THE TSO USER TO CHANGE ANY OF HIS LOGON PASSWORDS. THE USER MAY NOT ADD A PASSWORD. THE PROGRAM IS WRITTEN IN ASSEMBLER (F).

PROGRAMMING LANGUAGE - ASM(F)

MINIMUM SYSTEM REQUIREMENTS - S/360, TSO

DOCUMENTATION: 3 PAGES, NO ADDITIONAL CHARGE.  
 (PLUS MACHINE READABLE DOCUMENTATION)  
 CARD COUNT: 450 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 5/76

360D-01.6.005

VTOC4MAT

AUTHOR: M. WAPNITSKY

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
 CURRENTLY NOT AVAILABLE

DESCRIPTION - THE VTOC4MAT UTILITY PROGRAM WAS WRITTEN IN ASSEMBLY LANGUAGE TO PRODUCE A READABLE LIST OF THE VTOC (VOLUME TABLE OF CONTENTS) ON ANY 2311 OR 2314 DEVICE.

PROGRAMMING SYSTEMS - WRITTEN IN ASSEMBLER LANGUAGE AND OPERATES UNDER OS/360.

MINIMUM SYSTEM REQUIREMENTS - A CARD READER (OR OTHER SUITABLE SOURCE OF INPUT), A PRINTER AND A 2311 OR 2314

CONTINUED FROM PRIOR COLUMN

DIRECT ACCESS DEVICE.

DOCUMENTATION: 5 PAGES, \$.25 ADDITIONAL CHARGE.  
CARD COUNT: 700 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 08/68

360D-01.6.008

PROCESS MEMBERS OF PARTIONED DATA SETS WITH PL/I

AUTHOR: MICHAEL BATE

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
CURRENTLY NOT AVAILABLE.

DESCRIPTION - THIS ASSEMBLY LANGUAGE SUBROUTINE ALLOWS PL/I PROGRAMMERS (OPTIMIZER OR CHECKOUT) TO PROCESS ANY NUMBER OF MEMBERS OF PARTITIONED DATA SETS, WITHOUT THE NEED OF EITHER (A) PROVIDING A DD CARD FOR EACH MEMBER OR (B) OPENING AND CLOSING THE DATA SET BETWEEN MEMBERS. MEMBERS MAY BE READ, WRITTEN, UPDATED IN PLACE, OR SCRATCHED. RECORD FORMATS F, FB, FS, FBS, V, VB, OR U CAN BE USED.

PROGRAMMING LANGUAGE - BAL (CALLED FROM PL/I OPTIMIZER-CHECK)

MINIMUM SYSTEM REQUIREMENTS - OS PL/I OPTIMIZER OR CHECKOUT ENVIRONMENT

DOCUMENTATION: 3 PAGES, NO ADDITIONAL CHARGE.  
(PLUS MACHINE READABLE DOCUMENTATION)  
CARD COUNT: 825 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 11/75

360D-03.0.010

STENO TO ENGLISH TRANSLATION

AUTHOR: OFFICE OF JOINT COMPUTER SUPPORT

DIRECT TECHNICAL INQUIRIES TO:

W. EISNER  
OFFICE OF DATA PROCESSING  
CENTRAL INTELLIGENCE AGENCY  
WASHINGTON, DC 20505

DESCRIPTION - THE S/360 STENO TO ENGLISH PROGRAM IS DESIGNED TO TRANSLATE STENOGRAPHIC INPUT INTO ENGLISH OUTPUT. THE OUTPUT TAKES FORM IN ALL UPPER CASE WITH AN @ SIGN REPRESENTING INITIAL CAPITALIZATION.

PROGRAMMING SYSTEMS - WRITTEN IN ALC AND HAS BEEN COMPILED AND TESTED USING OS VERSION 17 ON A S/360 MODEL 40, 50 AND 65 SYSTEM.

MINIMUM SYSTEM REQUIREMENTS - STENO PROGRAM SHOULD RUN ON ANY S/360 MODEL 30 AND UP. AN ON-LINE PRINTER, 132 PRINT POSITIONS, CONSOLE TYPEWRITER, AND ONE TAPE AND 2314 DISK DRIVE ARE REQUIRED.

DOCUMENTATION: 50 PAGES, \$1.50 ADDITIONAL CHARGE.  
CARD COUNT: 550 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 06/69

360D-03.0.014

MULTIPROGRAMMING SYSTEM (MPS)

AUTHOR: DR. M.W. SACHS

DIRECT TECHNICAL INQUIRIES TO:

DR. M.W. SACHS  
NUCLEAR STRUCTURE LABORATORY  
YALE UNIVERSITY  
NEW HAVEN, CONNECTICUT 06520

DESCRIPTION - MPS IS A MULTIPROGRAMMED OPERATING SYSTEM FOR THE 360 MODEL 44. THE SYSTEM, DESIGNED FOR REAL TIME DATA ACQUISITION, SUPPORTS MULTIPLE USERS IN A FULLY PROTECTED ENVIRONMENT. FEATURES OF THE SYSTEM INCLUDE DYNAMIC STORAGE ALLOCATION, RE-ENTRANT SUPERVISOR, FORTRAN COMPILER, LOADER EDITOR JOB CONTROL PROCESSOR, VIRTUAL

CONTINUED FROM PRIOR COLUMN

DEVICE UTILITIES, INTERTASK COMMUNICATION FACILITIES AND OPERATOR CONTROL PROGRAMS.

PROGRAMMING SYSTEMS - 360/44 PROGRAMMING SYSTEM.

MINIMUM SYSTEM REQUIREMENTS - THE SYSTEM REQUIRES AT LEAST 64K BYTES OF CORE, FLOATING POINT FEATURE, STORAGE PROTECTION, READER, PUNCH, PRINTER, ONE SDS, ONE OTHER RANDOM ACCESS DRIVE AND ONE TAPE FOR SYSTEM MAINTENANCE.

DOCUMENTATION: 62 PAGES, \$2.10 ADDITIONAL CHARGE.  
CARD COUNT: 105,200 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 10/69  
REQUIRES 1200 FT. TAPE FOR DISTRIBUTION.

CONTINUED FROM PRIOR COLUMN

GEMS. AND SECOND, A DRAWING SYSTEM FOR SYNTHESIZING DIGITAL PICTURES FOR PATTERN RECOGNITION EXPERIMENTS IS ALSO DEFINED AND IMPLEMENTED USING THE MODEL. THE USE OF BOTH IMPLEMENTATIONS IS ILLUSTRATED IN BOTH INTERACTIVE AND SLAVE MODES; DEVICE DEPENDENCE IS ALSO ILLUSTRATED FOR BOTH APPLICATIONS.

PROGRAMMING LANGUAGE - PL/I (F LEVEL)

MINIMUM SYSTEM REQUIREMENTS - OS/360

DOCUMENTATION: 193 PAGES, \$8.65 ADDITIONAL CHARGE.  
CARD COUNT: 4,250 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 5/73

360D-03.0.015

GEMS - A GRAPHICAL EXPERIMENTAL META SYSTEM

AUTHOR: JAMES E. GEORGE

DIRECT TECHNICAL INQUIRIES TO:  
DR. JAMES E. GEORGE  
LOS ALAMOS SCIENTIFIC LABORATORY  
P.O. BOX 1663, MS 272  
LOS ALAMOS, NEW MEXICO 87545

DESCRIPTION - THE IMPLEMENTATION OF GRAPHICAL LANGUAGES AND GRAPHICAL SYSTEMS HAS BECOME TOO COMPLEX TO PERMIT ECONOMICAL EXPERIMENTATION WITH MANY NEW LANGUAGES OR SYSTEMS. FURTHER, MANY APPLICATIONS FUNCTION ONLY AS AN INTERACTIVE STAND ALONE SYSTEM OR AS A SLAVE SYSTEM; SOME ARE FURTHER RESTRICTED TO PARTICULAR INPUT OR OUTPUT DEVICES.

A MODEL FOR GRAPHICAL SYSTEMS WITH A LINGUISTIC BASE IS PRESENTED; THE MODEL PROVIDES SYMMETRY BETWEEN RECOGNITION AND GENERATION OF PICTURES, ALTHOUGH EMPHASIZING GENERATION. THIS MODEL FACILITATES A MORE ECONOMICAL EXPERIMENTATION WITH GRAPHICAL SYSTEMS WITH A LINGUISTIC BASE AND PROVIDES DEVICE DEPENDENCE. A GRAPHICAL SYSTEM DEFINED UTILIZING GEMS CAN FUNCTION INTERACTIVELY OR AS A SLAVE SYSTEM.

THE MODEL IS IMPLEMENTED BY DEFINING ITS COMPONENTS UTILIZING A SIMPLE PRECEDENCE TRANSLATOR WRITING SYSTEM. THIS IMPLEMENTED GRAPHICAL MODEL IS ILLUSTRATED BY TWO APPLICATIONS. FIRST, A TWO DIMENSIONAL MATHEMATICAL EXPRESSION DISPLAY SYSTEM IS DEFINED AND IMPLEMENTED USING

360D-03.1.014

FAST-ASSEMBLER-INTERPRETER FOR S/360 AND S/370 ASSEMBLER LANGUAGE (VERSION 4), SPASM

AUTHOR: JOHN R. EHRMAN

DIRECT TECHNICAL INQUIRIES TO:  
DR. JOHN R. EHRMAN  
STANFORD CENTER FOR INFORMATION PROCESSING  
SLAC - BIN 97  
P.O. BOX 4349  
STANFORD, CALIF. 94305

DESCRIPTION - THE FAST SINGLE-PASS ASSEMBLER-INTERPRETER SYSTEM PROVIDES A PROCESSOR FOR THE SYSTEM/360/370 ASSEMBLER LANGUAGE WITH THE FOLLOWING FEATURES: (1) ALMOST FULL LANGUAGE COMPATIBILITY (INCLUDING LITERALS, MACROS, CSECTS AND DSECTS) WITH THE OS ASSEMBLER LANGUAGE, (2) EXTREMELY HIGH ASSEMBLY RATE, (3) AN OPTIONALLY INVOKED INTERPRETER FOR THE SYSTEM/360/370 INSTRUCTION SET, (4) EXTENSIVE AND DETAILED ASSEMBLY-TIME AND EXECUTION-TIME DIAGNOSTIC MESSAGES AND FACILITIES, (5) SIMPLE MACRO-LIKE INSTRUCTIONS FOR DIAGNOSTIC AND INPUT/OUTPUT OPERATIONS, (6) AN EXTENDED SYNTAX FOR DC AND DS STATEMENTS, (7) A SUB-MONITOR WHICH PERMITS BATCHED ASSEMBLIES AND EXECUTIONS, AND (8) EXTENSIONS TO THE ASSEMBLER LANGUAGE. THE FEW RESTRICTIONS ON THE LANGUAGE DERIVE FROM THE ONE-PASS LOAD-AND-GO NATURE OF THE ASSEMBLER.

THE SYSTEM IS RE-ENTRANT AND REQUIRES 65K BYTES (DEPENDING ON THE OPTIONS SELECTED) PLUS A WORKSPACE WHOSE SIZE IS AN INVOCATION PARAMETER: FOR MOST STUDENT PROGRAMS AN

CONTINUED FROM PRIOR COLUMN

ADDITIONAL 10K IS AMPLE. ALL I/O USES QSAM, AND THE SYSTEM IS PROGRAMMED ENTIRELY IN ASSEMBLER LANGUAGE.

A GUIDE TO THE USE OF THE SYSTEM IS INCLUDED AS A FILE ON THE DISTRIBUTION TAPE.

PROGRAMMING LANGUAGE - OS ASSEMBLER F.

MINIMUM SYSTEM REQUIREMENTS - OS/360 OR DOS/360.

DOCUMENTATION: 3 PAGES, NO ADDITIONAL CHARGE.  
(PLUS MACHINE READABLE DOCUMENTATION)  
CARD COUNT: 32,750 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 4/73

360D-03.2.008

KINETIC SIMULATION LANGUAGE FOR CHEMISTRY AND BIOCHEMISTRY

AUTHOR: C.G. ROMAN

DIRECT TECHNICAL INQUIRIES TO:

D. GARFINKEL (215) 243-8122  
C. B. MARBACH (215) 886-0200  
MOORE SCHOOL OF ELECTRICAL ENGINEERING  
UNIVERSITY OF PENNSYLVANIA  
PHILADELPHIA, PA 19174

DESCRIPTION - THIS IS A SECOND REVISION OF A PROBLEM ORIENTED LANGUAGE FOR CONTINUOUS SIMULATION OF THE KINETICS OF CHEMICAL AND BIOCHEMICAL SYSTEMS. IT TRANSLATES CHEMICAL REACTIONS INTO DIFFERENTIAL EQUATIONS, SOLVES THEM BY NUMERICAL METHODS STARTING FROM SPECIFIED INITIAL CONDITIONS, AND EDITS THE RESULTS. THE STIFF DIFFERENTIAL EQUATION SOLVING METHOD OF GEAR IS INCLUDED WITH MODIFICATIONS (ROMAN ET AL., PROC. NCC, 1976, P. 793) TO SPEED THE SOLUTION AND DECREASE THE CORE MEMORY REQUIREMENT FOR LARGE PROBLEMS. THE PROGRAM AS SUBMITTED IS BATCH-PROCESSOR AND CARD-INPUT ORIENTED, IS WRITTEN IN FORTRAN AND HAS BEEN "STRUCTURED" FOR EASE OF PROGRAMMER INTERVENTION. IT SHOULD RUN ON ANY LARGE BATCH-PROCESSING MACHINE WITH FORTRAN LEVEL G OR ABOVE. A DESCRIPTION OF THE ORIGINAL VERSION HAS BEEN PUBLISHED (COMPUTERS AND BIOMEDICAL RESEARCH, 2 31, 1968); A REVISED DESCRIPTION WILL BE SUBMITTED SOON.

PROGRAMMING LANGUAGE - FORTRAN

CONTINUED FROM PRIOR COLUMN

MINIMUM SYSTEM REQUIREMENTS - SEE ABSTRACT

DOCUMENTATION: 137 PAGES, \$5.85 ADDITIONAL CHARGE.  
CARD COUNT: 11,000 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 6/76

360D-03.2.014

THE SIMSCRIPT II PROGRAMMING LANGUAGE

AUTHOR: P. J. KIVIAT

DIRECT TECHNICAL INQUIRIES TO:

P. J. KIVIAT  
DEPARTMENT OF THE AIR FORCE  
FEDERAL COMPUTER PERFORMANCE  
EVALUATION AND SIMULATION CENTER  
WASHINGTON, DC 20330

DESCRIPTION - THE SIMSCRIPT II COMPILER TRANSLATES SOURCE LANGUAGE INPUTS INTO ASSEMBLY PROGRAMS WHICH ARE ASSEMBLED BY AN OS MULTIPLE-ASSEMBLER INTO LINK-EDITABLE MODULES.

PROGRAMMING SYSTEMS - WRITTEN IN SIMSCRIPT II AND HAS BEEN COMPILED AND TESTED USING OS VERSION 15/16 ON A S/360 MODEL 65. IT WILL RUN UNDER MVT, MFT OR PCP. THE PROGRAM SHOULD BE STORED IN THE USER'S LOAD LIBRARY AND CALLED OUT LATER BY THE COMPILE PROCEDURES.

MINIMUM SYSTEM REQUIREMENTS - COMPILATION REQUIRES CORE STORAGE OF AT LEAST 150K BYTES.

DOCUMENTATION: 57 PAGES, \$1.85 ADDITIONAL CHARGE.  
CARD COUNT: 19,090 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 06/72



CONTINUED FROM PRIOR COLUMN

360D-03.2.015

## THE XPL COMPILER GENERATOR SYSTEM

AUTHORS: W. M. MCKEEMAN  
J. J. HORNING  
D. B. WORTMAN

## DIRECT TECHNICAL INQUIRIES TO:

PROFESSOR W. M. MCKEEMAN  
INFORMATION SCIENCES  
UNIVERSITY OF CALIFORNIA  
SANTA CRUZ, CALIFORNIA 95064

DESCRIPTION - THE XPL SYSTEM IS A COMPLETE COMPILER GENERATOR, DESIGNED TO FACILITATE THE PRODUCTION OF EFFICIENT SYNTAX-DIRECTED COMPILERS FOR THE S/360. THE SYSTEM CONSISTS OF A DIALECT OF PL/I CALLED XPL DESIGNED TO BE CONVENIENT FOR WRITING TRANSLATORS: A COMPILER (XCOM) FROM XPL INTO S/360 MACHINE LANGUAGE; A SMALL OS/360 ASSEMBLY LANGUAGE SUB-MONITOR WHICH PROVIDES THE INTERFACE BETWEEN XPL PROGRAMS AND OS/360; A PROGRAM (ANALYZER) WHICH BUILDS PARSING DECISION TABLES DIRECTLY FROM ENF GRAMMARS; AND A TABLE DRIVEN PARSING ALGORITHM EMBEDDED IN A PROTO-COMPILER (SKELETON); AND SEVERAL UTILITY PROGRAMS TO AID IN USING THE SYSTEM UNDER OS/360. THE XPL SYSTEM WAS DEVELOPED TO RUN UNDER OS/360 RELEASE 20 MFT II. IT WILL RUN UNDER OS/360 ON ANY S/360 WITH THE UNIVERSAL INSTRUCTION SET, DIRECT ACCESS STORAGE (2311, 2314, OR 2321), AND AT LEAST 128K BYTES OF STORAGE (ALTHOUGH MORE STORAGE ENHANCES SYSTEM PERFORMANCE). THE SYSTEM AS DISTRIBUTED ASSUMES 2311 DISKS AND WILL RUN UNCHANGED ON 2314 DISKS. PROGRAMS AND INSTRUCTIONS ARE PROVIDED FOR ADAPTING THE SYSTEM TO WORK WITH OTHER 2311 DISKS. ALL MAJOR COMPONENTS OF THE SYSTEM EXCEPT A SMALL ASSEMBLY-LANGUAGE SUBMONITOR ARE WRITTEN AND COMPILED BY XCOM. THE SYSTEM MAY BE ADAPTED TO RUN UNDER OPERATING SYSTEMS OTHER THAN OS/360 BY WRITING A NEW VERSION OF THE SUBMONITOR. SINCE XCOM WAS WRITTEN IN XPL ITS PERFORMANCE (3500-6000 CARDS/MINUTE COMPILATION RATE UNDER HASP ON A 360/65) IS TYPICAL OF COMPILERS PRODUCED BY THE XPL SYSTEM. A BRIEF DESCRIPTION IS CONTAINED IN THE "THE XPL COMPILER GENERATOR SYSTEM" BY MCKEEMAN ET AL, PROCEEDINGS OF THE 1968 FALL JOINT COMPUTER CONFERENCE. FULL DOCUMENTATION IS GIVEN BY 'A COMPILER GENERATOR' BY MCKEEMAN, HORNING, AND WORTMAN (PRENTICE HALL, NOVEMBER 1970). THE SYSTEM WAS DEVELOPED AT STANFORD UNIVERSITY AND AT THE UNIVERSITY OF CALIFORNIA AT SANTA CRUZ. IT HAS BEEN IN USE AT STANFORD SINCE 1967 AND AT OTHER INSTALLATIONS SINCE NOVEMBER 1967.

## PROGRAMMING SYSTEMS - PROGRAMMING LANGUAGE - OS, XPL

MINIMUM SYSTEM REQUIREMENTS - ANY S/360 WITH UNIVERSAL INSTRUCTION SET, DIRECT ACCESS STORAGE (2311, 2314, OR 2321) AND AT LEAST 128K BYTES OF STORAGE.

DOCUMENTATION: 14 PAGES, NO ADDITIONAL CHARGE.  
NOT AVAILABLE ON CARDS.

SUBMITTAL/REVISION DATE: 01/72

360D-03.2.016

## \*1 (STAR-1) - LIST PROCESSING LANGUAGE

AUTHOR: RICHARD A. STONE

## DIRECT TECHNICAL INQUIRIES TO:

D. S. HOUSEL  
WESTERN ELECTRIC CO., INC.  
P. O. BOX 900  
PRINCETON, N. J. 08540

DESCRIPTION - \*1 (CARNEGIE-MELLON DESCENDANT OF BELL LABORATORIES' L6) IS A HIGHLY SPEED AND SPACE EFFICIENT LIST PROCESSING LANGUAGE. IT IS LOW LEVEL AND EASILY LEARNED YET PROGRAMS ARE MACHINE AND DATA INDEPENDENT. LINKAGE IS PROVIDED TO OTHER PROGRAMMING LANGUAGES TO ALLOW WRITING OF EFFICIENT LIST PROCESSING SUBROUTINES. THE COMPILER IS WRITTEN IN SNOBOL4 AND WILL RUN ON ANY MACHINE WITH THAT LANGUAGE AVAILABLE. RUNNING UNDER SPITBOL (OBJECT MODULES PROVIDED ON TAPE), IT REQUIRES 125K UNDER OS/360. ASSEMBLY LANGUAGE MAY BE PRODUCED FOR THE IEM 360/370 AND THE DEC PDP-10 AND PDP-11. TAPE INCLUDES OBJECT MODULES, SOURCE, AND MACHINE READABLE TEXT.

## PROGRAMMING LANGUAGE - SNOBOL 4

MINIMUM SYSTEM REQUIREMENTS - OS/360

DOCUMENTATION: 160 PAGES, \$7.00 ADDITIONAL CHARGE.  
CARD COUNT: 9,922 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 5/73

CONTINUED FROM PRIOR COLUMN

360D-03.2.017

PAPER SAVING MODIFICATIONS TO FORTRAN H AND G WITH  
NOSOURCE OPTION

AUTHOR: CHESTER M. SMITH, JR.

DIRECT TECHNICAL INQUIRIES TO:

CHESTER M. SMITH, JR.  
214 COMPUTER BUILDING  
THE PENNSYLVANIA STATE UNIVERSITY  
UNIVERSITY PARK, PA 16802

DESCRIPTION - THE AMOUNT OF PAPER GENERATED BY THE FORTRAN G AND H COMPILERS UNDER THE NOSOURCE OPTION IS EXTREMELY WASTEFUL. IBM APPEARS UNWILLING TO DO ITS PART IN CONSERVING NATURAL RESOURCES AND MONEY BY MODIFYING THE COMPILERS. THE PENNSYLVANIA STATE UNIVERSITY COMPUTATION CENTER THEREFORE DECIDED TO SEE WHAT THE PROBLEM WOULD ENTAIL. THE MODIFICATIONS TO REDUCE PAPER WASTE WITH NOSOURCE REQUIRED NINE SOURCE CHANGES IN THE MODULE IEKFCOS, AND FIVE CHANGES TO IEYFORT.

PROGRAMMING LANGUAGE - OS ASSEMBLER.

MINIMUM SYSTEM REQUIREMENTS - OS/360/MVT (MODS TO REL 21.7)

DOCUMENTATION: 4 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 2,400 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 6/74.

AND W. M. RUHSAM. IEEE TRANS. EWS. VOL. EWS-11,2,45,1968, M. P. BARNETT. COMPUTER PROGRAMMING IN ENGLISH. HARCOURT, BRACE & WORLD, MAY 1969). WHEN COMPILED IT CONSISTS OF A ROOT SEGMENT OF 56K BYTES, THE TRANSLATOR SEGMENT OF 45K BYTES (THAT CONVERTS SNAP PROCEDURES INTO THE NUMERICAL SNAPIC CODE) AND THE INTERPRETER SEGMENT OF 48K BYTES THAT CAN BE OVERLAYED WITH THE TRANSLATOR. SNAP INSTRUCTIONS TO PUNCH CARDS AND PAPER TAPE, TO READ AND WRITE MAGNETIC TAPE AND DIRECT ACCESS DEVICES, AND TO PUNCH PAPER TAPE CAN BE USED IN SNAP PROCEDURES THAT ARE RUN ON EQUIPMENT WITH APPROPRIATE UNITS. THE COMPILED PROCESSOR CAN BE STORED IN A LANGUAGE LIBRARY AND USED CONVENIENTLY UNDER OS/360. IT HAS BEEN USED EXTENSIVELY FOR CLASS EXERCISES AT COLUMBIA UNIVERSITY.

PROGRAMMING SYSTEMS - WRITTEN IN FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - 128K CORE STORAGE, CARD READER, LINE PRINTER AND 1 TAPE DRIVE (OR AN EQUIVALENT DRUM OR DISC).

DOCUMENTATION: 22 PAGES, \$.10 ADDITIONAL CHARGE.  
CARD COUNT: 6,750 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 04/69

360D-03.3.011  
COMIT/360

AUTHOR: D. RITCHIE

DIRECT TECHNICAL INQUIRIES TO:

DEAN RITCHIE  
COMPUTING CENTER  
WASHINGTON STATE UNIVERSITY  
PULLMAN, WASHINGTON 99163

360D-03.3.010

SNAP PROCESSOR (PROTOTYPE)

AUTHORS: W. M. RUHSAM M. P. BARNETT

DIRECT TECHNICAL INQUIRIES TO:

PROFESSOR MICHAEL P. BARNETT  
SCHOOL OF LIBRARY SCIENCE  
ROOM 516 BUTLER LIBRARY  
COLUMBIA UNIVERSITY  
NEW YORK, NY 10027

DESCRIPTION - THE SNAP PROCESSOR EXECUTES PROCEDURES WRITTEN IN THE SNAP LANGUAGE A "BASIC ENGLISH" FOR LIBRARIANS, EDUCATORS, PUBLISHERS AND OTHERS TO INSTRUCT THE COMPUTER TO PERFORM MECHANICAL TEST PROCESSING. (SEE M. P. BARNETT

DESCRIPTION - COMIT/360 IS A CONVERSION OF COMIT II DISTRIBUTED THROUGH THE INSTITUTE FOR COMPUTER RESEARCH, UNIVERSITY OF CHICAGO. IT PROVIDES THE STRING MANIPULATION AND LIST PROCESSING FACILITIES OF COMIT FOR USERS OF SYSTEM/360. FOR A COMPLETE DOCUMENTATION OF COMIT II, CONTACT THE INSTITUTE OF COMPUTER RESEARCH, UNIVERSITY OF CHICAGO.

PROGRAMMING SYSTEMS - WRITTEN IN ASSEMBLER LANGUAGE AND HAS BEEN COMPILED AND TESTED USING OS RELEASE 14 ON A

CONTINUED FROM PRIOR COLUMN

SYSTEM/360 MODEL 67.

MINIMUM SYSTEM REQUIREMENTS - REQUIRES A COMMERCIAL OR UNIVERSAL INSTRUCTION SET (DECIMAL FEATURE) AND WILL REQUIRE REASSEMBLING ON A SYSTEM/360 WITH LESS THAN 256K BYTES OF STORAGE.

DOCUMENTATION: 7 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 17,070 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 06/69

360D-03.3.013

SHARE FORMAC/FORMAC73

AUTHOR: DR. KNUT A. BAHR

DIRECT TECHNICAL INQUIRIES TO:

H.D. NOBLE  
214 COMPUTER BUILDING  
THE PENNSYLVANIA STATE UNIVERSITY  
UNIVERSITY PARK, PA 16802

DESCRIPTION - FORMAC (FORMULA MANIPULATION COMPILER) IS A SYMBOLIC ALGEBRAIC MANIPULATION SYSTEM CAPABLE OF TAKING GENERAL PARTIAL DERIVATIVES, PERFORMING EXACT RATIONAL ARITHMETIC, AND IN GENERAL ENAILING MANY TEDIOUS ALGEBRA AND CALCULUS PROBLEMS TO BE COMPUTERIZED. SHARE FORMAC/FORMAC73 IS A MAINTENANCE AND EXTENTION EFFORT AS PUBLISHED IN THE FEBRUARY 1974 ISSUE OF THE SIGSAM BULLETIN BY KNUT BAHR. THE SYSTEM IS WRITTEN IN 360 ASSEMBLER LANGUAGE AND RUNS ON 360/370 HARDWARE UNDER OS OR VS/370. MEANINGFUL PROGRAMS CAN BE RUN IN A 140 BYTE REGION.

PROGRAMMING LANGUAGE - ASSEMBLER, PL/I (F)

MINIMUM SYSTEM REQUIREMENTS - 360 MODEL 50, 140K BYTES CORE, PL/I (F)

DOCUMENTATION: 80 PAGES, \$3.00 ADDITIONAL CHARGE  
FORMAC USER'S MANUAL - \$9.50 (SEE NOTE)  
NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 7/75

NOTE: THE ABOVE DOCUMENTATION CHARGE DOES NOT INCLUDE THE FORMAC USER'S MANUAL; THIS MANUAL IS UNCHANGED FROM PREVIOUS VERSIONS OF SHARE-FORMAC.

CONTINUED FROM PRIOR COLUMN

HOWEVER, INSTALLATIONS THAT ARE ORDERING FORMAC FOR THE FIRST TIME OR FOR SOME REASON NO LONGER HAVE A COPY, WILL PROBABLY WISH TO ORDER THIS MANUAL. THE COST IS \$9.50 (THIS IS IN ADDITION TO THE DOCUMENTATION CHARGE QUOTED PREVIOUSLY).

370D-03.3.014

APL/SV (OS/MVT VERSION) MODIFICATIONS

AUTHOR: JAMES O. KITCHEN

DIRECT TECHNICAL INQUIRIES TO:

JAMES O. KITCHEN  
COMPUTATION CENTER  
UNIVERSITY OF NORTH CAROLINA  
CHAPEL HILL, NC 27514

DESCRIPTION - THIS PACKAGE CONSISTS OF MODIFICATIONS WHICH WERE APPLIED TO VERSION 1, MOD LEVEL 1, OF APL/SV TO PERMIT IT TO RUN UNDER MVT ON AN IBM 370/165 MACHINE LOCATED AT TRIANGLE UNIVERSITIES COMPUTATION CENTER (TUCC). IN ADDITION, THESE MODS PERMITTED APL/SV TO BE RUN ON THIS MACHINE CONCURRENTLY WITH APL/360. WHILE THESE MODS SHOULD ALLOW APL/SV TO BE RUN ON OTHER 370 MVT SYSTEMS, THEY ARE NOT CONSIDERED SUFFICIENT TO PERMIT IT TO BE RUN ON A 360 MACHINE OR UNDER AN MFT SYSTEM.

NOTE: THIS PACKAGE DOES NOT INCLUDE APL/SV, WHICH MUST BE LEASED FROM THE IBM CORPORATION.

PROGRAMMING LANGUAGE - OS ASSEMBLER.

MINIMUM SYSTEM REQUIREMENTS - S/370, MVT, APL/SV.

DOCUMENTATION: 6 PAGES, NO ADDITIONAL CHARGE.  
NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 3/75.

CONTINUED FROM PRIOR COLUMN

370D-03.3.015

APL/SV ASCII MODIFICATIONS

AUTHOR: JAMES O. KITCHEN

DIRECT TECHNICAL INQUIRIES TO:  
 JAMES O. KITCHEN  
 COMPUTATION CENTER  
 UNIVERSITY OF NORTH CAROLINA  
 CHAPEL HILL, NC 27514

DESCRIPTION - THIS PACKAGE CONSISTS OF MODIFICATIONS THAT WERE ADDED TO VERSION 1, MOD LEVEL 1, OF APL/SV IN ORDER TO PROVIDE DIAL-UP ASCII SUPPORT FOR THREE DIFFERENT ASCII APL KEYBOARDS INCLUDING THE ONE USED ON THE TEKTRONIX 4013 TERMINAL. SEVERAL OTHER MINOR FEATURES ARE ALSO PROVIDED INCLUDING A MECHANISM THAT PERMITS AN INSTALLATION TO DEFINE AN EXECUTE FUNCTION THAT WILL EXECUTE MOST SYSTEM COMMANDS. WHILE THESE MODS WERE DEVELOPED FOR USE WITH A COPY OF APL/SV WHICH HAS BEEN PREVIOUSLY MODIFIED TO PERMIT IT TO RUN UNDER MVT (SEE 370D-03.3.014) ON AN IBM 370/165 MACHINE AT TRIANGLE UNIVERSITIES COMPUTATION CENTER (TUCC), THERE ARE NO FEATURES OF THESE ASCII MODS WHICH ARE KNOWN TO DEPEND UPON THE MVT MODS.

PROGRAMMING LANGUAGE - OS ASSEMBLER.

MINIMUM SYSTEM REQUIREMENTS - S/370, MVT, APL/SV.

DOCUMENTATION: 8 PAGES, NO ADDITIONAL CHARGE.  
 NOT AVAILABLE ON CARDS.  
 SUBMITTAL/REVISION DATE: 3/75.

360D-03.3.016

PILOT

AUTHOR: DAVE GOMBERG

DIRECT INQUIRIES TO:  
 DAVE GOMBERG  
 U76 UCSF  
 SAN FRANCISCO, CA 94143

DESCRIPTION - PILOT IS A CAI LANGUAGE DESIGNED TO BE EASILY LEARNED AND USED. THIS TSO VERSION IS IMPLEMENTED IN PL/I

FOR THE OPTIMIZING COMPILER VERSION 2.3. IT IS SUITABLE FOR MOST INTERACTIVE PROGRAMS WHOSE MAIN FUNCTION IS EXTENSIVE CONVERSATION - SUCH AS TEACHING AND TUTORING PROGRAMS. SUPPLIED ARE A COMPILER AND EXECUTION ROUTINE. THE COMPILER REQUIRES ABOUT 200K BYTES TO EXECUTE; A TRIVIAL PROGRAM CAN BE RUN IN A MINIMUM SIZE (92K) TSO REGION.

PROGRAMMING LANGUAGE - PL/I-OPTIMIZER

MINIMUM SYSTEM REQUIREMENTS - TSO

DOCUMENTATION: 4 PAGES, NO ADDITIONAL CHARGE.  
 CARD COUNT: 3,200 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 03/76

360D-03.4.027

FORTRAN RANDOM I/O SUBROUTINE

AUTHOR: H. P. SIEGLAFF

DIRECT TECHNICAL INQUIRIES TO:  
 H. P. SIEGLAFF  
 3610 W. NORTHVIEW  
 PHOENIX, ARIZONA 85021

DESCRIPTION - THIS SUBROUTINE PROVIDES A MEANS TO THE FORTRAN PROGRAMMER TO WRITE, READ, AND FIND LOGICAL RECORDS IN RANDOM ORDER ON/FROM ANY COMBINATION OF THE 99 FORTRAN I/O UNITS.

PROGRAMMING SYSTEMS - THIS SUBROUTINE WAS WRITTEN AND TESTED USING OS FORTRAN 4 G LEVEL, OS VERSION 13 ON A S/360 MODEL 50, AND A 2311 DISK PACK.

MINIMUM SYSTEM REQUIREMENTS - THE PACKAGE SHOULD WORK ON ANY S/360 MACHINE WHICH HAS FORTRAN IV G AND OS. (MAXIMUM CORE REQUIREMENTS IS 1K.)

DOCUMENTATION: 18 PAGES, NO ADDITIONAL CHARGE.  
 CARD COUNT: 200 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 12/68

360D-03.4.033

## A 2250 MODEL 1 SIMULATION SUPPORT PACKAGE

AUTHOR: G.M. STABLER

DIRECT TECHNICAL INQUIRIES TO:  
 G.M. STABLER  
 BOX F  
 BROWN UNIVERSITY  
 PROVIDENCE, R.I. 02912

DESCRIPTION - THE 2250 MODEL 1 SIMULATION SUPPORT PACKAGE IS A SET OF 360 AND 1130 PROGRAMS WHICH ALLOW GRAPHICS PROGRAMS WRITTEN FOR THE 2250 MOD 1 OR MOD 3 GRAPHICS DISPLAY TERMINAL TO USE THE FACILITIES OF AN 1130/2250 MOD 4 TERMINAL WITH NO REPROGRAMMING. THE PACKAGE SUPPORTS ASSEMBLY LANGUAGE GRAPHICS (GPS) AS WELL AS HIGHER LEVEL LANGUAGES (GSP, GPAK), AND OPERATES AT THE ACCESS METHOD LEVEL.

PROGRAMMING SYSTEMS - WRITTEN IN ASSEMBLY LANGUAGE AND RUNS UNDER MVT AND (IN THE 1130) UNDER THE DISK MONITOR. THE 360 SYSTEM MUST INCLUDE GRAPHIC PROGRAMMING SERVICES. COMMUNICATIONS BETWEEN THE 360 AND THE 1130 SUBSYSTEM ARE CARRIED OUT OVER A HIGH SPEED (40.8K BAUD) POINT-TO-POINT LINE USING A HIGH SPEED BISYNCHRONOUS COMMUNICATIONS ACCESS METHOD (BSCAM) WHICH IS AVAILABLE FROM THE TYPE IV LIBRARY (PROGRAM NUMBERS 360D-06.3.012 AND 1130-06.3.005).

MINIMUM SYSTEM REQUIREMENTS - A 2250 MODEL 4 TERMINAL AND THOSE REQUIRED TO RUN OS/360 MVT.

DOCUMENTATION: 18 PAGES, NO ADDITIONAL CHARGE.  
 CARD COUNT: 8,570 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 10/69

360D-03.5.005

## A SYSTEM TO PROCESS ABSTRACT CATALOGS AND RELATED INDICES

AUTHOR: C. A. MERRITT

DIRECT TECHNICAL INQUIRIES TO:  
 JOHN C. MORETTI  
 IBM DPD HEADQUARTERS  
 1133 WESTCHESTER AVENUE  
 WHITE PLAINS, NEW YORK 10604

DESCRIPTION - A SYSTEM TO PROCESS ABSTRACT CATALOGS AND RELATED INDICES IS A PROGRAM WHICH IS A PART OF INFORMATION DISSEMINATION AND RETRIEVAL ACTIVITIES. THE SYSTEM WILL PRODUCE MASTER ABSTRACT CATALOGS AND INDICES COVERING ALL INFORMATION SOURCES PUBLICATIONS, PROGRAMS, AUDIO-VISUAL AIDS, SEMINARS, ETC.. THE SAME DATA FILES FROM WHICH THESE MASTER REFERENCES ARE PRODUCED WILL ALSO SERVE AS THE SOURCE OF INFORMATION FOR PREPARING SELECTIVE CATALOGS, INDICES AND BIBLIOGRAPHIES OF INTEREST TO USERS OF IBM SYSTEMS.

THE PURPOSE OF THIS DOCUMENT IS TO DESCRIBE THAT PART OF THE SYSTEM WHICH IS USED IN THE PREPARATION OF PROGRAM CATALOGS AND THEIR RELATED INDICES. THE PROGRAMS INVOLVED ARE DESIGNED TO ACCEPT INPUT TO DATA FILES, TO PROCESS CHANGE TRANSACTIONS AFFECTING DATA IN THE FILES, TO EXTRACT DATA FROM THE FILES ACCORDING TO SPECIFIED KEYS, AND TO PRINT FORMATTED INDICES AND ABSTRACT LISTINGS. FROM DATA STORED IN THE SYSTEM, THE CATALOG PROCESSOR WILL PRODUCE A CATALOG AND A VARIETY OF INDICES. IN DEVELOPING THE PROGRAM, EVERY EFFORT WAS MADE TO ALLOW AS MUCH FLEXIBILITY AS POSSIBLE IN ARRANGING DATA AND FORMATTING PRINT-OUTS. PROVISIONS ARE MADE TO SELECT PARTICULAR SETS OF RECORDS FROM THE TOTAL FILE, AND TO SEGMENT THE VARIOUS LISTINGS AND INDICES ACCORDING TO TYPES OF PROGRAM OR OTHER CONTROLS. FORMATS OF LISTINGS AS TO LINE LENGTH, SPACING, HEADINGS, ETC., CAN GENERALLY BE SPECIFIED BY THE USER THROUGH CONTROL CARDS ENTERED AT THE TIME OF EXECUTION OF A PARTICULAR PROGRAM. A GENERALIZED OVERVIEW OF THE SYSTEM SHOWS TWO BASIC OPERATING PHASES: THE FIRST UPDATES AND MAINTAINS THE FILE, THE SECOND IS THE TEXT WRITING PHASE.

EACH PHASE CONSISTS OF SEVERAL PROGRAMS WHICH MANIPULATE THE INFORMATION STORED IN THE INTEGRAL DATA BASE. THE WORD INTEGRAL IS USED TO EMPHASIZE THE FACT THAT IT IS A SINGLE DATA BASE, EVEN THOUGH IT IS SEGMENTED INTO FOUR MAJOR CATEGORIES AND MAY PHYSICALLY RESIDE IN ONE OR MORE VOLUMES OR DATA SETS. THE FOUR CATEGORIES ARE AS FOLLOWS (A)

CONTINUED FROM PRIOR COLUMN

TEMPORARY ABSTRACT LIBRARY (B) PERMANENT ABSTRACT LIBRARY  
(C) MESSAGE CENTERS (D) AUXILIARY MODULE INFORMATION  
CENTER (AMIC). OTHER SECTIONS OF THIS TEXT SHALL BE DEVOTED  
TO A DETAILED DISCUSSION OF THE SYSTEM FLOW AND THE DATA  
BASE.

PROGRAMMING SYSTEMS - THE CATALOG PROCESSOR IS PROGRAMMED  
FOR THE IBM SYSTEM/360 AND WAS TESTED AND INSTALLED UNDER  
OPERATING SYSTEM RELEASE 15/16. ALL PROGRAMS ARE WRITTEN IN  
PL/I, VERSION IV.

MINIMUM SYSTEM REQUIREMENTS - USES THE QUEUED INDEX  
SEQUENTIAL ACCESS METHOD (QISAM) WHEN ACCESSING DATA ON  
DIRECT STORAGE DEVICES. THE LARGEST PROGRAM REQUIRES A  
PARTITION OF 140K FOR EXECUTION.

DOCUMENTATION: 209 PAGES, \$9.45 ADDITIONAL CHARGE.  
CARD COUNT: 6,260 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 12/69

360D-03.5.007

REPORT WRITER

AUTHOR: R. KARPINSKI

DIRECT TECHNICAL INQUIRIES TO:  
R. H. KARPINSKI  
INFORMATION SYSTEMS, 76-U  
UNIVERSITY OF CALIFORNIA  
SAN FRANCISCO, CA 94143

DESCRIPTION - THIS PACKAGE PROVIDES A REPORT WRITER FACILITY  
IN PL/I, SIMILAR TO THAT IN COBOL. THE PACKAGE USES PL/I  
COMPILE TIME FACILITIES TO TRANSLATE THE SPECIAL  
CONSTRUCTIONS INTO GOTOS, CALLS, LABELS, AND PROCEDURES.  
NORMAL USE INVOLVES TWO % INCLUDE STATEMENTS REFERRING  
TO AN ON-LINE LIBRARY CONTAINING THE TWO SECTIONS OF CODE,  
LABELED REP1 AND REP2.

PROGRAMMING SYSTEMS - WRITTEN IN PL/I.

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED TO RUN UNDER  
OS/360.

DOCUMENTATION: 8 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 750 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 12/69

360D-03.5.008

NSCRIPT - PRODUCES TEXT DATASETS IN MANUSCRIPT FORM

AUTHOR: WILLIAM DWYER, YALE UNIVERSITY

DIRECT TECHNICAL INQUIRIES TO:

ROGER A. ROACH  
MANAGER OF SYSTEMS PROGRAMMING  
MIT, ROOM 39-564  
77 MASSACHUSETTS AVENUE  
CAMBRIDGE, MASS. 02139

DESCRIPTION - THE QUALITY AND ACCURACY OF A DOCUMENT DEPENDS  
GREATLY ON THE EASE WITH WHICH REVISIONS CAN BE MADE TO THE  
DOCUMENT. THIS STATEMENT IS PARTICULARLY TRUE OF TECHNICAL  
DOCUMENTATION (INTO WHICH CLASS THE PRESENT MANUAL FALLS),  
WHICH SHOULD ALWAYS ACCURATELY REFLECT THE STATUS OF THE  
THINGS THEY DESCRIBE.

IT IS NATURAL, PARTICULARLY AT MIT, THAT COMPUTER SOFTWARE  
SOLUTIONS TO THE PROBLEMS OF DOCUMENT PRODUCTION SHOULD BE  
DEvised. CTSS'S "RUNOFF", MULTICS'S "RUNOFF", CMS'S  
"SCRIPT" REPRESENT SIMILAR SUCH SOLUTIONS.

"NSCRIPT" IS AN OUTGROWTH OF SCRIPT INTENDED FOR USE UNDER  
CMS ON A SYSTEM/360 MODEL 67 RUNNING UNDER CP/67. IT'S SET  
OF COMMAND WORDS ENCOMPASSES MOST OF THOSE BELONGING TO  
SCRIPT, MULTICS'S "RUNOFF", AND TSO'S FORMAT. IN MOST CASES  
THEY PERFORM IDENTICAL FUNCTIONS AND HAVE THE SAME SYMBOLIC  
NOTATION.

NSCRIPT RUNNING UNDER 360/OS/TSO, WHICH WAS DEVELOPED BY THE  
MIT PROGRAMMING DEVELOPMENT OFFICE, HAS THE SAME OUTWARD  
APPEARANCE AS IT DID WHEN RUNNING UNDER CMS. EXCEPT FOR THE  
FACT THAT OS I/O CONVENTIONS MAKE IT SOMEWHAT MORE DIFFICULT  
TO USE, IT STILL HAS ALL THE CAPABILITIES THAT IT HAD WITH  
CMS.

SEVERAL POWERFUL FEATURES ARE AVAILABLE WITH NSCRIPT THAT  
ARE NOT AVAILABLE WITH TSO'S FORMAT:

- 1- THE ABILITY TO ENTER FOOTNOTES AT CONVENIENT PLACES IN  
THE INPUT. FOOTNOTES ARE SAVED AND PRINTED AT THE  
BOTTOMS OF OUTPUT PAGES.
- 2- THE ABILITY TO USE SYMBOLIC "REFERENCE NAMES" TO  
SIMPLIFY NUMBERING AND CROSS-REFERENCING.
- 3- THE ABILITY TO DEFINE BOTH HEADING AND FOOTING LINES FOR

CONTINUED FROM PRIOR COLUMN

BOTH EVEN AND ODD NUMBERED PAGES.

- 4- THE ABILITY TO SPECIFY FORMAT CONTROL INFORMATION OR TEXT DYNAMICALLY (DURING PRINTOUT).
- 5- THE ABILITY TO USE ROMAN NUMERALS (INSTEAD OF ARABIC) IN PAGE NUMBERS AND, IN CONJUNCTION WITH THE HEADING AND FOOTING CONTROLS, TO PLACE PAGE NUMBERS IN A VARIETY OF PLACES ON THE OUTPUT PAGE.
- 6- THE ABILITY TO SPECIFY TRANSLATION TABLE PAIRS.
- 7- THE ABILITY TO DEFINE "REMOTE SEQUENCES", WHICH ARE INVOKED AT SPECIFIED PLACES IN THE OUTPUT.
- 8- THE ABILITY TO CONTROL THE OUTPUT CONDITIONALLY.

NSCRIPT CONSISTS OF 2 MODULES, A COMMAND PROCESSOR (PROMPTER) FOR USE WITH TSO, AND A PROGRAM FOR PROCESSING NSCRIPT FILES WHICH CAN BE INVOKED EITHER BY THE TSO PROMPTER OR BY A BATCH JOB.

SINCE NSCRIPT CAN TREAT TAB CHARACTERS INTERNALLY, SEVERAL (OPTIONAL) MODIFICATIONS TO THE TSO EDITOR FOR TAB PROCESSING ARE INCLUDED. THE MODIFICATIONS INCLUDE THE ADDITION OF A SCRIPT FILE TYPE WHICH IS SIMILAR TO A TEXT FILE TYPE EXCEPT FOR LINE LENGTH AND TAB PROCESSING.

PROGRAMMING LANGUAGE - ASSEMBLER.

MINIMUM SYSTEM REQUIREMENTS - OS/360

DOCUMENTATION: 111 PAGES, \$4.55 ADDITIONAL CHARGE.  
CARD COUNT: 10,600 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 1/74.

360D-03.5.009  
PL/I REPORT WRITER MACROS

AUTHOR: D. KARPINSKI  
MODIFIED BY SHARON BONNER

DIRECT TECHNICAL INQUIRIES TO:  
SHARON BONNER  
MARATHON OIL COMPANY  
FINDLAY, OHIO 45840

DESCRIPTION - THIS IS A MODIFICATION OF SHARE PROGRAM 360D-03.5.007 FOR USE WITH THE PL/I OPTIMIZING COMPILER. SEE THE ABSTRACT FOR THE ABOVE PROGRAM FOR DETAILS.

PROGRAMMING LANGUAGE - IBM PL/I OPTIMIZING COMPILER

MINIMUM SYSTEM REQUIREMENTS - N/A

DOCUMENTATION: 24 PAGES, \$.20 ADDITIONAL CHARGE.  
CARD COUNT: 933 CARDS APPROXIMATE.  
SUBMITTAL/REVISION DATE: 4/76

360D-03.6.001  
FORTRAN CROSS REFERENCE

AUTHOR: R. H. KARPINSKI

DIRECT TECHNICAL INQUIRIES TO:  
R. H. KARPINSKI  
INFORMATION SYSTEMS, 76-U  
UNIVERSITY OF CALIFORNIA  
SAN FRANCISCO, CA 94143

DESCRIPTION - FORTXREF IS A STANDARD PL/I PROGRAM USING SYSIN FOR THE INPUT DATA AND SYSPRINT FOR THE OUTPUT. THE DATA CONSISTS OF ONE OR MORE FORTRAN PROGRAMS. EACH OCCURRENCE OF A FORTRAN END CARD WILL CAUSE THE CROSS-REFERENCING TABLE TO BE OUTPUT AND REINITIALIZED. THIS WILL ALSO HAPPEN ON END OF DATA IF THE LAST CARD IS NOT AN END CARD. EACH INPUT CARD WILL BE OUTPUT WITH A FORTRAN LINE NUMBER IF APPROPRIATE. THE CROSS-REFERENCE TABLE GIVES (IN 360 COLLATING SEQUENCE) EACH KEYWORD, VARIABLE NAME, STATEMENT NUMBER, AND CONSTANT WITH A LIST OF EACH USE BY LINE NUMBER. INACCURACIES- IF "FORMAT" IS USED

CONTINUED FROM PRIOR COLUMN

AS AN ARRAY NAME, THE REST OF THE STATEMENT MAY NOT BE CROSS REFERENCED. LIMITS- 2000 ITEMS MAY BE REFERENCED APPROXIMATELY 6000 TIMES.

PROGRAMMING SYSTEMS - WRITTEN IN PL/I.

MINIMUM SYSTEM REQUIREMENTS - S/360 MODEL 40.

DOCUMENTATION: 5 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 300 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 02/67

360D-03.6.007

COBOL SOURCE CROSS-REFERENCE LISTING

AUTHOR: D. E. OLDHAM

DIRECT TECHNICAL INQUIRIES TO:

BRUCE LEAKE  
BELL HELICOPTER CO.  
DEPARTMENT 17  
P.O. BOX 482  
FORT WORTH, TEXAS 76101

DESCRIPTION - THE OBJECTIVE OF THIS PROGRAM IS TO PRODUCE A CROSS-REFERENCE LISTING OF DATA-NAMES, PROCEDURE-NAMES, AND PARAGRAPH-NAMES FROM COBOL SOURCE STATEMENTS, USING THE STATEMENT SEQUENCE NUMBER AS THE REFERENCE NUMBER.

PROGRAMMING SYSTEMS - WRITTEN IN COBOL.

MINIMUM SYSTEM REQUIREMENTS - THE COBOL-F SORT VERB IS UTILIZED BY THE PROGRAM AND REQUIRES THREE (3) SORT WORK UNITS (TAPE OR DISK).

DOCUMENTATION: 18 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 1,150 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 01/68

360D-03.6.018

NEATER: A PL/I SOURCE STATEMENT REFORMATTER

AUTHORS: K. CONROW R.G. SMITH

DIRECT TECHNICAL INQUIRIES TO:

KENNETH CONROW  
COMPUTING CENTER  
KANSAS STATE UNIVERSITY  
MANHATTAN, KANSAS 66502

DESCRIPTION - THE PROGRAM (NEATER) ACCEPTS A SYNTACTICALLY CORRECT PL/I PROGRAM AND OPERATES ON IT TO PRODUCE A REFORMATTED VERSION. IT EITHER PRINTS OR PRINTS AND PUNCHES THE REFORMATTED PROGRAM IN A LOGICAL OR IN A COMPRESSED FORMAT. IT NEATENS THE STATEMENTS BY OMITTING NONESSENTIAL STRINGS OF BLANKS. LOGICAL STRUCTURE IS INDICATED BY INDENTATION; THE AMOUNT OF INDENTATION FOR EACH LOGICAL LEVEL IS CONTROLLED BY THE USER. STATEMENT NUMBERS ARE PRODUCED WHICH CORRESPOND TO THOSE PRODUCED BY THE COMPILER. THE PROGRAM IS EXTREMELY USEFUL IN DEVELOPMENT OF COMPLICATED PL/I SOURCE PROGRAMS BECAUSE AN UNEXPECTED INDENTATION PATTERN WILL AT ONCE REVEAL LOGIC ERRORS. LOGICALLY FORMATTED VERSIONS OF COMPLICATED SOURCE PROGRAMS ARE FAR MORE VALUABLE IN DOCUMENTATION OF SUCH PROGRAMS THAN AN UNFORMATTED SOURCE LISTING.

PROGRAMMING SYSTEMS - NEATER IS WRITTEN IN PL/I, IT OPERATES SUCCESSFULLY ON ITSELF, THE SUBMITTED DECK IS IN COMPRESSED FORMAT, THE SUBMITTED LISTING IS IN LOGICAL FORMAT WITH THE DEFAULT INDENTATION OF 3 AND SERVES AS AN EXAMPLE OF NEATER'S OUTPUT. NEATER HAS BEEN COMPILED AND TESTED USING OS VERSION 17 ON A S360 MODEL 50.

MINIMUM SYSTEM REQUIREMENTS - 360 USING FULL PL/I. CARD READER, PRINTER, A 2311 DISK COULD BE USED WITH "HASP" IF DESIRED.

DOCUMENTATION: 16 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 200 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 06/69



CONTINUED FROM PRIOR COLUMN

360D-03.6.019

SIMPLE: A SIMPLE PRECEDENCE TRANSLATOR WRITING SYSTEM

AUTHOR: JAMES E. GEORGE

DIRECT TECHNICAL INQUIRIES TO:

DR. JAMES E. GEORGE  
 LOS ALAMOS SCIENTIFIC LABORATORY  
 P.O. BOX 1663, MS 272  
 LOS ALAMOS, NEW MEXICO 87545

DESCRIPTION - SIMPLE IS A TRANSLATOR WRITING SYSTEM COMPOSED OF A SIMPLE PRECEDENCE SYNTAX ANALYZER AND A SEMANTIC CONSTRUCTOR AND IS IMPLEMENTED IN PL/I. IT PROVIDES AN ERROR DIAGNOSTIC AND RECOVERY MECHANISM FOR ANY SYSTEM IMPLEMENTED USING SIMPLE. THE REMOVAL OF PRECEDENCE CONFLICTS IS DISCUSSED IN DETAIL WITH SEVERAL EXAMPLES.

THE UTILIZATION OF SIMPLE IS ILLUSTRATED BY DEFINING A COMMAND LANGUAGE META SYSTEM FOR THE CONSTRUCTION OF SCANNERS FOR A WIDE VARIETY OF COMMAND ORIENTED LANGUAGES. THIS META SYSTEM IS ILLUSTRATED BY DEFINING COMMANDS FROM SEVERAL TEXT EDITORS.

PROGRAMMING LANGUAGE - PL/I (F LEVEL)

MINIMUM SYSTEM REQUIREMENTS - OS/360

DOCUMENTATION: 99 PAGES, \$3.95 ADDITIONAL CHARGE.  
 CARD COUNT: 1,900 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 5/73

360D-03.6.020

MORTRAN, A FORTRAN LANGUAGE EXTENSION

AUTHOR: A. JAMES COOK

DIRECT TECHNICAL INQUIRIES TO:

A. JAMES COOK  
 SLAC COMPUTATION GROUP  
 P.O. BOX 4349  
 STANFORD, CA 94305

DESCRIPTION - MORTRAN IS A FORTRAN LANGUAGE EXTENSION. ITS FEATURES INCLUDE (1) FREE-FIELD FORMAT, (2) ALPHANUMERIC STATEMENT LABELS, (3) COMMENTS ALLOWED ANYWHERE IN THE TEXT,

(4) MULTIPLE ASSIGNMENT STATEMENTS, (5) SIMPLE BLOCK STRUCTURE, (6) IMPLIED LOOPING CONTROL STATEMENTS, (7) FOR-BY-TO, WHILE, UNTIL, IF-THEN-ELSE, UNLESS-ELSE STATEMENTS, (8) ABBREVIATIONS FOR SOME COMMON FORTRAN CONSTRUCTIONS, AND (10) USER-DEFINED MACRO-INSTRUCTIONS.

THE FORTRAN PROCESSOR IS WRITTEN IN STANDARD FORTRAN IV SO THAT IT CAN BE IMPLEMENTED ON ANY COMPUTER THAT HAS A STANDARD FORTRAN COMPILER.

PROGRAMMING LANGUAGE - FORTRAN IV

MINIMUM SYSTEM REQUIREMENTS - OS/360 + FORTRAN IV

DOCUMENTATION: 3 PAGES, NO ADDITIONAL CHARGE.

(PLUS MACHINE READABLE DOCUMENTATION)

CARD COUNT: NOT AVAILABLE ON CARDS.

SUBMITTAL/REVISION DATE: 8/73.

360D-03.6.022

DECTALB, A DECISION TABLE TRANSLATOR BASED ON LIST PROCESSING TECHNIQUES

AUTHOR: KENNETH CONROW (WITH RONALD G. SMITH)

DIRECT TECHNICAL INQUIRIES TO:

KENNETH CONROW  
 COMPUTING CENTER  
 KANSAS STATE UNIVERSITY  
 MANHATTAN, KANSAS 66502

DESCRIPTION - DECTALB, A DECISION TABLE ALGORITHM BASED ON LIST PROCESSING TECHNIQUES, IS A TRANSLATOR WHICH CONVERTS PROGRAMS OR PROGRAM SEGMENTS WRITTEN IN DECISION TABLES INTO COMPILABLE PL/I CODING. THE USE OF A DIRECTORY VECTOR TO CONTROL EXECUTION ENABLES COMPLETE ELIMINATION OF DUPLICATE CODING OF STUBS, COMPLETE FREEDOM OF REUSE OF STUBS THROUGHOUT A DECTALB BLOCK, AND AUTOMATIC REARRANGEMENT OF CONDITION STUBS TO REDUCE THE OVERHEAD OF RULE SELECTION. THE EXECUTION TIME CONTROL SECTION IS SO SIMPLE THAT IT ADDS VERY LITTLE OVERHEAD AT EXECUTION TIME. THE VERSION SUBMITTED IS THE BOOTSTRAP WHICH WAS EMPLOYED TO IMPLEMENT A MORE COMPLETE SYSTEM. THE BOOTSTRAP IMPLEMENTS THE BASIC FEATURES MENTIONED ABOVE BUT DOES NOT INCORPORATE ELABORATIONS LIKE PROCESSING EXTENDED ENTRY DECISION TABLES, PROVISION OF DIAGNOSTICS, AND ACCEPTANCE OF CONTROL OPTIONS.

CONTINUED FROM PRIOR COLUMN

PROGRAMMING LANGUAGE - PL/I (F)

MINIMUM SYSTEM REQUIREMENTS - OS/360 (TESTED UNDER MPT)

DOCUMENTATION: 75 PAGES, \$2.75 ADDITIONAL CHARGE.

CARD COUNT: 1,220 APPROXIMATE.

SUBMITTAL REVISION DATE: 2/74.

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360D-03.6.023

COBOL MODULE AND GO TO CHECKER

AUTHOR: HAROLD P. SIEGLAFF

DIRECT TECHNICAL INQUIRIES TO:

HAROLD P. SIEGLAFF  
3610 WEST NORTHVIEW  
PHOENIX, ARIZONA 85021

DESCRIPTION - THIS COBOL PROGRAM CHECKS A COBOL PROGRAM FOR MODULARITY AND UPWARD GO TO STATEMENTS. A MODULAR PROGRAM CONSISTS OF 1-N MODULES IN THIS FORM: BEGIN-X ... END-X. EXIT. OR STOP RUN. TO EXECUTE CODE OUTSIDE OF A MODULE USE PERFORM ... THRU ... OR CALL SUBR. AMONG 9 DETECTED ERRORS ARE ALTER, GO TO ... DEPENDING ON, PERFORM WITHOUT THRU, AND GO TO A PARAGRAPH OUTSIDE A MODULE. UPWARD GO TO STATEMENTS ARE PRINTED WITH A WARNING. THIS COBOL PROGRAM IS MODULAR AND MAY BE USED AS INPUT FOR A SAMELE RUN. THIS PROGRAM MAY BE RUN ON ANY COMPUTER WITH A COBOL COMPILER, CARD READER, AND PRINTER. ADDITIONAL DOCUMENTATION AND JCL NEEDED TO RUN THE PROGRAM ARE INCLUDED WITH THE PROGRAM AS COMMENTS.

THIS PROGRAM PROGRAM IS THE FIRST PROGRAM OF A TRILOGY.

IDEA 59 COBOL MODULE AND GO TO CHECKER

IDEA 60 COBOL MODULE INDEXER AND LOOP CHECKER

IDEA 61 COBOL MODULE SEGMENTER

A MODULAR PROGRAM CAN DECREASE DEBUGGING, SIMPLIFY MAINTENANCE, AND FORCE PROGRAMS TO BE WRITTEN IN FUNCTIONAL MODULES, (E.G. READ/WRITE A RECORD, CREATE/UPDATE A MESSAGE, SEARCH/SORT A TABLE, ETC.)

PROGRAMMING LANGUAGE - COBOL

MINIMUM SYSTEM REQUIREMENTS - COBOL COMPILER.

CONTINUED FROM PRIOR COLUMN

DOCUMENTATION: 2 PAGES, NO ADDITIONAL CHARGE.  
(PLUS SOURCE CCDE COMMENTS)

CARD COUNT: 650 CARDS.

SUBMITTAL/REVISION DATE: 10/74.

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360D-03.6.024

COBOL MODULE INDEXER AND LOOP CHECKER

AUTHOR: HAROLD P. SIEGLAFF

DIRECT TECHNICAL INQUIRIES TO:

HAROLD P. SIEGLAFF  
3610 WEST NORTHVIEW  
PHOENIX, ARIZONA 85021

DESCRIPTION - THIS COBOL PROGRAM CREATES AN N LEVEL INDEX OF A MODULAR COBOL PROGRAM. THE INDEX IS THE STRUCTURE OF THE PROGRAM. ENDLESS PERFORM LOOPS ARE DETECTED. THE COBOL PROGRAM MUST SATISFY THE DEFINITION OF MODULARITY GIVEN IN COBOL MODULE AND GO TO CHECKER, 360D-03.6.023. THIS PROGRAM IS MODULAR AND MAY BE USED AS INPUT FOR A TEST RUN. THIS PROGRAM SHOULD RUN ON ANY COMPUTER WITH A COBOL COMPILER, CARD READER, AND PRINTER. ADDITIONAL DOCUMENTATION AND JCL NEEDED TO RUN THE PROGRAM ARE INCLUDED WITH THE PROGRAM AS COMMENTS. RESTRICTIONS ARE 99 MODULES PER PROGRAM, 50 PERFORM STATEMENTS PER MODULE, 20 LEVELS OF MODULES (20 ACTIVE PERFORM STATEMENTS (ONE WHOSE THRU PARAGRAPH HAS NOT BEEN EXECUTED)).

THIS PROGRAM IS THE SECOND PROGRAM OF A TRILOGY:

IDEA 59 COBOL MODULE AND GO TO CHECKER

IDEA 60 COBOL MODULE INDEXER AND LOOP CHECKER

IDEA 61 COBOL MODULE SEGMENTER

PROGRAMMING LANGUAGE - COBOL

MINIMUM SYSTEM REQUIREMENTS - COBOL (TESTED ON 370/158).

DOCUMENTATION: 2 PAGES, NO ADDITIONAL CHARGE.  
(PLUS SOURCE CODE COMMENTS)

CARD COUNT: 750 APPROXIMATE.

SUBMITTAL/REVISION DATE: 12/74.

360D-03.6.025

MAP/II MACRO PRE-PROCESSOR

AUTHOR: NORM CASSELMAN

DIRECT TECHNICAL INQUIRIES TO:

NORM CASSELMAN  
DEPARTMENT 522  
THE MAGNAVOX COMPANY  
4624 EXECUTIVE BLVD.  
FORT WAYNE, INDIANA 46808

DESCRIPTION - MAP II IS A MACRO-DRIVEN PRE-PROCESSOR USED TO PROCESS INPUT DATA SETS CONSISTING OF 80 BYTE LOGICAL RECORDS UNDER CONTROL OF USER-SUPPLIED MACRO ROUTINES. THESE MACRO ROUTINES MAY BE PROVIDED WITH THE SOURCE INPUT OR STORED IN A STANDARD OS PDS IN SOURCE FORM. ALTHOUGH MAP/II MAY BE USED IN A NUMBER OF DIFFERENT APPLICATIONS, IT IS SPECIFICALLY DESIGNED TO PRE-PROCESS FORTRAN SOURCE PROGRAMS. THE MACRO ROUTINES THEMSELVES ARE WRITTEN IN A MODIFIED FORTRAN LANGUAGE AND ARE INTERPRETIVELY EXECUTED BY MAP/II. ALL MACRO ROUTINES HAVE DECISION-MAKING INSTRUCTIONS AND BRANCHING CAPABILITY.

MAP/II ONLY RECOGNIZES MACRO COMMANDS FROM THE SOURCE INPUT - ALL OTHER RECORDS ARE IGNORED AND DIRECTLY PASSED TO AN OUTPUT DATA SET. WHEN MACRO COMMANDS ARE DETECTED, CONTROL IS TRANSFERRED TO THE APPROPRIATE MACRO ROUTINE WHICH GENERATES THE DESIRED EXPANDED RECORDS.

PROGRAMMING LANGUAGE - OS ASSEMBLER (F)

MINIMUM SYSTEM REQUIREMENTS - OS/360

DOCUMENTATION: 7 PAGES, NO ADDITIONAL CHARGE.  
(PLUS MACHINE READABLE DOCUMENTATION)  
CARD COUNT: 9000 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 5/75

360D-03.6.026

MORTRAN2, A PORTABLE MACRO-BASED STRUCTURED FORTRAN EXTENSION

AUTHOR: A.J. COOK AND L.J. SHUSTEK

DIRECT TECHNICAL INQUIRIES TO:

A.J. COOK OR L.J. SHUSTEK  
SLAC COMPUTATION RESEARCH GROUP 88  
P.O. BOX 4349  
STANFORD, CA 94305

DESCRIPTION - MORTRAN2 IS A FORTRAN LANGUAGE EXTENSION THAT PERMITS A RELATIVELY EASY TRANSITION FROM FORTRAN TO A MORE CONVENIENT AND STRUCTURED LANGUAGE. THE LANGUAGE IS IMPLEMENTED BY A MACRO-BASED PRE-PROCESSOR AND IS FURTHER EXTENSIBLE BY USER-DEFINED MACROS. ITS FEATURES INCLUDE (1) FREE-FIELD FORMAT, (2) ALPHANUMERIC STATEMENT LABELS, (3) FLEXIBLE COMMENT CONVENTION, (4) NESTED BLOCK STRUCTURE, (5) FOR-BY-TO, DO, WHILE, UNTIL, LOOP, IF-THEN-ELSEIF-ELSE, EXIT AND NEXT STATEMENTS, (6) MULTIPLE ASSIGNMENT STATEMENTS, (7) CONDITIONAL COMPILATION, AND (8) AUTOMATIC LISTING INDENTATION.

THE MORTRAN2 PRE-PROCESSOR IS WRITTEN IN ANSI STANDARD FORTRAN, AND THE OUTPUT IS ALSO FORTRAN SO THAT TRANSPORTABILITY OF BOTH THE PRE-PROCESSOR AND ITS GENERATED PROGRAMS IS ASSURED. MORTRAN2 IS AN EXTENSION OF THE PROCESSOR (AND LANGUAGE) CALLED MORTRAN.

PROGRAMMING LANGUAGE - FORTRAN IV

MINIMUM SYSTEM REQUIREMENTS - ANSI STANDARD FORTRAN IV SYSTEM

DOCUMENTATION: 37 PAGES, \$.85 ADDITIONAL CHARGE.  
CARD COUNT: 6,000 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 7/75.

CONTINUED FROM PRIOR COLUMN

360D-03.6.027

TIME SHARING LANGUAGE/ONE (TL/1)

AUTHORS: ALFRED S. BAKER  
JOHN A. CHAPMAN

DIRECT TECHNICAL INQUIRIES TO:

MR. JOHN A. CHAPMAN  
STANDARD OIL CO. (INDIANA)  
200 EAST RANDOLPH DRIVE  
CHICAGO, ILLINOIS 60601

DESCRIPTION - TIME SHARING LANGUAGE/ONE IS A TSO COMMAND LANGUAGE PROCESSOR LANGUAGE BASED AROUND PL/1. IT CAN BE USED FOR HIGHLY SPECIALIZED INTERACTIVE APPLICATIONS. WHEN USED AS A CLIST REPLACEMENT - IT PROVIDES THE USER WITH ALL OF THE LOGICAL POWER AVAILABLE TO THE PL/1 PROGRAMMER. TIME SHARING LANGUAGE/ONE IS DISTRIBUTED AS PL/1 PREPROCESSOR MACROS, PL/1 SUBPROGRAMS, ASSEMBLY LANGUAGE SUBPROGRAMS, AND SAMPLE COMMANDS.

PROGRAMMING LANGUAGE - ASSEMBLER &amp; PL/1 (OPTIMIZER/F)

MINIMUM SYSTEM REQUIREMENTS - OS RELEASE 21

DOCUMENTATION: 98 PAGES, \$3.90 ADDITIONAL CHARGE.  
CARD COUNT: 46,000 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 4/76

360D-03.7.034

MACRO CROSS-REFERENCE PROGRAM

AUTHOR: EDWIN S. RUSSELL

DIRECT TECHNICAL INQUIRIES TO:

EDWIN S. RUSSELL  
SLAC COMPUTING FACILITY, BIN L  
P. O. BOX 4349  
STANFORD, CALIFORNIA 94305

DESCRIPTION - THE MACRO CROSS-REFERENCE PROGRAM (MACROREF) PROCESSES MACROS, COPY ENTRIES, AND/OR ASSEMBLY LANGUAGE SOURCE PROGRAMS AND PRODUCES A CROSS-REFERENCE LISTING OF THE USAGE OF ALL VARIABLE SET SYMBOLS, SYMBOLIC PARAMETERS, SEQUENCE SYMBOLS, AND MACRO CALLS. OPTIONALLY, IT MAY BE

USED TO CROSS-REFERENCE CALLED MACROS AND/OR ALL USAGES OF SELECTED OP-CODES. THE PROGRAM IS INTENDED FOR USE WITH MACROS WRITTEN FOR THE OS/360 LEVEL F ASSEMBLER: THE MORE PERMISSIVE SYNTAX OF THE LEVEL H ASSEMBLER IS NOT IMPLEMENTED BY THIS PROGRAM.

PROGRAMMING SYSTEMS - LANGUAGE - OS/360 ASSEMBLER LEVEL F

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED BY OS/360

DOCUMENTATION: 21 PAGES, \$.05 ADDITIONAL CHARGE.

CARD COUNT: 4,640 APPROXIMATE.

SUBMITTAL/REVISION DATE: 02/73

360D-03.8.013

PL/I STRING FUNCTIONS

AUTHOR: P. LACOUTURE

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
CURRENTLY NOT AVAILABLE.

DESCRIPTION - PL/I ALLOWS THE PROGRAMMER TO MANIPULATE CHARACTER STRING DATA WITH A GREAT DEAL OF FLEXIBILITY. THE OPERATOR, II, AND THE BUILT IN FUNCTIONS INDEX, SUBSTR, AND LENGTH PROVIDE A MEANS FOR SCANNING, PREPARING, AND PARSING TEXT. WHILE THESE FUNCTIONS ARE SUFFICIENT TO PERFORM ALMOST ANY CHARACTER STRING MANIPULATIONS THE PROGRAMMER DESIRES, THEY MUST OFTEN BE CALLED REPEATEDLY TO ACHIEVE THE DESIRED EFFECT. THE STRING FUNCTIONS DESCRIBED IN THE ENCLOSED WRITE UP ARE DERIVED FROM A SET OF OPERATORS FOR PL/I PROPOSED BY DR. ROBERT F. ROSIN. ("STRINGS IN PL/I", SIGPLAN NOTICES 'PL/I BULLETIN NO.4' VOLUME 2 NO. 8, AUG., 1967.) THEY ARE DESIGNED TO COMPLEMENT THE FACILITIES ALREADY AVAILABLE IN PL/I (F).

THEY MAY BE DIVIDED INTO THREE GROUPS FOR PURPOSES OF DISCUSSION:

1. BEFORE, UPTO, FROM, AFTER, IN, DELETE, DELETS, REPLACE, REPLS, REVERSE, AND SCOUNT--ALL OF THESE RETURN STRINGS OR VALUES AND ALL EXCEPT DELETE, REPLACE, AND REPLS SET A SUCCESS VARIABLE WHICH MAY BE TESTED (SEE BELOW).
2. FAIL AND SUC--FUNCTIONS THAT ARE THE RESULT OF THE PREVIOUS STRING FUNCTION AND RETURN '0' (FAILURE IN

CONTINUED FROM PRIOR COLUMN

THE PREVIOUS FUNCTION). PRIOR TO THE INVOCATION OF ANY STRING FUNCTION, THE SUCCESS VARIABLE HAS THE VALUE '1' (SUCCESS).

3. SETSUC--FUNCTION THAT IS USED TO SET THE SUCCESS VARIABLE TO EITHER VALUE.

PROGRAMMING SYSTEMS - THE FUNCTIONS THEMSELVES ARE WRITTEN IN PL/I (F) AND HAVE BEEN COMPILED AND TESTED USING PL/I (F) VERSION 4 ON AN OS/MFT BASED SYSTEM ON AN S/360 MODEL 50.

MINIMUM SYSTEM REQUIREMENTS - 360/30 64K.

DOCUMENTATION: 13 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 300 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 02/69

360D-03.8.016

COBFORT - AN INTERFACE ENABLING STANDARD CALLS TO FORTRAN PROGRAMS, SUBPROGRAMS, AND LIBRARY SUBPROGRAMS FROM OTHER LANGUAGES.

AUTHOR: ROGER CHETWYND

DIRECT TECHNICAL INQUIRIES TO:  
ROGER CHETWYND  
COMPUTER SCIENCE DEPARTMENT  
UNIVERSITY OF MONTANA  
MISSOULA, MONTANA 59801

DESCRIPTION - COBFORT IS AN INTERFACE SYSTEM FOR OS/360 USERS THAT ENABLES STANDARDIZATION OF CALLS TO FORTRAN PROGRAMS, SUBPROGRAMS, AND MOST LIBRARY SUBPROGRAMS, THUS MAKING THE POWERFUL NUMERICAL CAPABILITY OF FORTRAN AVAILABLE TO PROGRAMS WRITTEN IN OTHER LANGUAGES. THE INTERFACE IS DESIGNED PARTICULARLY FOR USE WITH OS ANS COBOL PROGRAMS AND THE DOCUMENTATION REFLECTS THIS BIAS BUT ITS COMPATIBILITY WITH OTHER LANGUAGES SHOULD BE WIDESPREAD.

THE DISTRIBUTED PACKAGE CONSISTS OF TWO ASSEMBLY LANGUAGE MACRO-INSTRUCTIONS WITH DOCUMENTATION AND MAY BE IMPLEMENTED SIMPLY BY ADDING THE MACROS TO A LIBRARY WITH NO FURTHER SYSTEM CHANGE. THE USER TAILORS AN INTERFACE TO HIS NEEDS BY ASSEMBLING THESE MACROS WITH PROPER PARAMETERS. THE INTERFACE IS SUBSTITUTED FOR CERTAIN MODULES IN THE FORTRAN LIBRARY, WHICH SUBSTITUTION MAY BE DONE AS LATE AS THE TIME

CONTINUED FROM PRIOR COLUMN

OF LINKEDITING THE USER'S FINAL LOAD MODULE.

FACILITIES ARE PROVIDED FOR THE RETURN OF FORTRAN FUNCTION AND LIBRARY FUNCTION EVALUATIONS AND FOR THE HANDLING OF SOME FORTRAN EXECUTION-TIME ERRORS. THE MOST IMPORTANT RESTRICTION IMPOSED IS THE PROHIBITION OF FORTRAN INPUT-OUTPUT; AS COBOL PROVIDES EXCELLENT INPUT-OUTPUT FACILITIES, THIS RESTRICTION IS NOT SERIOUS AND IT ALLOWS THE INTERFACE TO REMAIN SMALL (LESS THAN 1K FOR MOST APPLICATIONS).

COBFORT WILL RUN UNDER ANY VERSION OF OS SINCE RELEASE 18.

PROGRAMMING LANGUAGE - OS MACRO ASSEMBLER.

MINIMUM SYSTEM REQUIREMENTS - OS/360

DOCUMENTATION: 22 PAGES, \$.10 ADDITIONAL CHARGE.  
CARD COUNT: 500 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 8/74.

360D-04.0.006

CLOCK

AUTHOR: W. S. PAGE

DIRECT TECHNICAL INQUIRIES TO:  
H. R. HAMILTON  
NORTH CAROLINA STATE UNIVERSITY  
P. O. BOX 5445  
RALEIGH; N. C. 27607

DESCRIPTION - A SUBROUTINE TO DELIVER READINGS OF THE S/360 REAL TIME CLOCK TO PROGRAMS CALLING WITH A S/360 FORTRAN IV COMPATIBLE LINKAGE. TIME ELAPSED SINCE LAST CALL OF SUBROUTINE CAN ALSO BE COMPUTED BY THE SUBROUTINE. MANY SEPARATE "CLOCKS" CAN BE KEPT RUNNING WITHIN THE CALLING PROGRAM.

PROGRAMMING SYSTEMS - REQUIRES S/360 OS.

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED FOR OS/360.

DOCUMENTATION: 9 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 100 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 06/68

360D-04.0.010

SIMPLIFIED INPUT - OUTPUT AND DEBUGGING MACROS FOR  
ASSEMBLER LANGUAGE USERS

AUTHOR: JOHN R. EHRMAN

DIRECT TECHNICAL INQUIRIES TO:

DR. JOHN R. EHRMAN  
STANFORD CENTER FOR INFORMATION PROCESSING  
SLAC - BIN 97  
POST OFFICE BOX 4349  
STANFORD, CALIFORNIA 94305DESCRIPTION - THIS SET OF FIVE MACRO-INSTRUCTIONS AND FOUR  
ASSOCIATED LIBRARY ROUTINES PROVIDE THE ASSEMBLER LANGUAGE  
PROGRAMMER WITH AN EXTREMELY SIMPLE AND USEFUL SET OF  
INPUT-OUTPUT AND DIAGNOSTIC TOOLS.(1) THE PRINTOUT MACRO PRINTS THE CONTENTS OF MEMORY AREAS  
IN A FORMAT DETERMINED BY THE TYPE OF DATA IT CONTAINS.  
(2) THE PRINTLIN MACRO PRINTS SINGLE LINE IMAGES. (3) THE  
READCARD MACRO READS INPUT DATA CARDS. (4) THE PROLOGUE  
AND EPILOGUE MACROS SET UP AN ERROR-HANDLING LINKAGE THAT  
ALLOWS A PROGRAM TO CONTINUE AFTER PROGRAM INTERRUPTIONS,  
AND PROVIDE PSW, REGISTER, AND CORE DUMPS. THE INTERFACE  
ROUTINES CALLED BY THE MACROS USE THE FORTRAN I/O LIBRARY  
TO DO THE ACTUAL INPUT AND OUTPUT, AND DATA FORMATTING.PROGRAMMING SYSTEMS - WRITTEN IN ASSEMBLER LANGUAGE F,  
OPERATES UNDER OS/360.MINIMUM SYSTEM REQUIREMENTS - SAME AS THOSE REQUIRED FOR  
OS/360.DOCUMENTATION: 18 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 1,200 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 09/69

360D-04.0.011

MACROS FOR SIMPLIFIED I/O AND DIAGNOSTIC PRINTOUTS

AUTHORS: JOHN R. EHRMAN JAMES R. LOW  
PAUL M. DANTZIG

DIRECT TECHNICAL INQUIRIES TO:

DR. JOHN R. EHRMAN  
STANFORD CENTER FOR INFORMATION PROCESSING  
SLAC - BIN 97  
P. O. BOX 4349  
STANFORD, CALIFORNIA 94305DESCRIPTION - THESE MACROS PROVIDE A VERY SIMPLE MEANS FOR  
THE BEGINNING ASSEMBLER LANGUAGE PROGRAMMER TO (1) READ  
CARD IMAGES INTO HIS PROGRAM, AND DETECT ENDFILE CONDITIONS;  
(2) WRITE PRINTER LINE IMAGES OF VARYING OR DEFAULT LENGTHS;  
(3) PRINT A FORMATTED AND NAMED LINE GIVING THE CONTENTS OF  
A SYMBOLICALLY DESCRIBED AREA OF MEMORY; (4) PRINT THE  
CONTENTS OF THE GENERAL PURPOSE AND FLOATING POINT  
REGISTERS; (5) GIVE A FORMATTED HEXADECIMAL DUMP OF  
SPECIFIED AREAS OF MEMORY; (6) CLOSE THE INPUT AND OUTPUT  
FILES AND RETURN CONTROL TO THE SUPERVISOR.THE MACROS ARE VERY EASY TO USE, ALLOW A FLEXIBLE MEANS OF  
SPECIFYING OPERANDS, AND HAVE NO ADVERSE OR UNDESIRABLE  
EFFECTS ON THE USER'S PROGRAM.DOCUMENTATION: 9 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 950 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 09/72

360D-04.1.012

FORTRAN H SYMBOLIC DEBUGGING PACKAGE

AUTHOR: JOHN STEFFANI

DIRECT TECHNICAL INQUIRIES TO:

JOHN STEFFANI  
COMPUTATION GROUP - BIN 88  
SLAC  
2575 SANDHILL ROAD  
MENLO PARK, CALIFORNIA 94025DESCRIPTION - THE FORTRAN H SYMBOLIC DEBUGGING PACKAGE  
ALLOWS THE USER TO VIEW HIS FORTRAN H PROGRAM'S VARIABLES

CONTINUED FROM PRIOR COLUMN

AND THEIR CONTENTS UPON DEMAND (VIA SUBROUTINE CALL) OR UPON PROGRAM TERMINATION, EITHER NORMAL OR ABNORMAL. THE PACKAGE CONSISTS OF A MODIFIED FORTRAN H COMPILER, A MODIFIED LINKAGE EDITOR AND AN EXECUTION TIME SUPERVISOR.

THE CURRENT DISTRIBUTION INCLUDES OBJECT CODE ONLY. THE DOCUMENTATION INCLUDES AN INSTALLATION GUIDE, A USER'S GUIDE AND AN APPENDIX WHICH CONTAINS THE ORIGINAL WORK ON THIS PROGRAM. IN ORDER TO IMPROVE THE PROGRAM, THE AUTHOR WOULD WELCOME COMMENTS AND/OR SUGGESTIONS FROM USER INSTALLATIONS.

PROGRAMMING LANGUAGE / SYSTEM - FORTRAN H, 88K LINKAGE EDITOR.

MINIMUM SYSTEM REQUIREMENTS - OS/360 MVT, 100 TRACKS OF 2314 DISK STORAGE OR EQUIVALENT.

DOCUMENTATION: 44 PAGES, \$1.20 ADDITIONAL CHARGE.  
CARD COUNT: 800 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 11/72

360D-04.2.008  
PL/I EXECUTION ANALYZER (PLEA)

AUTHOR: I. M. CUTHILL

DIRECT TECHNICAL INQUIRIES TO:

I. M. CUTHILL  
GENERAL RESOURCES, COATS 14P,  
STATISTICS CANADA  
TUNNEY'S PASTURE  
OTTAWA, ONTARIO, CANADA K1A 0T6

DESCRIPTION - PLEA, THE PL/I EXECUTION ANALYZER, IS DESIGNED TO GIVE A PL/I PROGRAMMER A STATISTICAL ANALYSIS OF WHERE CPU TIME IS BEING SPENT IN HIS PROGRAM, PLUS A LISTING OF ALL LOAD MODULES USED DURING EXECUTION.

PLEA CONSISTS OF 2 COMPONENTS, A MONITOR AND TABULATOR. THE MONITOR LOADS THE PL/I PROGRAM TO BE ANALYZED AND THEN SAMPLES EXECUTION AT REGULAR INTERVALS UNTIL THE PROGRAM TERMINATES. DURING EACH SAMPLE, THE MONITOR DETERMINES WHICH STATEMENT WAS BEING EXECUTED IF THE COMPILER STATEMENT OPTION WAS ACTIVE, OTHERWISE THE SAMPLE IS TRACED TO THE PL/I BLOCK. MONITOR DATA IS RECORDED ON A SEQUENTIAL DATASET, AND THIS DATA IS AGGREGATED AND TABULATED BY THE TABULATOR STEP WHICH FOLLOWS EXECUTION OF THE SAMPLED

CONTINUED FROM PRIOR COLUMN

PROGRAM.

PLEA FOR BOTH OPTIMIZER AND PL/I-F ARE SUPPLIED, BUT ONLY THE OPTIMIZER VERSION WILL BE SUPPORTED BY THE AUTHOR. BOTH SYSTEMS WILL RUN ON MVT OR VS2, BUT NOT MFT. THE MONITOR IS AN ASSEMBLER PROGRAM REQUIRING 4K, THE TABULATOR IS A PL/I PROGRAM REQUIRING 100K. DOCUMENTATION INCLUDES INSTALLATION INSTRUCTIONS, USERS GUIDE AND JCL.

DOCUMENTATION: 5 PAGES, NO ADDITIONAL CHARGE.  
(PLUS MACHINE READABLE DOCUMENTATION)  
CARD COUNT: 2,660 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 6/74.

360D-04.2.009  
DUMBBELL OR DEBUGGER

AUTHOR: JOHN M. FITZ

DIRECT TECHNICAL INQUIRIES TO:

JOHN M. FITZ  
1043 SIERRA AVENUE  
BERKELEY, CA 94707

DESCRIPTION - THIS PROGRAM EXECUTES BCUND LINK-EDITED LOAD MODULES INTERPRETIVELY WITH OPTIONS TO PRINT OUT TRACE INFORMATION CONSISTING OF INSTRUCTION IMAGES, REGISTER CONTENTS, AND CORE CONTENTS TO AID IN DEBUGGING. IT IS WRITTEN IN IBM 360 ASSEMBLY LANGUAGE (BAL). THIS IS VERSION 1. THE FIELD OF APPLICATION IS IN TESTING AND DEBUGGING PROGRAMS ESPECIALLY WHEN NORMAL METHODS FAIL. SINCE ITS METHOD OF EXECUTION IS TO EXECUTE MODELS INTERPRETIVELY, IT IS ACTUALLY A SIMULATOR OF THE IBM 360. IT IS A MAIN PROGRAM WHICH LOADS AND EXECUTES A SPECIFIED LOAD MODULE; IT FULLY CONTROLS THE PARTITION IN WHICH IT IS LOADED. THIS VERSION RUNS ON AN IBM 360 UNDER OS/MFT REQUIRING ONLY A PRINTER PLUS ALL DEVICES REQUIRED BY SUBJECT PROGRAMS BEING TESTED.

PROGRAMMING LANGUAGE - 360 ASSEMBLY LANGUAGE

MINIMUM SYSTEM REQUIREMENTS - IBM 360 OS/MFT 132K

DOCUMENTATION: 13 PAGES  
CARD COUNT: 2250 APPROXIMATE.

CONTINUED FROM PRIOR COLUMN

SUBMITTAL/REVISION DATE: 9/75

360D-04.4.012

TSO ANALYSIS - SYSTEM MEASUREMENT - TIME-SHARING PERFORMANCE  
- SIMULATIONAUTHORS: B. J. DIMARSICO  
W. V. DIETRICH  
J. F. MARANZANO

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
NOT CURRENTLY AVAILABLE.DESCRIPTION - THE TSO ANALYSIS PACKAGE IS A SET OF PROGRAMS  
THAT ALLOWS AN INSTALLATION TO MEASURE THE PERFORMANCE OF  
THE TIME SHARING OPTION (TSO) OF THE IBM-360-OS/MVT. THE  
PACKAGE IS COMPOSED OF:

1. A TERMINAL SIMULATOR THAT READS TSO COMMANDS FROM A  
DATA SET AND DRIVES TCAM IN A CONTROLLED MANNER.
2. COMMAND MEASUREMENT ANALYSIS ROUTINE THAT PRODUCES  
COMMAND USAGE STATISTICS.
3. TIME HISTORY PLOTTING ROUTINE THAT SHOWS HOW ONE USER  
INTERACTS WITH AND AFFECTS OTHERS.
4. STATE TRANSITION ANALYSIS ROUTINE THAT DIVIDES TIME  
SHARING TRANSACTIONS INTO STATES OF INTEREST AND  
ACCUMULATES TIME AND COUNTS FOR THOSE STATES.
5. REPORT GENERATOR TO PRODUCE HISTOGRAMS OF THE EVENTS  
OF INTEREST.

THE PROGRAMS ARE WRITTEN IN PL/I, FORTRAN IV, AND OS  
ASSEMBLER LANGUAGE.PROGRAMMING SYSTEM - PROGRAM LANGUAGE - OS/360-MVT; PL/I,  
FORTRAN IV AND OS ASSEMBLER LANGUAGE.

MINIMUM SYSTEM REQUIREMENTS - IBM-360/370

DOCUMENTATION: 154 PAGES, \$6.70 ADDITIONAL CHARGE.

CARD COUNT: 5,120 APPROXIMATE.

SUBMITTAL/REVISION DATE: 09/73

370D-05.0.004

HASP V4.0 RETROFIT TO MFT-II

AUTHOR: JIM ALLEN

DIRECT TECHNICAL INQUIRIES TO:

JIM ALLEN  
COMPUTATION CENTER  
DUKE UNIVERSITY  
DURHAM, NC 27706DESCRIPTION - THIS MODIFICATION RETROFITS HASP V4.0 TO  
MFT-II. ITS PURPOSE IS TO MAKE V4.0 A SUBSYSTEM WHICH RUNS  
UNDER MFT-II JUST AS V3.1 DOES. THE MODIFICATION IS  
APPLICABLE TO R21.7 MFT, BUT THERE IS SOME CODE WHICH WILL  
AID IN THE CONVERSION TO EITHER MVT OR VS1. THE  
MODIFICATION HAS BEEN SUBMITTED FOR DISTRIBUTION SINCE THE  
AUTHOR CONSIDERS IT A GOOD BASE FOR THE GENERAL RETROFIT  
PROBLEM.

PROGRAMMING LANGUAGE - ADVANCED FUNCTION ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - MFT-II

DOCUMENTATION: 3 PAGES, NO ADDITIONAL CHARGE.

(PLUS MACHINE READABLE DOCUMENTATION)

CARD COUNT: 1400 APPROXIMATE.

SUBMITTAL/REVISION DATE: 9/73.

360D-05.1.018

BAYLOR EXECUTIVE SYSTEM FOR TELEPROCESSING (BEST)

AUTHORS: W. HOBBS, J. MCBRIDE, T. BRWEN,  
T. KENDRICK AND A. BEALE

DIRECT TECHNICAL INQUIRIES TO:

ALAN BEALE  
INSTITUTE OF COMPUTER SCIENCE  
BAYLOR COLLEGE OF MEDICINE  
HOUSTON, TEXAS 77025DESCRIPTION - BEST IS A TELEPROCESSING SYSTEM  
WHICH SUPPORTS INTERACTIVE EXECUTION OF MULTIPLE  
JOBS FROM TERMINALS WHILE THE USUAL BATCH JOB STREAMS  
ARE OPERATIONAL. HIGH-LEVEL LANGUAGE INTERFACES ARE  
INCLUDED WITH THE SYSTEM SO THAT INTERACTIVE PROGRAMS



CONTINUED FROM PRIOR COLUMN

MAY BE WRITTEN IN PL/I (F OR X), COBOL, OR FORTRAN, AS WELL AS ASSEMBLER LANGUAGE. ALL JOBS IN THE SYSTEM ARE STORAGE-PROTECTED AND CAN BE TIME-SLICED.

BEST RUNS ON ANY SYSTEM 360/370 RUNNING OS/MFT OR OS/MVT WITH AT LEAST 256K. IT SUPPORTS THE FOLLOWING TERMINAL TYPES: 1050, 2740, 2741, 2260 (LOCAL OR REMOTE), 3277 (LOCAL), 3284 OR 3286 (LOCAL), AND TELETYPE MOD 33/35.

PROGRAMMING LANGUAGE - ASSEMBLER (F)

MINIMUM SYSTEM REQUIREMENTS - SEE DESCRIPTION

DOCUMENTATION: 4 PAGES, NO ADDITIONAL CHARGE.  
(PLUS MACHINE READABLE DOCUMENTATION)  
NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 5/75

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360D-05.1.021

REMOTE HASP TO HASP

AUTHOR: JAMES F. WALKER

DIRECT TECHNICAL INQUIRIES TO:  
JAMES F WALKER  
TRIANGLE UNIVERSITIES COMPUTATION CENTER  
P. O. BOX 12076  
RESEARCH TRIANGLE PARK, N. C. 27709

DESCRIPTION - THE HASP TO HASP CODE IS A MODIFICATION TO THE IBM HASP VERSION 3.0 AND 3.1 CODE TO ALLOW TWO OR MORE HASP SYSTEMS TO TRANSMIT JOBS TO EACH OTHER VIA TELEPROCESSING. INPUT JOBS, OUTPUT JOBS, AND OPERATOR COMMANDS MAY BE TRANSMITTED OVER ALL LINE TYPES SUPPORTED BY HASP MULTILEAVING. ASSEMBLER SOURCE IS PROVIDED, ALONG WITH NECESSARY UPDATE CARDS TO INSERT IN A STANDARD HASPGEN DECK. OS HASP MUST BE INSTALLED IN EACH COMMUNICATING SYSTEM. THE MODIFICATIONS ADD APPROXIMATELY 2K TO AN UNMODIFIED SYSTEM.

SPECIFICATIONS OF THE SYSTEM ARE: 1- MINIMUM HASP MODIFICATIONS, 2- TOTALLY SYMETRICAL, 3- NO SPECIAL HARDWARE, 4- INPUT AND OUTPUT SPOOLING AT EACH HASP SYSTEM 5- FULLY AUTOMATIC OPERATION, 6- TRANSMISSION OF JOB CONTROL DATA, 7- FULL MULTILEAVING DATA TRANSMISSION, 8- FULL REMOTE CONSOLE FACILITY, 9- STANDARD HASP DATA FORMATS OF INPUT QUEUE, OUTPUT QUEUE, AND MULTILEAVING TRANSMISSION BLOCKS, 10- UNLIMITED NETWORK SIZE (CURRENT DISTRIBUTION CONTAINS

CONTINUED FROM PRIOR COLUMN

SOME RESTRICTIONS).

PROGRAMMING SYSTEMS - OS/360 ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - CS/360, HASP, STANDARD IEM COMMUNICATIONS CONTROLLERS ON EACH SYSTEM.

DOCUMENTATION: 20 PAGES, NO ADDITIONAL CHARGE.  
(PLUS MACHINE READABLE DOCUMENTATION)  
NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 02/73

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370D-05.1.022  
VS1 HASP

AUTHOR: JIM ALLEN

DIRECT TECHNICAL INQUIRIES TO:  
JIM ALLEN  
COMPUTATION CENTER  
DUKE UNIVERSITY  
DURHAM, N.C. 27706

DESCRIPTION - VS1 HASP IS A MODIFICATION TO HASP II V4.0 WHICH PROVIDES THE BASIC CAPABILITY TO RUN HASP ON A VS1 RELEASE 4.0 HOST SYSTEM, THE GOAL OF THE MODIFICATION IS TO PROVIDE A VS1-HASP INTERFACE WHICH IS EQUIVALENT TO THE FORMAL INTERFACE BETWEEN VS2 RELEASE 1 AND HASP V4.0. THUS THE HASP SYSTEM OPERATES AS A JOB ENTRY SUBSYSTEM FOR VS1 WITH NO LOSS OF HASP FUNCTION. THE VS1-HASP INTERFACE IS IMPLEMENTED BY USING SVC TABLE INTERCEPTS AND SMF EXITS SO THAT THE INTERFACE IS INDEPENDENT OF THE VS1 HOST AS MUCH AS POSSIBLE. THE TWO MAJOR FEATURES OF THE INTERFACE ARE AN INTERFACE BETWEEN HASP CONSOLE SERVICES AND VS1 MULTIPLE CONSOLE SUPPORT (MCS), AND THE INTERFACE BETWEEN HASP PSEUDO DEVICE I/O SERVICES AND THE VS1 INPUT/OUTPUT SUPERVISOR. THE BULK OF THE MODIFICATIONS ARE ISOLATED INTO HASPINTF, A NEW ASSEMBLY.

THIS MODIFICATION INCLUDES FIXES TO ALL KNOWN BUGS, THE INTEGRATION OF PTF 0Y09762, AND SUPPORT FOR MULTIPLE CONCURRENT READER/INTERPRETERS.

PROGRAMMING LANGUAGE - OS/VS ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - CAPABILITY TO RUN VS1

CONTINUED FROM PRIOR COLUMN

## RELEASE 4.0

DOCUMENTATION: 15 PAGES, NO ADDITIONAL CHARGE.  
 CARD COUNT: NOT AVAILABLE ON CARDS.  
 SUBMITTAL/REVISION DATE: 6/76

360D-05.1.023

TEXAS INTERACTIVE PROGRAMMING SYSTEM (TIPS)

AUTHORS: TOM WORSHAM AND GARY COHEN

## DIRECT INQUIRIES TO:

TOM WORSHAM OR GARY COHEN  
 UNIVERSITY OF TEXAS REGIONAL COMPUTER CENTER  
 5601 MEDICAL CENTER DRIVE  
 DALLAS, TEXAS 75235

DESCRIPTION - TIPS, THE TEXAS INTERACTIVE PROGRAMMING SYSTEM, IS BOTH AN ON-LINE APPLICATION MONITOR AND A GENERALIZED UTILITY SYSTEM. TIPS IS CURRENTLY BEING RUN ON AN IBM 370/155 UNDER OS/MVT. NO OS MODIFICATIONS ARE REQUIRED FOR ITS INSTALLATION.

## ON-LINE APPLICATION SYSTEM

THE ON-LINE APPLICATION SYSTEM CAN RUN AS A MILTEN SUBSYSTEM OR USING BTAM FOR TERMINAL I/O. THE BTAM VERSION, WHICH IS NO LONGER RUN AT UTRCC, SUPPORTS ONLY A SINGLE TERMINAL TYPE (DISTRIBUTED FOR 2741 CORRESPONDENCE). TIPS PROVIDES EASY USER INTERFACES THROUGH THE CALL FACILITY FOR: TERMINAL I/O, IN-CORE WORK AREA ACCESS, DISK WORK AREA ACCESS, ENQ/DEQ ROUTINES, AND DISK DATA SET OPEN ROUTINES. AN APPLICATIONS PROGRAMMER GUIDE IS PROVIDED. TIPS USES MULTI-TASKING TO ALLOW FOR CONCURRENT PROGRAM EXECUTION. APPLICATIONS MAY USE ALL STANDARD OS ACCESS METHODS. AN INTERFACE IS PROVIDED TO ALLOW TIPS TRANSACTIONS TO BE ENTERED FROM THE OPERATOR'S CONSOLE. THE REGION REQUIREMENT FOR TIPS IS 14K PLUS 1K PER USER, PLUS A DYNAMIC AREA FOR LOADING AND EXECUTING USER PROGRAMS.

## TIPS UTILITY SYSTEM

A POWERFUL BATCH UTILITY PROGRAM IS PROVIDED WITH COMPREHENSIVE DOCUMENTATION. IT HAS BEEN SUCCESSFULLY RUN ON A MVT AND MPT SYSTEM. IT OFFERS THE FOLLOWING

CONTINUED FROM PRIOR COLUMN

## ADVANTAGES OVER STANDARD OS UTILITIES:

- (1) CONCISE AND FLEXIBLE CONTROL LANGUAGE
- (2) NO USER JCL IS REQUIRED
- (3) IDEALLY SUITED TO A BATCHER OR EXPRESS ENVIRONMENT
- (4) CONSOLIDATES THE MOST FREQUENTLY USED FUNCTIONS INTO A SINGLE PROGRAM
- (5) PROVIDES CAPABILITIES NOT AVAILABLE IN STANDARD IBM-OS UTILITIES
- (6) BUILT-IN DATA SET SECURITY
- (7) PROVIDES INTERACTIVE EXECUTION IN A MILTEN OR ETAM ENVIRONMENT

## AVAILABLE FUNCTIONS

A	ALLOCATE A DATA SET
AL	ADD AN ALIAS FOR A MEMBER OF A PDS
BLDG	BUILD A GENERATION INDEX
C	CATALOG A DATA SET
CALC	DECIMAL / HEXIDECIMAL CALCULATOR
CONN	CONNECT CONTROL VOLUMES
DCONN	DISCONNECT CONTROL VOLUMES
DLTX	DELETE A CATALOG INDEX
DSCB	DISPLAY OR MODIFY A DSCB
DUMP	DISPLAY MEMORY
FIND	FIND A DATA SET
I	DISPLAY THE ATTRIBUTES OF A DATA SET
L	LOCATE A DATA SET VIA THE CATALOG
LISTLIB	LIST A PARTITIONED DATA SET
LM	LIST THE DIRECTORY OF A PDS
PRINT	PRINT A DATA SET
PUNCH	PUNCH A DATA SET
PURGE	PURGE A PDS
R	RENAME A DATA SET
RM	RENAME A MEMBER OF A PDS
RPT	CALCULATE REQUIRED DISK STORAGE
S	SCRATCH A DATA SET
SM	SCRATCH A MEMBER OF A PDS
SPACE	DISPLAY AVAILABLE DISK STORAGE
U	UNCATALOG A DATA SET
ZAP	INVOKE IMASPZAP

PROGRAMMING LANGUAGE - ALC

MINIMUM SYSTEM REQUIREMENTS - SEE ABSTRACT.

DOCUMENTATION: 11 PAGES, NO ADDITIONAL CHARGE.  
 CARD COUNT: NOT AVAILABLE ON CARDS.  
 SUBMITTAL/REVISION DATE: 04/76

360D-05.1.024

ASP TO HASP LINK

AUTHORS: KAREN ETHINGTON  
CHRIS RECHLY  
KENDALL WHITE

DIRECT TECHNICAL INQUIRIES TO:  
GEORGE COVERT  
B-7 COMPUTER SCIENCE BLDG.  
IOWA STATE UNIVERSITY  
AMES, IOWA 50010

DESCRIPTION - THIS IS A MODIFICATION TO ASP 3.1 WITH PTF 5 APPLIED TO SUPPORT JOB SUBMITTAL BETWEEN ASP AND HASP SYSTEMS OR BETWEEN TWO ASP SYSTEMS. WITH THIS MODIFICATION TO ASP AND THE REMOTE HASP TO HASP MODIFICATION (SHARE PROGRAM LIBRARY 360D-05.1.021) TO HASP3, JOBS CAN BE SUBMITTED AT ONE COMPUTER SITE AND EXECUTED AT ANOTHER COMPUTER SITE USING TELEPROCESSING. SPECIAL FORMS FOR PRINT DATA SETS ARE SUPPORTED BETWEEN SITES USING THE CONTROL CARDS RECOGNIZED BY THE EXECUTING COMPUTER'S SYSTEM, BUT THE DATA SET ROUTING OF ASP IS NOT SUPPORTED.

THE DISTRIBUTION CONSISTS OF SOURCE UPDATES TO MODIFY MACROS AND SOURCE MODULES OF ASP, DOCUMENTATION OF INSTALLATION PROCEDURES AND A UTILITY PROGRAM FROM THE UNIVERSITY OF IOWA FOR TRANSMITTING DATA SETS BETWEEN TWO COMPUTER SITES USING TELEPROCESSING.

PROGRAMMING LANGUAGE - OS/360 ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - ASP RELEASE 3.1 PTF 5,  
HASP 3.0

DOCUMENTATION: 6 PAGES, NO ADDITIONAL CHARGE.  
(PLUS MACHINE READABLE DOCUMENTATION)

CARD COUNT: 4,700 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 6/76

360D-05.2.014

NETUCC 1.1, TSO ENHANCEMENT PACKAGE

AUTHOR: OLE REITZEL JENSEN

DIRECT TECHNICAL INQUIRIES TO:  
OLE REITZEL JENSEN  
TECHNICAL UNIVERSITY OF DENMARK  
BLDG. 305  
L800 LYNGBY  
DENMARK

DESCRIPTION - NETUCC IS A TSO ENHANCEMENT PACKAGE DEVELOPED TO SPEED UP LOGON/LOGOFF AND DYNAMIC ALLOCATION. THE PACKAGE REDUCES THE AMOUNT OF I/O REQUESTS RELATED TO SEVERAL SUPERVISOR FUNCTIONS, INVOLVED DATA SETS BEING LINKLIB, BROADCAST, JOBQUEUE, CATALOGS. VTOC'S AND VTOC USAGE IS OPTIMIZED THROUGH THE USE OF CATALOG DSCB-TTR INFORMATION (NORMALLY ONLY USED FROM BATCH).

THE PACKAGE IS MADE UP OF FIVE INDEPENDENT MODS, EACH AIMED AGAINST SPECIAL SYSTEM DATA SETS. INSTALLATION OF ALL (OR SOME) OF THE MODS CAN BE DONE VERY EASILY THROUGH THE USE OF A SPECIAL INSTALLATION TEST ROUTINE (INCLUDED IN THIS PACKAGE). ONLY CHANGES TO PARMIE ARE NECESSARY TO GET THIS CODE TO RUN. ASSEMBLER IS USED FOR ALL PARTS OF THE PACKAGE, SOME SYSTEM EXPERIENCE IS RECOMMENDED FOR INSTALLATIONS ORDERING NETUCC.

NETUCC IS DEVELOPED FOR MVT RELEASE 21.X (AND SVS). STORAGE REQUIREMENTS FOR RUNNING THE PACKAGE ARE 20-30K. (THESE ENHANCEMENTS WERE DEVELOPED BY MR. REITZEL JENSEN AT TRIANGLE UNIVERSITIES COMPUTATION CENTER AS PART OF A 6-MONTH PROGRAMMER EXCHANGE BETWEEN TUCC AND THE TECHNICAL UNIVERSITY OF DENMARK.)

PROGRAMMING LANGUAGE - ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - OS-MVT WITH TSO

DOCUMENTATION: 16 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 12/75

CONTINUED FROM PRIOR COLUMN

360D-05.2.015

INTER-SYSTEM SHARED ENQUE

AUTHOR: STANDARD OIL CO. (INDIANA)

DIRECT INQUIRIES TO:

SOFTWARE DEVELOPMENT DIVISION  
STANDARD OIL COMPANY (INDIANA)  
200 EAST RANDOLPH DRIVE  
CHICAGO, ILLINOIS 60601

DESCRIPTION - INTER-SYSTEM SHARED ENQUE, AS IMPLEMENTED BY STANDARD OIL CO., IS DESIGNED TO REPLACE THE RESERVE OF A COMPLETE VOLUME WITH AN ENQ ACROSS SYSTEM FOR ONLY THE RESOURCES REQUIRED. THIS IS ACCOMPLISHED BY ENQUING THE SAME RESOURCE IN BOTH SYSTEMS VIA A CHANNEL TO CHANNEL ADAPTER.

PROGRAMMING LANGUAGE - ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - OS REL 21

DOCUMENTATION: 94 PAGES, \$3.70 ADDITIONAL CHARGE.  
CARD COUNT: 18,200 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 12/75

360D-05.2.016

DDSS - DYNAMIC DATA SET SECURITY SHARED DASD ENQUE

AUTHORS: JAMES CLAYTON, STEVE JONEZ, RICK CROWELL

DIRECT TECHNICAL INQUIRIES TO:

JAMES CLAYTON  
TRANSAMERICA INFORMATION SERVICES  
1149 S. BROADWAY STREET  
LOS ANGELES, CA 90015

DESCRIPTION - DDSS WAS DESIGNED TO SOLVE THE 'SHARED DASD' EXCESSIVE RESERVE PROBLEMS IN A MULTIPLE-CPU ENVIRONMENT. DDSS PROVIDES DATA SET LEVEL 'LOGICAL RESERVES' THEREBY LIMITING THE NEED FOR DEVICE LEVEL PHYSICAL RESERVES. DDSS FACILITIES ARE PROVIDED VIA OPEN/CLOSE INTERFACE ROUTINES AND INTER-SYSTEM COMMUNICATION FOR EACH SELECTED DIRECT ACCESS DATA SET SUBJECT TO DDSS PROTECTION.

ALTHOUGH DDSS IS SPECIFICALLY DESIGNED FOR A MULTIPLE-CPU, SHARED DASD ENVIRONMENT, SOME OF THE PHILOSOPHIES AND FEATURES INCORPORATED INTO DDSS MAY HAVE UTILITY IN A NON SHARED DASD ENVIRONMENT. SOME OF THESE FEATURES ARE:  
-DATA SET USE RESTRICTED TO THE DURATION OPEN/CLOSE RATHER THAN JOB DURATION.  
-THREE LEVELS OF DATA SET 'ENQUE'; SHARED, EXCLUSIVE AND WRITE/EXCLUSIVE.  
-EXTENSIVE OPERATOR/USER COMMUNICATION.

PROGRAMMING LANGUAGE - OS ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - MFT/MVS/SVS

DOCUMENTATION: 3 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 10/76

360D-05.5.002

SLAC MODIFICATIONS TO OS/V5 LOADER

AUTHOR: JOHN R. EHRMAN

DIRECT TECHNICAL INQUIRIES TO:

JOHN R. EHRMAN (MAIL BIN 97)  
STANFORD LINEAR ACCELERATOR CENTER  
P. O. BOX 4349  
STANFORD, CA 94305

DESCRIPTION - THESE MODIFICATIONS TO THE OS/V5 LOADER PROVIDE TWO MAJOR CONVENIENCE FEATURES FOR THE USER:

- (1) ALL NAMES CALLED FROM SYSLIB DATA SETS (VIA AUTOCALL) ARE FLAGGED IN THE LOAD MAP, AND ARE LISTED IN THE CONCATENATION NUMBER DICTIONARY WITH THE DATA SET NAME AND VOLUME ID FROM WHICH THEY WERE LOADED;
- (2) UNRESOLVED EXTERNAL REFERENCES (ER) ARE CAUGHT, AND A DIAGNOSTIC MESSAGE IS PRINTED, IF A BRANCH TO A NON-EXISTENT ROUTINE IS ATTEMPTED.

IN ADDITION, THE DATA DERIVED FROM (1) ABOVE IS WRITTEN TO THE SMF DATA SET, USING A SPECIAL SVC ROUTINE. THIS DATA CAN BE USED TO MONITOR PROGRAM USAGE, LOAD LIBRARY ACCESS PATTERNS, DISTRIBUTE COSTS OF USER LIBRARIES, ETC.

USER AND SYSTEMS DOCUMENTATION IS INCLUDED ON THE DISTRIBUTION TAPE.

CONTINUED FROM PRIOR COLUMN

PROGRAMMING LANGUAGE/SYSTEMS - OS/VS, OS/MVT  
 MINIMUM SYSTEM REQUIREMENTS - OS/MVT/MFT, OS/VS  
 DOCUMENTATION: 3 PAGES, NO ADDITIONAL CHARGE.  
 (PLUS MACHINE READABLE DOCUMENTATION)  
 CARD COUNT: 11,000 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 7/76

360D-06.0.007

FORMAT, A TEXT-PROCESSING PROGRAM

AUTHOR: GERALD M. BERNS, JOHN R. EHRMAN

DIRECT TECHNICAL INQUIRIES TO:  
 DR. JOHN R. EHRMAN  
 STANFORD CENTER FOR INFORMATION PROCESSING  
 SLAC - BIN 97  
 POST OFFICE BOX 4349  
 STANFORD, CALIFORNIA 94305

DESCRIPTION - FORMAT IS A PROGRAM FOR S/360 AND S/370  
 DESIGNED TO MEET THE NEED FOR A RAPID METHOD OF EDITING AND  
 PRODUCING PAPERS, REPORTS, AND OTHER FINISHED AND  
 REPRODUCIBLE DOCUMENTS DIRECTLY ON THE SYSTEM PRINTER, USING  
 UPPER/LOWER CASE AND SPECIAL CHARACTERS. IT HAS  
 FACILITIES WHICH SIMPLIFY THE TASK OF INDEX CONSTRUCTION.  
 INPUT TO THE PROGRAM IS FREE-FORM CARD-IMAGE TEXT. THE  
 DOCUMENT IS FORMATTED AND CONTROLLED ACCORDING TO CONTROL  
 CARDS AND COMMAND WORDS INTERSPERSED THROUGHOUT THE INPUT.  
 FORMAT IS A SINGLE PROGRAM REQUIRING NO AUXILIARY PROGRAMS  
 FOR ITS OPERATION. FORMAT PRODUCES ITS NORMAL OUTPUT FOR  
 THE TN PRINT TRAIN, AND HAS FACILITIES TO PRINT ALL OF THE  
 120 POSSIBLE CHARACTERS. NOTE THAT NO SUBSCRIPTS ARE  
 PROVIDED BY THE TN PRINT TRAIN, NOR, THEREFORE, BY FORMAT.

PROGRAMMING SYSTEMS - FORMAT IS WRITTEN ENTIRELY IN FULL  
 FORTRAN IV AND REQUIRES THE FULL FORTRAN LIBRARY.

MINIMUM SYSTEM REQUIREMENTS - FORMAT REQUIRES A MINIMUM  
 MEMORY SIZE OF 64K IN A STANDARD OS/360. NO ADDITIONAL  
 DEVICES ARE REQUIRED BEYOND THOSE NECESSARY TO OPERATE  
 S/360. HOWEVER, THE AVAILABILITY OF MAGNETIC TAPE DRIVES  
 TO THE PROGRAM GREATLY ENHANCE ITS USEFULNESS. NORMAL  
 OUTPUT MODE IS UPPER AND LOWER CASE. MEANS ARE PROVIDED  
 TO ALLOW THE USER TO SPECIFY UPPER CASE ONLY AND SPECIAL

CONTINUED FROM PRIOR COLUMN

CHARACTERS.

DOCUMENTATION: 76 PAGES, \$2.80 ADDITIONAL CHARGE.  
 CARD COUNT: 6,140 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 06/71

360D-06.0.008

PRINT - A TEXT FORMATTING PROGRAM

AUTHOR: JAMES E. GEORGE

DIRECT TECHNICAL INQUIRIES TO:  
 DR. JAMES E. GEORGE  
 LOS ALAMOS SCIENTIFIC LABORATORY  
 P.O. BOX 1663, MS 272  
 LOS ALAMOS, NEW MEXICO 87545

DESCRIPTION - PRINT IS A TEXT FORMATTING PROGRAM WRITTEN IN  
 PL/I TO PRODUCE DOCUMENTS USING THE PRINTER. THE INPUT TO  
 PRINT CONTAINS THE TEXT TO BE PRINTED INTERSPERSED WITH THE  
 NECESSARY CONTROL INFORMATION TO GENERATE THE DESIRED FORMAT  
 OF THE TEXT. THE FEATURES SUPPORTED BY PRINT ARE:  
 AUTOMATIC OR MANUAL PAGING  
 PAGE NUMBERING WITH OR WITHOUT TITLING  
 PARAGRAPHING WITH OR WITHOUT INDENTATION (LEFT  
 OR RIGHT), NUMBERING AND/OR TITLING  
 UNDERLING  
 TABLES WITH OR WITHOUT NUMBERING  
 PRINT DIRECT IMAGE (I.E. PRINT TEXT AS IS)  
 RIGHT JUSTIFICATION OF TEXT  
 TABS

ALSO, THE MARGIN, LINE LENGTH AND SPACING BETWEEN LINES ARE  
 VARIABLE. THE AIM WAS TO PROVIDE A MODULAR SYSTEM WHICH  
 WOULD BE EASY TO CHANGE AND WOULD ALLOW THE VALUE OF ANY  
 CONTROL VARIABLE TO BE CHANGED BY INPUT CONTROL.

PROGRAMMING LANGUAGE - PL/I (F)

MINIMUM SYSTEM REQUIREMENTS - OS/360

DOCUMENTATION: 32 PAGES, \$.60 ADDITIONAL CHARGE.  
 CARD COUNT: 1,150 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 4/73

360D-06.0.009

## COMPARE DATA SET UTILITY

AUTHOR: DAVID GOMBERG

## DIRECT TECHNICAL INQUIRIES TO:

DAVID GOMBERG

U76

UNIVERSITY OF CALIFORNIA AT SAN FRANCISCO  
SAN FRANCISCO, CA 94143

DESCRIPTION - COMPARE IS A PL1 MAIN PROGRAM DESIGNED TO COMPARE TWO DATA SETS, REPORTING ON AND RECOVERING FROM COMMON DISCREPANCIES. IT IS USEFUL FOR TESTING OUTPUT FROM A NEW VERSION OF A PROGRAM AGAINST AN OLDER VERSION OF A PROGRAM WHERE DISCREPANCIES (SUCH AS ADDITIONAL RECORDS IN THE NEW VERSION) ARE EXPECTED. BY USING AN OPTION WHICH ALLOWS THE PROGRAM TO IGNORE LEADING OR TRAILING COLUMNS, SOURCE DECKS WHICH HAVE BEEN RESEQUENCED CAN BE COMPARED FOR CHANGES IN CODE.

COMPARE REQUIRES ABOUT 100K MAIN MEMORY PLUS STORAGE FOR BUFFERS AND STACKS OF UNMATCHED RECORDS. IT USES AN ASSEMBLER LANGUAGE SUBROUTINE TO ATTEMPT TO PREDICT INSUFFICIENT MAIN MEMORY AND TERMINATE NEATLY.

PROGRAMMING LANGUAGE - PL/1 OPTIMIZING COMPILER.

MINIMUM SYSTEM REQUIREMENTS - 360/370 OS, 100K MEMORY.

DOCUMENTATION: 3 PAGES, NO ADDITIONAL CHARGE.  
(PLUS MACHINE READABLE DOCUMENTATION)

NOT AVAILABLE ON CARDS.

SUBMITTAL/REVISION DATE: 12/74

360D-06.1.006

SIMPLIFIED INTERFACE FOR INVOKING SORT FROM  
PL/I OPTIMIZER PROGRAMS (A#SORT)

AUTHOR: FRITZ SCHNEIDER

## DIRECT TECHNICAL INQUIRIES TO:

FRITZ SCHNEIDER

AMDAHL CORPORATION

1250 EAST ARQUES AVENUE  
SUNNYVALE, CALIF. 94086

DESCRIPTION - THIS SUBROUTINE ALLOWS PL/I OPTIMIZER PROGRAMS TO DYNAMICALLY INVOKE OS SORT/MERGE AND PASS RECORDS TO BE SORTED USING WRITE AND READ STATEMENTS RATHER THAN THE CUMBERSOME PLISRTD METHOD SUPPLIED WITH THE SYSTEM.

TO USE IT, THE PROGRAMMER CALLS A#SORT PASSING A DUMMY FILE NAME AND THE PARAMETERS NECESSARY TO DESCRIBE TO SORT. THEN A WRITE STATEMENT CAN BE USED TO TRANSMIT EACH RECORD TO BE SORTED INTO SORT. WHEN ALL RECORDS HAVE BEEN PASSED, A READ STATEMENT WILL RETRIEVE THE SORTED RECORDS. ENDFILE WILL BE USED TO INDICATE THAT NO MORE SORTED RECORDS ARE AVAILABLE. ERROR CONDITIONS ARE SIGNALLED VIA ON CONDITIONS.

PROGRAMMING LANGUAGE - ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - OS OR OS/VS, PL/I OPTIMIZER,  
MULTITASKINGDOCUMENTATION: 3 PAGES, NO ADDITIONAL CHARGE.  
(PLUS MACHINE READABLE DOCUMENTATION)

CARD COUNT: 533 APPROXIMATE.

SUBMITTAL/REVISION DATE: 6/76

360D-06.3.012

## A HIGH SPEED BISYNCHRONOUS COMMUNICATIONS ACCESS METHOD

AUTHOR: G.M. STABLER

## DIRECT TECHNICAL INQUIRIES TO:

G.M. STABLER  
 BOX F  
 BROWN UNIVERSITY  
 PROVIDENCE, R.I. 02912

DESCRIPTION - THE BISYNCHRONOUS COMMUNICATIONS ACCESS METHOD IS A SET OF 360 PROGRAMS WHICH SUPPORT QUEUED TELECOMMUNICATIONS OVER A HIGH SPEED (40.8K BAUD) POINT-TO-POINT HALF DUPLEX LINE CONNECTING A 360 AND AN 1130 OR ANOTHER 360.

THE SYSTEM, WHICH EMPLOYS EXCP FOR ALL I/O AND HANDLES ALL MESSAGE BLOCKING, LINE PROTOCOL, AND ERROR CHECKING INTERNALLY, IS CALLED AT THE GET/PUT LEVEL FROM ASSEMBLY LANGUAGE PROGRAMS. THE SYSTEM WILL SUPPORT ANY NUMBER OF LOGICAL USERS (MESSAGE DESTINATIONS) IN EITHER MACHINE, AND CAN SUPPORT ANY NUMBER OF REMOTE TERMINALS. SINCE ALL USER MESSAGES ARE TRANSMITTED IN "TRANSPARENT TEXT" MODE, THERE ARE NO RESTRICTIONS ON THE TYPE OF DATA A USER MAY SEND. LINE PROTOCOL CONFORMS TO CONVERSATIONAL BISYNCHRONOUS COMMUNICATIONS STANDARDS.

PROGRAMMING SYSTEMS - SUPPORT ANALOGOUS TO THIS PACKAGE IS PROVIDED FOR AN 1130 SYSTEM BY THE TYPE 4 PROGRAM ENTITLED "AN 1130 HIGH SPEED BISYNCHRONOUS COMMUNICATIONS SYSTEM". WRITTEN IN ASSEMBLER LANGUAGE; OPERATES UNDER OS/360 MVT.

MINIMUM SYSTEM REQUIREMENTS - SAME AS THOSE REQUIRED FOR OS/360 MVT.

DOCUMENTATION: 14 PAGES, NO ADDITIONAL CHARGE.  
 CARD COUNT: 2,400 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 09/69

1130-06.3.017

## ENHANCED HASP RTP1130 WORKSTATION FOR DISK I/O

AUTHOR: WILLIAM F. DECKER

## DIRECT TECHNICAL INQUIRIES TO:

WILLIAM F. DECKER  
 COMPUTER CENTER - LCM  
 UNIVERSITY OF IOWA  
 IOWA CITY, IOWA 52240

DESCRIPTION - ALLOWS CURRENT USERS OF THE HASP 1130 WORKSTATION (RTP1130) TO ADD DISK INPUT AND OUTPUT ACCESS. WHILE ONLINE TO HASP, DMS-II DISK FILES MAY BE TRANSMITTED TO HASP OR WRITTEN WITH DATA RETRIEVED FROM HASP. NO MODIFICATIONS TO HASP ARE REQUIRED. SUPPORTS ANY AND ALL IBM DISKS FOR THE 1130. ANY NUMBER OF DISKS MAY BE ONLINE CONCURRENTLY. DISKS MAY BE LOADED AND UNLOADED WHILE ONLINE.

PROGRAMMING LANGUAGE - S/360 BASIC ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - 1130 DMS-II AND HASP

DOCUMENTATION: 25 PAGES, \$.25 ADDITIONAL CHARGE.  
 CARD COUNT: 1525 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 3/74.

360D-06.5.006

## UNIVAC-1108 TO IBM-360 FLOATING POINT INTERNAL CONVERTER ('CVFLO8')

AUTHOR: UN YOUNG RHEE

## DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
 CURRENTLY NOT AVAILABLE.

DESCRIPTION - THE S/360 ASSEMBLER CVFLO8 PROGRAM IS DESIGNED TO CONVERT UNIVAC 1108 FLOATING POINT SINGLE PRECISION NUMBER(S) TO 360 FLOATING POINT SINGLE OR DOUBLE PRECISION NUMBER(S). THIS SUBROUTINE CAN BE CALLED BY EITHER FORTRAN OR PL/I PROGRAMS. HOWEVER, IN A PL/I PROGRAM, PARTICULAR ATTENTION SHOULD BE PAID TO ATTRIBUTES OF PASSING PARAMETERS. (MORE DETAILED INFORMATION SUCH AS CALLING

CONTINUED FROM PRIOR COLUMN

SEQUENCE, ACCURACY OF SIGNIFICANT BITS, ETC., CAN BE FOUND IN COMMENT SECTION OF THE PROGRAM LISTING).

PROGRAMMING SYSTEMS - WRITTEN IN ASSEMBLER (F), AND HAS BEEN COMPILED AND TESTED USING OS ON A S/360 MODEL 50.

MINIMUM SYSTEM REQUIREMENTS - THE CVFLO8 PROGRAM SHOULD RUN ON ANY S/360 MODEL 30 AND UP.

DOCUMENTATION: 8 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 200 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 12/68

360D-06.6.003

FORTRAN CHARACTER STRING PACKAGE

AUTHOR: H. P. SIEGLAFF

DIRECT TECHNICAL INQUIRIES TO:  
H. P. SIEGLAFF  
3610 W. NORTHVIEW  
PHOENIX, ARIZONA 85021

DESCRIPTION - THE PACKAGE ENABLES THE FORTRAN PROGRAMMER TO PROCESS CHARACTER STRINGS. THE FORTRAN PROGRAMMER CAN COMPARE, FILTER, INSERT, MOVE, SCAN, AND BINARY SEARCH CHARACTER STRINGS BY CALLING ONE OR MORE OF THE SIX SUBROUTINES.

PROGRAMMING SYSTEMS - THE PACKAGE CONSISTS OF SUBROUTINES WRITTEN IN OS ASSEMBLY LANGUAGE F AND WAS TESTED USING OS FORTRAN LANGUAGE 4 G LEVEL AND OS VERSION 13.

MINIMUM SYSTEM REQUIREMENTS - THE PACKAGE SHOULD WORK ON ANY S/360 MACHINE WHICH HAS FORTRAN IV G AND OS. (MAXIMUM CORE REQUIREMENTS IS 1K).

DOCUMENTATION: 17 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 350 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 12/68

360D-06.6.004

CHARACTER FILTER PL/I

AUTHOR: H. P. SIEGLAFF

DIRECT TECHNICAL INQUIRIES TO:  
H. P. SIEGLAFF  
3610 W. NORTHVIEW  
PHOENIX, ARIZONA 85021

DESCRIPTION - THE SUBROUTINE PROVIDES A MEANS TO SKIP OR SEEK SPECIFIED CHARACTERS WHILE SCANNING A STRING OF CHARACTERS FOR A PL/I PROGRAM. THE ROUTINE CAN BE USED TO FILTER IN/OUT ALPHABETIC, NUMERIC, ALPHANUMERIC, OR OTHER CHARACTERS WHILE SCANNING A CHARACTER STRING.

PROGRAMMING SYSTEMS - THE SUBROUTINE IS WRITTEN IN OS ASSEMBLY LANGUAGE F AND WAS TESTED USING OS PL/I LANGUAGE F LEVEL AND OS VERSION 13 ON A S/360 MODEL 50.

MINIMUM SYSTEM REQUIREMENTS - THE PACKAGE SHOULD WORK ON ANY S/360 MACHINE WITH FORTRAN IV G AND OS. (MAXIMUM CORE REQUIREMENTS IS 1K).

DOCUMENTATION: 8 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 150 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 12/68

360D-06.7.018

BSEARCH - A RANDOM ACCESS BINARY-SEARCH TECHNIQUE FOR SEQUENTIAL FILES ON DISK OR DRUM

AUTHOR: R. K. SIPHERD

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
CURRENTLY NOT AVAILABLE

DESCRIPTION - TO SEARCH A SEQUENTIALLY ORGANIZED FILE ON A DIRECT-ACCESS DEVICE CONTAINING FIXED LENGTH RECORDS, BLOCKED OR UNBLOCKED, BY MEANS OF A BINARY-SEARCH TECHNIQUE. THE DESIRED LOGICAL RECORD IS PLACED INTO USER-SPECIFIED RECEIVING AREA IF IT CAN BE FOUND; IF IT IS NOT FOUND, BLANKS ARE PUT INTO THE AREA.



CONTINUED FROM PRIOR COLUMN

WHEN SEARCH A LARGE, SEQUENTIALLY ORGANIZED FILE ON A DISK OR DRUM THIS ROUTINE WILL SIGNIFICANTLY IMPROVE RUN TIME BY REQUIRING ONLY AN ABSOLUTE MINIMUM NUMBER OF I/O OPERATIONS, AS OPPOSED TO A SEQUENTIAL SEARCH WHICH MUST READ ON THE AVERAGE, HALF THE FILE TO FIND THE RECORD. IMPROVEMENT IS PARTICULARLY NOTICEABLE IN CASES WHERE THE SAME FILE MUST BE SEARCHED REPETITIVELY.

PROGRAMMING SYSTEMS - WRITTEN IN OS/360 ASSEMBLER LANGUAGE. TIMING: RANGES FROM UNDER 0.25 SEC. TO ABOUT 0.90 SEC., DEPENDING ON DEVICE TYPE, NUMBER OF EXTENTS, BLOCKING FACTOR, AND FILE SIZE. SEE PROGRAM WRITE-UP FOR OPTIMIZATION TECHNIQUES.

MINIMUM SYSTEM REQUIREMENTS - STORAGE REQUIRED, 1440 BYTES FOR PROGRAM, PLUS EITHER 350 BYTES OR THE FILE BLOCKSIZE, WHICH EVER IS LARGER.

NOTES: CURRENTLY IMPLEMENTED ONLY FOR 2311, 2314, AND 2301 DEVICES.

DOCUMENTATION: 18 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 550 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 12/68

360D-06.7.019

KWADE - KEYWORD AS A DICTIONARY ENTRY

AUTHOR: H. P. SIEGLAFF

DIRECT TECHNICAL INQUIRIES TO:

H. P. SIEGLAFF  
3610 W. NORTHVIEW  
PHOENIX, ARIZONA 85021

DESCRIPTION - THESE FORTRAN SUBROUTINES GENERATE KWOC AND LEFT JUSTIFIED KWIC OUTPUT FROM A CHARACTER STRING SUPPLIED BY THE USER.

THE OUTPUT CAN VARY IN SIZE AS FOLLOWS:

OUTPUT RECORD - INPUT RECORD + MAXIMUM SIZE KEYWORD + 2  
OUTPUT RECORD MUST BE LESS THAN OR EQUAL TO 256  
CHARACTERS.

THE SUBROUTINES CAN BE USED TO PROCESS TITLES AND/OR KEYWORDS OF ARTICLES OF A JOURNAL.

CONTINUED FROM PRIOR COLUMN

PROGRAMMING SYSTEMS - THE SUBROUTINES WERE TESTED USING OS FORTRAN LANGUAGE 4 G LEVEL, OS FORTRAN LANGUAGE 4 H LEVEL, AND OS VERSION 13 ON A S/360 MODEL 50.

MINIMUM SYSTEM REQUIREMENTS - 4K BYTES OF CORE ARE REQUIRED IN ADDITION TO MEANS OF GETTING INFORMATION INTO AND FROM CORE (E.G. CARD READER, CRT, DISK, DRUM, PRINTER OR TAPE). THE PACKAGE SHOULD WORK ON ANY S/360 MACHINE WHICH HAS FORTRAN IV G AND OS. (MAXIMUM CORE REQUIREMENT IS 1K).

DOCUMENTATION: 20 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 400 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 12/68

360D-06.7.022

OS/360 QUIC (KWIC INDEXING)

AUTHOR: J. A. STARKWEATHER  
R. KARPINSKI

DIRECT TECHNICAL INQUIRIES TO:

R. KARPINSKI  
INFORMATION SYSTEMS, 76-U  
UNIVERSITY OF CALIFORNIA  
SAN FRANCISCO, CA 94143

DESCRIPTION - QUIC PRODUCES KWIC INDEXES FOR A VARIETY OF PURPOSES. MANY OPTIONS PERMIT MODIFYING VARIOUS ASPECTS OF THE PROCESS AND RESULTS. THE PROGRAM IS RUN AS A THREE STEP JOB: INPUT-(PL/I); SORT-(OS/360 SORT-MERGE); OUTPUT-(PL/I).

PROGRAMMING SYSTEMS - WRITTEN IN PL/1 FOR OS/360.

MINIMUM SYSTEM REQUIREMENTS - APPROXIMATELY 100K BYTES ARE USED BUT THE PROGRAM REQUIRES NO SPECIAL EQUIPMENT.

DOCUMENTATION: 15 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 1,550 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 12/68

CONTINUED FROM PRIOR COLUMN

360D-06.7.026

## THE NRIMS ADDRESSING SYSTEM

AUTHOR: ANDRZEJ P. K. DABROWSKI

## DIRECT TECHNICAL INQUIRIES TO:

ANDRZEJ P. K. DABROWSKI  
 COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH  
 P. O. BOX 395  
 PRETORIA. SOUTH AFRICA

DESCRIPTION - THE NRIMS ADDRESSING SYSTEM PROVIDES FOR THE MAINTENANCE AND OPERATION OF A SINGLE ADDRESS LIST FOR A WIDE SPECTRUM OF SUBSCRIBERS. THE RECORD FOR EACH SUBSCRIBER CONTAINS IN ADDITION TO HIS ADDRESS, INFORMATION REGARDING THE PARTICULAR PUBLICATIONS HE WISHES TO RECEIVE, HIS DISCIPLINARY FIELDS OF INTEREST, AND HIS CATEGORY OF EMPLOYMENT AND PROFESSIONAL STATUS. THESE THREE CRITERIA CAN BE USED TO GENERATE A MAILING LIST, PRINTED ON CONTINUOUS FORM ADDRESS LABEL PAPER, FOR THE PARTICULAR MATERIAL WHICH IS TO BE MAILED.

PROGRAMMING SYSTEMS - PROGRAMMING LANGUAGE - OS/360  
 ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED BY OS/360

DOCUMENTATION: 35 PAGES, \$.75 ADDITIONAL CHARGE.  
 CARD COUNT: 5,650 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: /71

360D-06.7.027

## BAYLOR INFORMATION ANALYSIS SYSTEM (BIAS)

AUTHOR: ALAN BEALE

## DIRECT TECHNICAL INQUIRIES TO:

ALAN BEALE  
 INSTITUTE OF COMPUTER SCIENCE  
 BAYLOR COLLEGE OF MEDICINE  
 1200 MOURSUND  
 HOUSTON, TEXAS 77025

DESCRIPTION - BIAS, THE BAYLOR INFORMATION ANALYSIS SYSTEM, IS A VERSATILE DATA BASE SYSTEM. IT ALLOWS ACCESS TO ANY NUMBER OF DATA BASES, CONTAINING RECORDS

OF VARYING LENGTH, COMPLEXITY AND INDEXING STRUCTURE, BY ANY NUMBER OF USERS, BOTH IN BATCH AND INTERACTIVELY. COMPONENTS OF THE SYSTEM ARE:

1. THE BIAS FILER. THIS COMPONENT MAKES ALL ADDITIONS, DELETIONS AND UPDATES TO BIAS DATA. BECAUSE THIS ACTIVITY IS CONCENTRATED IN ONE TASK, VARIOUS SYNCHRONIZATION AND RELIABILITY PROBLEMS ARE AVOIDED.
2. THE BIAS TP PROGRAM. THIS IS A MULTI-USER INTERACTIVE PROGRAM TO RETRIEVE, MODIFY, DELETE AND ADD INDIVIDUAL DATA RECORDS.
3. THE BIAS TABLE ASSEMBLER. THIS IS A BATCH PROGRAM USED TO DEFINE TO BIAS THE LAYOUT AND INDEXING STRUCTURE OF THE RECORDS OF A DATA BASE. IT ALSO PROVIDES DATA PASSWORDS AND THE DEGREE OF PROTECTION DESIRED.
4. THE BIAS RETRIEVAL PROGRAM (BOOLRET). THIS IS AN INTERACTIVE PROGRAM ALLOWING A DATA BASE TO BE SEARCHED FOR RECORDS THAT SATISFY ONE OR MORE PROPERTIES, GATHERING STATISTICS AND FREQUENCY COUNTS ON SELECTED ITEMS IN THE PROCESS. THE PROPERTIES ARE EXPRESSED IN THE FORM OF "BOOLEAN QUESTIONS", USING AN ALGOL-LIKE LANGUAGE.
5. VARIOUS UTILITIES, BOTH SYSTEM AND USER. USER UTILITIES INCLUDE A LOADER, TO LOAD DATA INTO THE SYSTEM, AND AN INTERACTIVE PASSWORD MODIFICATION UTILITY. SYSTEM UTILITIES INCLUDE A FILE RECOVERY PROGRAM AND A SYSTEM ACCOUNTING ROUTINE.
6. ALL FACILITIES OF BIAS ARE AVAILABLE TO PROGRAMS WRITTEN IN PL/I, THROUGH USE OF SEVERAL LIBRARIES OF INTERFACE ROUTINES. THESE INCLUDE RECORD MODIFICATION AND RETRIEVAL ROUTINES, PASSWORD VERIFICATION ROUTINES, AND CONVERSION ROUTINES.

## IMPORTANT FEATURES OF THE SYSTEM ARE:

1. ALL DATA IS STORED IN ONE OS DATA SET, THEREBY REDUCING OVERHEAD AND THE NEED TO PROVIDE ROOM FOR GROWTH FOR EACH DATA BASE INDEPENDENTLY. DATA STORED ON THIS FILE IS GENERALLY STORED IN "BLANK-SUPPRESSED" FORM, SO THAT NO SPACE IS OCCUPIED BY MISSING DATA. THE FILER IS THE ONLY TASK IN THE BIAS SYSTEM THAT CAN USE THE BIAS DATA FILE FOR OUTPUT. EVEN THOUGH ALL DATA IS

CONTINUED FROM PRIOR COLUMN

STORED IN THE SAME DATA SET, A USER MAY ONLY RETRIEVE OR MODIFY DATA FOR WHICH HE PROVIDES THE CORRECT PASSWORD. FURTHER, PASSWORDS MAY BE EASILY (AND INTERACTIVELY) CHANGED AT ANY TIME.

2. A DATA CLASS MAY BE REFINED AFTER CREATION, IF APPROPRIATE. THE INDEXING STRUCTURE MAY NOT BE CHANGED, BUT DATA ITEMS MAY BE ADDED, REMOVED OR CHANGED IN CHARACTERISTICS. THE RECORD SIZE MAY ALSO BE INCREASED OR DECREASED. HOWEVER, ANY RECORD WHOSE MEANING IS CHANGED BY THIS PROCESS SHOULD BE REFILED.
3. FILE REORGANIZATION IS PERIODICALLY NECESSARY. HOWEVER, THE REORGANIZATION PROCESS (CALLED "DATASPACE RECLAMATION") IS PERFORMED BY THE FILER, AND DOES NOT INHIBIT THE COMPLETE USE OF THE SYSTEM, OTHER THAN BY FRACTIONALLY INCREASING RESPONSE TIME.
4. FILE INTEGRITY IS PRESERVED EVEN IF THE FILER ABENDS, OR THE OPERATING SYSTEM CRASHES. ADDITIONALLY, THE SYSTEM MAY BE GENERATED TO RECORD ALL UPDATE TRANSACTIONS. IF THE FILE IS HARMED OR LOST, IT MAY BE RESTORED FROM A BACKUP, AND BROUGHT UP TO DATE THROUGH APPLICATION OF THE RECORDED TRANSACTIONS, USING A SYSTEM UTILITY.

SYSTEM CHARACTERISTICS OF BIAS ARE:

1. THE INTERACTIVE PARTS OF BIAS WERE WRITTEN UNDER BEST (THE BAYLOR EXECUTIVE SYSTEM FOR TELEPROCESSING), WHICH IS IN THE SHARE PROGRAM LIBRARY (360D-05.1.018). THE SYSTEM IS ADAPTABLE TO OTHER TP SYSTEMS (E.G., TSO), AND SUGGESTIONS ARE INCLUDED IN THE DOCUMENTATION FOR CONVERSION.
2. BIAS RUNS EXCLUSIVELY AS A PROBLEM PROGRAM. IT MAKES USE OF ONE USER SVC (TYPE II OR III) FOR INTER-REGION COMMUNICATION.
3. BIAS IS CURRENTLY RUNNING UNDER OS/MFT, RELEASE 21.8. IT SHOULD RUN WITHOUT CHANGE UNDER MVT, BUT THIS HAS NOT BEEN TESTED. BIAS SHOULD ALSO RUN UNDER VS1, PROVIDED THE TP INTERFACES WERE CHANGED TO USE A VS1-SUPPORTED SYSTEM. IT SHOULD ALSO RUN UNDER VS2 WITH AN APPROPRIATE TP SYSTEM, IF THE COMMUNICATION SVC WERE REWRITTEN.
4. BIAS IS WRITTEN IN ASSEMBLY LANGUAGE AND PL/I. THE CRITICAL SYSTEM COMPONENTS, SUCH AS THE FILER AND

CONTINUED FROM PRIOR COLUMN

THE TP PROGRAM, ARE WRITTEN IN ASSEMBLY LANGUAGE. THE PL/I COMPONENTS WERE WRITTEN FOR USE WITH THE PL/I OPTIMIZING COMPILER. HOWEVER, THEY WILL COMPILE AND RUN USING PL/I (P). ALSO, THE INTERFACE ROUTINES MAY BE GENERATED FOR USE WITH EITHER VERSION OF THE PL/I COMPILER.

5. NO SPECIAL ACCESS METHODS OR APPENDAGES ARE NEEDED FOR BIAS. ALL I/O IS PERFORMED THROUGH QSAM, BSAM, BPAM AND BDAM.
6. THE AMOUNT OF CORE REQUIRED FOR BIAS DEPENDS ON GENERATION PARAMETERS, SUCH AS MAXIMUM RECORD SIZE AND MAXIMUM NUMBER OF SIMULTANEOUS USERS. PRACTICAL MINIMA ARE 52K EACH FOR THE FILER AND TP PROGRAM AND 100K FOR BOOLRET.

ABOUT 350 PAGES OF DOCUMENTATION (MACHINE-READABLE), BOTH USER AND SYSTEM, IS PROVIDED WITH BIAS.

BIAS HAS BEEN RUNNING FOR PRODUCTION AT BAYLOR FOR A YEAR AND A HALF. THERE ARE CURRENTLY ABOUT 30 DATA CLASSES IN USE, TOTALING 200,000 RECCRDS AND 24,000,000 BYTES OF DATA.

PROGRAMMING LANGUAGE - ASSEMBLER AND PL/I

MINIMUM SYSTEM REQUIREMENTS - SEE DESCRIPTION

DOCUMENTATION: 8 PAGES, NO ADDITIONAL CHARGE.

(PLUS MACHINE READABLE DOCUMENTATION)

CARD COUNT: NOT AVAILABLE ON CARDS.

SUBMITTAL/REVISION DATE: 12/75

REQUIRES 1200 FT. TAPE FOR DISTRIBUTION AT 800 BPI.

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360D-06.7.028

SELECT PROGRAM

AUTHORS: DORON STEGER & GUNNAR GRUVAEUS

DIRECT TECHNICAL INQUIRIES TO:

DORON STEGER OR GUNNAR GRUVAEUS

HOECHST-ROUSSEL PHARMACEUTICALS, INC.

ROUTE 202-206 NORTH

SOMERVILLE, NJ 08876

DESCRIPTION - IN CASES WHERE MANY PROGRAMS MAKE USE OF THE SAME DATA, IT IS AS A RULE BOTH DIFFICULT AND EXPENSIVE TO

CONTINUED FROM PRIOR COLUMN

MAINTAIN A SEPARATE DATA FILE FOR EACH PROGRAM AND INSTEAD ONLY A COMPLETE DATA FILE IS MADE AVAILABLE. THE SELECT PROGRAM WAS DESIGNED TO ACT AS AN INTERFACE BETWEEN SUCH A DATA STRUCTURE AND PROGRAMS THAT WILL ANALYZE THIS DATA. SELECT LOGICALLY PARTITIONS ANY FIXED LENGTH RECORD SEQUENTIAL FILE ACCORDING TO USER SPECIFICATIONS AND THEN SELECTS THOSE PORTIONS OF DATA WHICH ARE SPECIFIC TO THE REQUIREMENTS OF THE USER PROGRAM. SELECT ALSO PROVIDES COUNTS OF VARIOUS BREAKDOWNS OF THE DATA (NUMBER OF GROUPS, NUMBER OF CASES IN EACH GROUP, ETC.). THE USER DESCRIBES FIELDS USED BY SELECT BY SUPPLYING POSITION AND LENGTH OF THE FIELD WITHIN THE DATA, THUS ELIMINATING THE NEED FOR A DATA BASE DICTIONARY.

PROGRAMMING LANGUAGE - FORTRAN G OR PL/I

MINIMUM SYSTEM REQUIREMENTS - 90K AND A FORTRAN IV OR PL/I COMPILER

DOCUMENTATION: MACHINE READABLE DOCUMENTATION ONLY.  
CARD COUNT: NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 11/76

360D-06.8.002  
LPI

AUTHOR: D. RITCHIE

DIRECT TECHNICAL INQUIRIES TO:  
DEAN RITCHIE  
COMPUTING CENTER  
WASHINGTON STATE UNIVERSITY  
PULLMAN, WASHINGTON 99163

DESCRIPTION - LPI IS A SMALL SET OF SUBPROGRAMS FOR USE BY FORTRAN PROGRAMMERS TO PERFORM THE BASIC FUNCTIONS OF LIST PROCESSING. THIS PAPER DESCRIBES AND EVALUATES LPI, COMPARING IT SPECIFICALLY WITH SLIP, A SIMILAR SYSTEM.

PROGRAMMING SYSTEMS - OPERATES UNDER OS/360.

MINIMUM SYSTEM REQUIREMENTS - LPI REQUIRES ONLY SUFFICIENT HARDWARE TO COMPILE AND EXECUTE FORTRAN PROGRAMS.

DOCUMENTATION: 22 PAGES, \$.10 ADDITIONAL CHARGE.  
CARD COUNT: 250 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 06/69.

360D-06.8.003  
THE DATA STRUCTURES PROGRAMMING SYSTEM

AUTHOR: F.W. TOMPA

DIRECT TECHNICAL INQUIRIES TO:  
F.W. TOMPA  
CENTER FOR COMPUTER & INFORMATION SCIENCES  
182 GEORGE STREET  
PROVIDENCE, R.I. 02912

DESCRIPTION - THE DATA STRUCTURES PROGRAMMING SYSTEM (DSPS) ALLOWS A USER TO BUILD AND MANIPULATE COMPLEX DATA (LIST) STRUCTURES. THE STRUCTURES, WRITTEN IN THE DATA STRUCTURES PROGRAMMING LANGUAGE (DSPL) AND TRANSLATED INTO ASSEMBLER LANGUAGE BY A COMPILER, ARE DESIGNED COMPLETELY BY THE USER IN ORDER THAT THEY MAY BEST FIT HIS PARTICULAR APPLICATION. THE RUN-TIME PAGING COMPONENT PERMITS THE STRUCTURE TO BE ARBITRARILY LARGE WHILE IMPOSING ONLY MINIMAL MANIPULATION HANDICAPS ON THE USER.

USERS OF DSPS INCLUDE THOSE WHO NEED TO DESIGN POWERFUL DATA STRUCTURES OPTIMIZED FOR RUN-TIME SPEED. DSPL IS COMPLETELY COMPATIBLE WITH ASSEMBLER LANGUAGE IN ORDER TO PERMIT A USER TO CONVENIENTLY INTERMIX SIMPLE ARITHMETICS, SHIFTS, ETC. FOR MANIPULATING DATA.

MINIMUM SYSTEM REQUIREMENTS - DSPS WAS WRITTEN FOR A SYSTEM/360 MODEL 50 OR HIGHER, USING 2314 OR 2311 DIRECT ACCESS DEVICES (DISKS) FOR SECONDARY STORAGE.

PROGRAMMING SYSTEMS - IT HAS BEEN RUN UNDER RELEASES 14, 15/16, AND 17 OF THE 360 OPERATING SYSTEM, USING BOTH MVT AND MFT. THE PROGRAM IS WRITTEN IN SYSTEM/360 ASSEMBLER LANGUAGE AND HAS BEEN TESTED UNDER IEM'S ASSEMBLER F AND WATERLOO'S ASSEMBLER G.

DOCUMENTATION: 31 PAGES, \$.55 ADDITIONAL CHARGE.  
CARD COUNT: 10,450 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 01/69

360D-06.8.004

IN-CORE STACK MANIPULATION FOR OS/360 ASSEMBLER  
LANGUAGE PROGRAMS

AUTHOR: ROGER J CHETWYND

DIRECT TECHNICAL INQUIRIES TO:  
ROGER J CHETWYND  
COMPUTER SCIENCE DEPARTMENT  
UNIVERSITY OF MONTANA  
MISSOULA, MONTANA 59801

DESCRIPTION - WSUSTACK IS A RE-ENTERABLE SUBPROGRAM WHICH DYNAMICALLY CREATES AND MAINTAINS CORE-RESIDENT STACKS IN AN OS/360 ASSEMBLER LANGUAGE ENVIRONMENT. IT MAY BE ASSEMBLED AND USED ON AN IBM S/360 UNDER ANY VERSION OF OS SINCE RELEASE 14.

STACK LENGTHS ARE LIMITED ONLY BY THE MAIN STORAGE AVAILABLE TO THE TASK, THE SIZE OF THE STACK NODE MAY VARY FROM 1 TO 256 BYTES AND IS CONSTANT FOR A GIVEN STACK, AND ANY NUMBER OF STACKS MAY BE MAINTAINED CONCURRENTLY.

AS ONE OF THE DESIGN OBJECTIVES WAS OPTIMIZATION OF STORAGE AND EXECUTION TIME, THE CALLING SEQUENCES ARE NON-STANDARD. ACCORDINGLY A COMPANION SET OF MACRO INSTRUCTIONS IS PROVIDED TO GENERATE THE PROPER CALLING SEQUENCES. THE FUNCTIONS AVAILABLE, EACH OF WHICH IS CALLED BY A CORRESPONDING MACRO INSTRUCTION, ARE: ALLOCATE AND INITIALIZE STACK, DELETE STACK, STACK A NODE, UNSTACK A NODE, RESET STACK TO THE EMPTY CONDITION, INDEX STACK (LOCATE N'TH NODE), SEARCH STACK (LOCATE A NODE SATISFYING GIVEN CONDITIONS).

PROGRAMMING LANGUAGE - ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - OS/360

DOCUMENTATION: 26 PAGES, \$.30 ADDITIONAL CHARGE.  
CARD COUNT: 600 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 8/73.

360D-08.0.003

WRIMAT MATRIX WRITER

AUTHORS: R. A. USANIS H. E. SCHAFFER

DIRECT TECHNICAL INQUIRIES TO:  
DR. R. A. USANIS  
DIRECTOR, COMPUTING CENTER  
POST OFFICE BOX 5445  
N. C. STATE UNIVERSITY  
RALEIGH, NORTH CAROLINA 27607

DESCRIPTION - THIS SUBROUTINE PRINTS LARGE MATRICES IN EASILY READABLE FORM. GIVEN A MATRIX STORED IN SINGLY OR DOUBLY SUBSCRIPTED FORM, SUBROUTINE WRIMAT WILL PRINT THE MATRIX IN RECTANGULAR, UPPER TRIANGULAR, OR LOWER TRIANGULAR FORM DEPENDING ON THE ARGUMENTS PASSED FROM THE CALLING PROGRAM. THE OUTPUT IS DIVIDED INTO PAGES WITH A MAXIMUM OF NINE COLUMNS AND 27 ROWS PER PAGE. EACH PAGE IS TITLED, THE ROWS AND COLUMNS ARE NUMBERED AND THE ROWS ARE DOUBLE SPACED. TRIANGULAR MATRICES CAN BE PRINTED ONLY AS STORED AND ARE PRINTED WITH THEIR MAIN DIAGONAL. THE OUTPUT FOR ANY SHAPE MATRIX WILL BE SUCH THAT THE PAGES CAN BE ARRANGED TOGETHER TO FORM THE ENTIRE MATRIX.

PROGRAMMING SYSTEMS - WRITTEN IN FORTRAN IV G AND TESTED ON RELEASE 11 AND 14 OF OS/360.

MINIMUM SYSTEM REQUIREMENTS - SAME AS THCSF REQUIRED FOR OS/360. USES APPROXIMATELY 3330 BYTES OF MEMORY. A MAXIMUM OF 132 PRINT POSITIONS ARE USED.

DOCUMENTATION: 8 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 300 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 09/69

360D-08.6.001

PLOTS - A SUBROUTINE FOR TIME-SERIES PLOTTING ON A PRINTER

AUTHOR: MR. R. H. KARPINSKI

DIRECT TECHNICAL INQUIRIES TO:

MR. R. H. KARPINSKI  
 INFORMATION SYSTEMS, 76-U  
 UNIVERSITY OF CALIFORNIA  
 SAN FRANCISCO, CA 94143

DESCRIPTION - TO USE "PLOTS" TO PLOT N CURVES - CALL PLOTS (-N, RANGES) WHERE N EQUALS NUMBER OF CURVES (THIS ARGUMENT SHOULD BE NEGATIVE FOR THE SETUP CALL, CAUSING A NEW PLOT TO BE STARTED), AND RANGES EQUALS AN ARRAY OF SIZE 3N PLUS 3:

- RANGES (1) - TIME ZERO (TIME OF BEGINNING OF PLOT).
- RANGES (2) - DELTA TIME (TIME INCREMENT PER PLOT LINE).
- RANGES (3) - 1 (TIME WILL BE PRINTED EVERY 1 LINES, UNLESS 1 IS LESS THAN ZERO).
- RANGES (4) - X(1)MIN. (MINIMUM VALUE TO BE PLOTTED FOR FIRST CURVE).
- RANGES (5) - X(1)MAX. (MAXIMUM VALUE TO BE PLOTTED FOR FIRST CURVE).
- RANGES (6) - X(1)CHAR. (CHARACTER TO BE PLOTTED TO INDICATE FIRST CURVE).
- RANGES (3N PLUS 1) - X(N) MIN.
- RANGES (3N PLUS 2) - X(N) MAX.
- RANGES (3N PLUS 3) - X(N) CHAR.

FOR EACH LINE DESIRED (I.E. CALL "PLOTS" MANY TIMES ONCE FOR EACH TIME INCREMENT), CALL PLOTS (N,X) WHERE N EQUALS THE NUMBER OF CURVES AND X(I) EQUALS THE CURRENT VALUE OF THE ITH CURVE. "PLOTS" WILL ACTUALLY PLOT A VALUE UP TO, BUT NOT INCLUDING, MAX. PLUS (MAX-MIN) \*0.01 IN THE 101ST POSITION. N SHOULD BE BETWEEN 1 AND 100.

PROGRAMMING SYSTEMS - WRITTEN IN FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED FOR OS/360.

DOCUMENTATION: 6 PAGES, NO ADDITIONAL CHARGE.

CARD COUNT: 100 APPROXIMATE.

SUBMITTAL/REVISION DATE: 02/67

360D-08.6.002

INTERFACE BETWEEN PL/I USER PROGRAMS AND CALCOMP ROUTINES

AUTHOR: MR. E. H. REMY

DIRECT TECHNICAL INQUIRIES TO:

MR. E. H. REMY  
 EASTMAN KODAK CO.  
 BLDG. 56, KODAK PARK  
 ROCHESTER, NEW YORK 14650

DESCRIPTION - THE OS/360 PLOTTING ROUTINES PROVIDED BY CALCOMP ARE WRITTEN IN FORTRAN AND ASSEMBLER AND ARE DESIGNED TO BE USED BY A FORTRAN PROGRAM. THESE ROUTINES MAY BE CALLED BY A PL/I PROGRAM BUT SUCH USE DOES NOT PERMIT SOME COMMONLY USED PL/I FEATURES SUCH AS CHARACTER STRINGS. IT IS ALSO AN INCONVENIENCE FOR A PL/I PROGRAMMER TO ADHERE TO FORTRAN LINKAGE CONVENTIONS SUCH AS AVOIDING PASSING DOPE VECTORS. TO PERMIT THE PL/I PROGRAMMER TO USE STRAIGHT-FORWARD PL/I STATEMENTS IN PLOT PROGRAMS, THIS INTERFACE HAS BEEN WRITTEN TO INTERCEPT THE LINKAGE BETWEEN THE USER'S PROGRAM AND THE ROUTINES PROVIDED BY CALCOMP. LINKAGE EDITOR "CHANGE" CARDS ARE USED TO PERMIT THE INTERFACE TO HAVE ENTRY POINTS WITH THE SAME NAMES AS THE ROUTINES PROVIDED BY CALCOMP. THE JCL MAY BE MODIFIED TO CONFORM TO AN INSTALLATION'S PROCEDURES AND NAMING CONVENTIONS.

PROGRAMMING SYSTEMS - WRITTEN IN FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED FOR OS/360.

DOCUMENTATION: 14 PAGES, NO ADDITIONAL CHARGE.

CARD COUNT: 200 APPROXIMATE.

SUBMITTAL/REVISION DATE: NOT KNOWN

CONTINUED FROM PRIOR COLUMN

360D-08.6.003

PLOT - A SUBROUTINE FOR PLOTTING ON A PRINTER

AUTHOR: MR. L. ISRAEL

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
NOT CURRENTLY AVAILABLE.DESCRIPTION - THE SUBROUTINE PLOT IS USED FOR PLOTTING  
ON A PRINTER. IT WILL PRINT ONE TO NINE SETS OF DEPENDENT  
VARIABLES AGAINST AN INDEPENDENT VARIABLE, AND/OR A CURVE  
OF CALCULATED VALUES.

PROGRAMMING SYSTEMS - WRITTEN IN BASIC FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED FOR OS/360.

DOCUMENTATION: 18 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 250 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 10/67S. GIULIERI. IT IS COMPATIBLE WITH FORTRAN H, HOWEVER,  
IT HAS ONLY BEEN CHECKED OUT ON FORTRAN G.

PROGRAMMING SYSTEMS - WRITTEN IN FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - THE PROGRAM WAS RUN ON AN  
IBM 360-IH65 USING LESS THAN 270K.DOCUMENTATION: 46 PAGES, \$1.30 ADDITIONAL CHARGE.  
CARD COUNT: 2,000 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 08/69

360D-08.6.012

PRG, PERSPECTIVE PLOTTING ROUTINE, RECTANGULAR GRID

AUTHOR: B KUBERT

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
NOT CURRENTLY AVAILABLE.DESCRIPTION - PRG IS AN OS/360 FORTRAN SUBROUTINE WHICH  
GENERATES PERSPECTIVE PLOTS OF CURVES AND SURFACES. THE  
SURFACES REPRESENT FUNCTIONS OF TWO VARIABLES,  $F(X,Y)$ ,  
WHICH SATISFY CERTAIN RESTRICTIONS. THE PLOT OF A SURFACE  
IS CONSTRUCTED FROM TWO FAMILIES OF CURVES ON THE SURFACE,  
ONE FAMILY HAVING CURVES ON THE SURFACE, ONE FAMILY HAVING  
CURVES WITH FIXED X COORDINATES, THE OTHER FAMILY HAVING  
CURVES WITH FIXED Y COORDINATES. THE PLOTTING OF THE  
LATTER CAN BE SUPPRESSED. THE SURFACES CAN BE ROTATED  
OR TRANSLATED. AS AN OPTION THE SURFACES MAY BE TAKEN  
TO BE OPAQUE, IN WHICH CASE ALL HIDDEN LINES ARE ELIMINATED.  
THE INPUT DATA FOR THE SURFACE IS GIVEN IN FIVE ARRAYS  
WHICH CONTAIN THE STARTING X AND Y VALUES, THE X AND Y  
INCREMENTS AND THE Z VALUES. THE INPUT DATA FOR A CURVE  
IS A SET OF CONSECUTIVE POINTS LYING ON THE CURVE. THIS  
PROGRAM REPLACED PRG (D003A). THIS SUBROUTINE IS A  
MODIFICATION OF A PROGRAM ORIGINALLY WRITTEN BY J. SZABO  
AND S. GIULIERI. IT IS COMPATIBLE WITH FORTRAN H, HOWEVER,  
IT HAS ONLY BEEN CHECKED OUT ON FORTRAN G.

PROGRAMMING SYSTEMS - WRITTEN IN OS/360 FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - THE PROGRAM WAS RUN ON AN  
IBM 360-IH65 USING LESS THAN 270K.

360D-08.6.011

PNRG, PERSPECTIVE PLOTTING ROUTINE, ARBITRARY GRID

AUTHOR: B. KUBERT

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
CURRENTLY NOT AVAILABLE.DESCRIPTION - THIS SUBROUTINE GENERATES PERSPECTIVE PLOTS  
OF CURVES AND SURFACES. THE SURFACES REPRESENT FUNCTIONS  
OF TWO VARIABLES,  $F(X,Y)$ , WHICH SATISFY CERTAIN  
RESTRICTIONS. AS AN OPTION THE SURFACES MAY BE TAKEN TO  
BE OPAQUE, IN WHICH CASE ALL HIDDEN LINES ARE ELIMINATED.  
THE INPUT DATA FOR A SURFACE ARE THE MESH POINTS OF TWO  
FAMILIES OF CURVES LYING ON THE SURFACE. THEY ARE GIVEN  
IN THREE ARRAYS, ONE CONTAINING X-COORDINATES, ONE  
CONTAINING Y-COORDINATES, AND THE OTHER CONTAINING Z-  
COORDINATES OF THE MESH POINTS. THE INPUT DATA FOR A CURVE  
IS A SET OF CONSECUTIVE POINTS LYING ON THE CURVE. PNRG  
IS A MODIFICATION OF A SUBROUTINE WRITTEN BY J. SZABO AND

CONTINUED FROM PRIOR COLUMN

DOCUMENTATION: 31 PAGES, \$.55 ADDITIONAL CHARGE.  
 CARD COUNT: 1,450 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 08/69

360D-08.7.003  
 HISTOGRAM DISPLAY SUBROUTINE

AUTHOR: D. ASHLER

DIRECT TECHNICAL INQUIRIES TO:

DR. D. ASHLER  
 OFFICE OF RESEARCH AND EVALUATION  
 ROOM 400  
 SCHOOL DISTRICT OF PHILADELPHIA  
 21ST ST. AND BENJ. FRANKLIN PARKWAY  
 PHILADELPHIA, PA 19103

DESCRIPTION - SUBROUTINE HIST MAY BE CALLED TO OBTAIN THE MEAN, STANDARD DEVIATION, QUANTILES, AND A HISTOGRAM OF A DISTRIBUTION. THE CALL MUST SUPPLY THE NAME AND THE LENGTH OF A ONE-DIMENSIONAL ARRAY OF REAL\*4 NUMBERS; HIST SORTS THESE NUMBERS IN PLACE, SUBDIVIDES THEIR RANGE INTO FOURTEEN EQUAL INTERVALS, AND PRINTS A 14-BAR HISTOGRAM ON A SINGLE PAGE. THE MEAN AND THE QUANTILE BOUNDARIES ARE MARKED ON THE HISTOGRAM. THE VALUES OF THE FOURTEEN FREQUENCIES ARE PRINTED ABOVE IT, THE VALUES OF THE INTERVAL BOUNDARIES AND OF THE MEAN, QUANTILE BOUNDARIES, AND THE STANDARD DEVIATION ARE PRINTED BELOW IT. PROVISION IS ALSO MADE FOR DISPLAYING A LEGEND AT THE BOTTOM OF THE PAGE AND IN THE UPPER LEFT CORNER.

PROGRAMMING SYSTEMS - UTILIZES OS/360.

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED FOR OS/360.

DOCUMENTATION: 14 PAGES, NO ADDITIONAL CHARGE.  
 CARD COUNT: 300 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 04/68

360D-08.6.013  
 PLT360, IBM 1627 PLOTTING ROUTINE

AUTHOR: MAUREEN CLARK

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
 CURRENTLY NOT AVAILABLE.

DESCRIPTION - THIS ROUTINE WILL PLOT FROM ONE TO SEVEN DEPENDENT VARIABLES VS. AN INDEPENDENT VARIABLE FROM USER-SUPPLIED INFORMATION. PLT360 IS ON THE S/360 LIBRARY. ALL CALLS FROM FORTRAN ARE TO PLT. SUBROUTINES PLT1 AND PLTW ARE CALLED BY PLT. PLT360 IS THE OS/360 ASSEMBLER LANGUAGE VERSION OF THE 7040-7094 DCS ROUTINES PLT(AM01B), PLT1(AM10A), AND PLTW(AM11A), WHICH WERE MAJOR REVISIONS OF RW CCP AND RW CCP2, WRITTEN BY K. G. TOMIKAWA AND J. R. BLACKMER, RESPECTIVELY, IN AUGUST OF 1962, AT SPACE TECHNOLOGY LABORATORIES, REDONDO BEACH, CALIFORNIA.

PROGRAMMING SYSTEMS - WRITTEN IN OS/360 ASSEMBLER LANGUAGE.

MINIMUM SYSTEM REQUIREMENTS - TOTAL STORAGE REQUIRED (BYTES) IS 236C(16) OR 9046(10). THIS PROGRAM WAS RUN ON AN IEM 360-IH65.

DOCUMENTATION: 52 PAGES, \$1.60 ADDITIONAL CHARGE.  
 CARD COUNT: 2,300 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 08/69



360D-08.7.004

INTERSECTION DETECTION IN THREE DIMENSIONS - A TOOL FOR  
COMPUTER AIDED ENGINEERING DESIGN AND GRAPHIC DISPLAY

AUTHOR: P. G. COMBA

DIRECT TECHNICAL INQUIRIES TO:

DR. P. G. COMBA  
IBM CORPORATION  
CAMBRIDGE SCIENTIFIC CENTER  
545 TECHNOLOGY SQUARE  
CAMBRIDGE, MA 02139

DESCRIPTION - THE INTERSECTION DETECTION PROGRAM (ID/3D)  
IS A SYSTEM OF FORTRAN SUBROUTINES THAT ENABLES THE USER  
TO - DEFINE 3-DIMENSIONAL CONVEX OBJECTS BOUNDED BY PLANES  
AND QUADRIC SURFACES - DEFINE LINE SEGMENTS IN 3-SPACE  
- TEST FOR INTERSECTIONS BETWEEN PAIRS OF OBJECTS - TEST  
FOR INTERSECTIONS BETWEEN SEGMENTS AND OBJECTS. THE PROGRAM  
IS PRIMARILY A TOOL FOR THE SOLUTION OF PIPE ROUTING AND  
COMPONENT PLACEMENT PROBLEMS. THE SEGMENT-OBJECT  
INTERSECTION TEST CAN ALSO BE USED TO SOLVE THE HIDDEN  
LINE PROBLEM IN COMPUTING GRAPHIC DISPLAYS OF 3-DIMENSIONAL  
OBJECTS.

PROGRAMMING SYSTEMS - CAN RUN UNDER OS/360 OR BPS.

MINIMUM SYSTEM REQUIREMENTS - REQUIRES 128K CORE STORAGE.  
(NOTE- THE AMOUNT OF CORE NEEDED FOR COMPILATION AND LINKAGE  
EDITING DEPENDS ON THE VERSION OF THE COMPILER AND LINKAGE  
EDITOR BEING USED. THE PROGRAM HAS BEEN COMPILED AND  
TESTED UNDER BPS WITH 128K STORAGE, AND UNDER OS FORTRAN  
G AND FORTRAN H LEVELS WITH 512K STORAGE).

DOCUMENTATION: 59 PAGES, \$1.95 ADDITIONAL CHARGE.  
CARD COUNT: 3,000 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 12/67

360D-08.7.006

SPLOT - ONE PAGE GRAPH-PRINTING SUBROUTINE

AUTHOR: D. ASHLER

DIRECT TECHNICAL INQUIRIES TO:

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OFFICE OF RESEARCH AND EVALUATION  
ROOM 400  
SCHOOL DISTRICT OF PHILADELPHIA  
21ST ST. AND BENJ. FRANKLIN PARKWAY  
PHILADELPHIA, PA 19103

DESCRIPTION - SUBROUTINE SPLOT CONSTRUCTS AND PRINTS A  
ONE-PAGE GRAPH ON A PRINTER, E.G., IBM 1403, THAT IS  
NORMALLY SET UP TO PRINT TEN CHARACTERS PER INCH  
HORIZONTALLY, 132 CHARACTERS PER LINE, AT A VERTICAL LINE  
SPACING OF SIX LINES PER INCH. MULTIPLE ENTRIES ARE USED  
TO PROVIDE MAXIMUM FLEXIBILITY. AN AREA OF MEMORY SIMULATES  
THE GRAPH PAPER. IT IS INITIALIZED TO ALL BLANKS. MAXIMUM  
AND MINIMUM VALUES OF THE TWO VARIABLES ARE SUPPLIED FOR  
SCALING PURPOSES. POINTS ARE PLOTTED BY REPLACING THE  
BLANKS WITH ANY DESIRED CHARACTERS. WHEN THE GRAPH IS  
COMPLETE, A CALL TO GRAPH PRINTS IT OUT, TOGETHER WITH  
LEGENDS AT BOTTOM AND AT UPPER LEFT IF DESIRED. A SET  
OF POINTS TO BE PLOTTED IS SUPPLIED IN THE FORM OF TWO  
ARRAYS, ONE OF ABSCISSAS AND ONE OF ORDINATES, SEVERAL  
SETS OF POINTS MAY BE PLOTTED, EACH SET WITH A DIFFERENT  
CHARACTER. IF DESIRED, THE POINTS WILL BE PRINTED OUT  
SUPERIMPOSED ON A GRID, OR ENCLOSED IN A BOX, WITH SCALE  
VALUES PRINTED ALONG THE LEFT EDGE AND BOTTOM. AXES ARE  
ALSO OPTIONAL. COORDINATES MAY BE SUPPLIED IN SINGLE OR  
DOUBLE PRECISION. SPLOT MAY BE USED TO PRINT PICTURES;  
GRAPHS OF EQUATIONS, SCATTERGRAMS, ETC., HOWEVER, FOR  
HISTOGRAMS, HIST IS RECOMMENDED.

PROGRAMMING SYSTEMS - RUNS UNDER OS/360.

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED FOR OS/360.

DOCUMENTATION: 8 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 500 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 04/68

360D-11.3.015

COMMERCIAL FEATURE EMULATOR FOR SYSTEM/360 MODEL 44

AUTHOR: ERIC F. BRUBAKER

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
CURRENTLY NOT AVAILABLE.

DESCRIPTION - THE COMMERCIAL FEATURE FOR THE S/360 MODEL 44 PROVIDES A PROGRAM TO EMULATE THE S/360 INSTRUCTIONS NOT IMPLEMENTED IN HARDWARE. THIS PROGRAM REPLACES THE IBM LEVEL G EMULATOR. THE NEW EMULATOR, DESIGNATED G1, HAS BEEN WRITTEN TO INCREASE EMULATION SPEED. IT WILL NORMALLY PROVIDE AT LEAST A 15% TO 20% REDUCTION IN PROCESSING TIME FOR A MAINLINE (NON-44) PROGRAM. THIS AMOUNT VARIES, OF COURSE, ACCORDING TO THE INSTRUCTION MIX (COBOL MAY BE FASTER, PL/I NOT SO MUCH, DEPENDING UPON THE ACTUAL CODE GENERATED.) THE G1 EMULATOR SUPPORTS STORAGE PROTECTION AND ASCII MODE ARITHMETIC AS OPTIONS, ALLOWING A SLIGHT IMPROVEMENT IF THESE FEATURES ARE NOT DESIRED. THE PROGRAM INCLUDES A CHANNEL LOADER TO BOOTSTRAP IT INTO THE STORAGE EXTENSION, AND IS WRITTEN IN ASSEMBLY LANGUAGE.

THE G1 EMULATOR ENTERED TESTING IN SEPTEMBER 1972. SINCE THAT DATE, TEST SITES HAVE REPORTED PERFORMANCE GAINS RANGING FROM SLIGHTLY UNDER 10% TO OVER 30% ON PARTICULAR JOBS. REPORTS OF OVERALL SYSTEM PERFORMANCE UNDER G1 HAVE BEEN QUITE SATISFYING.

PROGRAMMING LANGUAGE - ASSEMBLY

MINIMUM SYSTEM REQUIREMENTS - S/360 MODEL 44

DOCUMENTATION: 5 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 2585 CARDS APPROXIMATE.  
SUBMITTAL/REVISION DATE: 3/73

360D-11.4.002

DCALC

AUTHOR: R. F. ROSIN

DIRECT TECHNICAL INQUIRIES TO:

MR. RICHARD CSGOOD  
YALE COMPUTER CENTER  
175 WHITNEY AVE.  
NEW HAVEN, CCNN. 06520

DESCRIPTION - THE PURPOSE OF DCALC IS TO PROVIDE AN INTERACTIVE DESK-CALCULATOR FACILITY UNDER OS IN AN ENVIRONMENT SUPPORTING 2741'S AND OTHER INTERACTIVE DEVICES. THE CHARACTER STRINGS IN LINES 80-138 OF THE LISTING DESCRIBE ITS USE, AND SHOW HOW IT IS MUCH MORE THAN A SIMPLE DESK-CALCULATOR. DCALC USES SYSIN AND SYSPRINT FOR ALL I/O.

PROGRAMMING SYSTEMS - WRITTEN IN PL/I.

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED TO RUN S/360 OS.

DOCUMENTATION: 23 PAGES, \$.15 ADDITIONAL CHARGE.  
CARD COUNT: 550 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 05/68

360D-12.0.003

SIFT BCD CODES TO EBC AND DIAGNOSE FORTRAN IV CONVERSION PROBLEMS UNDER OS/360

AUTHOR: D. JACOBS

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
CURRENTLY NOT AVAILABLE.

DESCRIPTION - THIS PROGRAM SIFTS BCD CODES INTO EBC AS WELL AS DIAGNOSING CERTAIN CONVERSION PROBLEMS WHICH A FORTRAN IV PROGRAM WILL HAVE UPON CONVERTING TO THE 360. THE PROBLEMS WHICH ARE DIAGNOSED ARE -

- ALL FORMAT STATEMENTS CONTAINING "A5 FORMATS", OR GREATER FLAGGED WITH AN "A". ALL FORMAT STATEMENTS

CONTINUED FROM PRIOR COLUMN

CONTAINING "O FORMATS" ARE FLAGGED WITH AN "O". AT THE END OF EACH ROUTINE (END INDICATED BY AN "END CARD"), A REFERENCE TABLE IS PRODUCED INDICATING THE LOCATION OF EVERY FORMAT STATEMENT (BY ISM) AND THE LOCATION OF THEIR RESPECTIVE READ/WRITE STATEMENTS (BY ISN).

- EVERY BINARY READ/WRITE STATEMENT IS FLAGGED WITH A "B".
- EVERY CALL TO A SUBROUTINE WHICH IS NOT IN THE SUBROUTINE LIBRARY IS FLAGGED WITH A "C". THE STANDARD SUBROUTINE LIST IS COMPILED BY THE USER AND PUT IN A SEQUENTIAL DATA SET. A REFERENCE TABLE OF CALLED SUBROUTINES AND WHETHER OR NOT THEY ARE FLAGGED IS PRODUCED AFTER THE FORMAT/READ/WRITE REFERENCE TABLE.

PROGRAMMING SYSTEMS - WRITTEN IN ASSEMBLER LANGUAGE.

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED FOR OS/360.

DOCUMENTATION: 31 PAGES, \$.55 ADDITIONAL CHARGE.  
CARD COUNT: 700 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 11/66

360D-12.1.024

INTERACTIVE HEX DECIMAL OCTAL CALCULATOR

AUTHOR: D. K. SAKAGUCHI

DIRECT TECHNICAL INQUIRIES TO:  
DR. DIANE K. SAKAGUCHI  
THE AEROSPACE CORPORATION  
P. O. BOX 92957  
LOS ANGELES, CA 90009

DESCRIPTION - THE PROGRAM PROVIDES TSO WITH A CALCULATOR MODE WHICH WILL ACCEPT HEXADECIMAL, OCTAL, OR DECIMAL INTEGERS. IT REQUIRES NO KNOWLEDGE TO USE, AND HAS GOOD RESPONSE TIME. IT IS MEANT TO BE USED TO HELP READ DUMPS, WORK WITH THE TEST COMMAND TO CHECK OUT PROGRAMS, PROVIDE A METHOD FOR COMPOSING HEX TO OCTAL TAPE CONVERSIONS, AND AID IN SIMILAR TASKS WHERE OCTAL OR HEX NUMBERS ARE REQUIRED.

PROGRAMMING LANGUAGE - PL/I

MINIMUM SYSTEM REQUIREMENTS - OS/360, TSO.

DOCUMENTATION: 6 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 150 APPROXIMATE.

CONTINUED FROM PRIOR COLUMN

SUBMITTAL/REVISION DATE: 4/74.

360D-12.2.002

FORTRAN IV TO PL/I TRANSLATOR

AUTHOR: L. M. LEACH

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
CURRENTLY NOT AVAILABLE

DESCRIPTION - THIS PROGRAM TRANSLATES FORTRAN IV AS STANDARDIZED BY THE AMERICAN STANDARDS ASSOCIATION (COMMUNICATIONS OF THE ACM, OCT., 1964) TO PL/I AS DEFINED BY THE IBM PL/I SPECIFICATIONS (FORM C28-6571). THE TRANSLATOR IS WRITTEN IN PL/I AND USES THE METHOD OF RECURSIVE DESCENT TO ACCOMPLISH THE TRANSLATION. THE TRANSLATOR PRODUCES READABLE PL/I OUTPUT THAT REQUIRES MINIMUM PROGRAMMER EFFORT TO OBTAIN A PERFECT TRANSLATION. FORTRAN IS ASSUMED TO HAVE RESERVED WORDS WITH SIGNIFICANT BLANKS. DATA, EQUIVALENCE, AND BACKSPACE STATEMENTS ARE NOT TRANSLATED. THE TRANSLATOR IS WRITTEN IN A WAY TO MAKE IT EASILY MODIFIABLE TO INCLUDE ADDITIONAL FORTRAN STATEMENTS OR ACCEPT A PARTICULAR INSTALLATION VERSION OF FORTRAN IV RATHER THAN THE ASA STANDARD.

PROGRAMMING SYSTEM - WRITTEN IN PL/I AND RUNS UNDER THE CONTROL OF OS/360. (REQUIRES PL/I (F) COMPILER).

DOCUMENTATION: 20 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 1,050 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 08/67

CONTINUED FROM PRIOR COLUMN

360D-12.2.010

CDC TO IBM FORTRAN CONVERSION

AUTHOR: GEORGE GORSLINE, JR.

DIRECT TECHNICAL INQUIRIES TO:  
 GEORGE GORSLINE, JR.  
 UNIVERSITY OF TORONTO LIBRARY  
 TORONTO 181, ONTARIO  
 CANADA

DESCRIPTION - CONVERT WILL CHANGE MOST CDC FORTRAN\* STATEMENTS TO COMPATIBLE IBM FORTRAN IV, G LEVEL. IT WAS DESIGNED TO ELIMINATE AS MUCH OF THE HAND-WORK AS POSSIBLE, BUT NOT TO BECOME A FULL-FLEDGED COMPILER. THE PROGRAM LISTS ALL STATEMENTS CHANGED, BOTH THE ORIGINAL AND THE MODIFICATIONS MADE AND PRODUCES FILE OF CONVERTED SOURCE IMAGES READY FOR COMPILATION. COMPILING OF CONVERT WILL PRODUCE COMMENTS LISTING OPTIONS AVAILABLE WHILE SUPPRESSING THE SOURCE LISTING. CONVERT REQUIRES NO SPECIAL SYSTEM FEATURES AND SHOULD RUN ON ANY SNOBOL4 (AT LEAST VER 3.0) SYSTEM.

PROGRAMMING LANGUAGE - SNOBOL4

MINIMUM SYSTEM REQUIREMENTS - ANY SNOBOL4 SYSTEM

DOCUMENTATION: 6 PAGES, NO ADDITIONAL CHARGE.  
 CARD COUNT: 350 CARDS APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 3/73

USING THE MAXIMUM NEIGHBORHOOD METHOD DEVELOPED BY D. W. MARQUARDT. X IS A VECTOR OF INDEPENDENT VARIABLES AND B IS A VECTOR OF PARAMETERS ESTIMATED TO MINIMIZE THE SUM OF SQUARES OF (Y-y).

ANY NUMBER OF PROBLEMS CAN BE PROCESSED IN ONE RUN. REQUIRED PARTIAL DERIVATIVES CAN BE ESTIMATED OR DEFINED IN A USER SUPPLIED ROUTINE. CPTICNS ARE PROVIDED TO CONTROL THE DETAIL OF PRINTED RESULTS, TO OMIT PARAMETERS, TO OBTAIN NONLINEAR CONFIDENCE LIMITS, TO ALLOW USE OF VALUES FROM A PREVIOUS PROBLEM, TO USE EITHER PL/I OR FORTRAN EXTERNAL ROUTINES, AND TO CONSTRAIN SELECTED PARAMETERS.

STORAGE REQUIRED IS PROBLEM DEPENDENT WITH SMALL PROBLEMS RUNNING IN 114K.

THE CURRENT RELEASE IS VERSION 3.2 CONTAINING SEVERAL CHANGES IN SOURCE CODE WHICH CORRECT PROBLEMS ENCOUNTERED WHEN IMPLEMENTING EARLIER VERSIONS WITH THE PL/I OPTIMIZING COMPILER.

PROGRAMMING LANGUAGE - PL/I, OPTIONAL ALP MODULES.

MINIMUM SYSTEM REQUIREMENTS - CS PL/I FCOR OPTIMIZING COMPILERS.

DOCUMENTATION: 45 PAGES, \$1.25 ADDITIONAL CHARGE.  
 CARD COUNT: 1,350 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 6/76

360D-13.4.001

COOLEY-TUKEY FAST FOURIER TRANSFORM

AUTHOR: N. BRENNER

DIRECT TECHNICAL INQUIRIES TO:  
 NORMAN BRENNER  
 3 SUMNER ROAD  
 CAMBRIDGE, MA 02138

DESCRIPTION - SUBROUTINE FOURT (DATA, NN, NDIM, ISIGN, IFORM, WCRK). THE COOLEY-TUKEY FAST FOURIER TRANSFORM IN USASI BASIC FORTRAN. TRANSFORM (K1, K2, ...) EQUALS SUM(DATA (J1, J2, ...) \* EXP (ISIGN\*2\*PI\*SQRT(-1)\*((J1-1)\*(K1-1)) NN(1) PLUS (J2-1)\*(K2-1) NN(2) PLUS...//, SUMMED FOR ALL J1, K1 BETWEEN 1 AND NN(1), J2, K2 BETWEEN 1 AND NN(2), ETC. THERE IS NO LIMIT

360D-13.2.003

NLIN: LEAST-SQUARES ESTIMATION OF NON-LINEAR PARAMETERS

AUTHOR: R. A. USANIS  
 J. A. MIDDLETON

DIRECT TECHNICAL INQUIRIES TO:  
 J. H. FULTON  
 COMPUTING CENTER  
 BOX 5445  
 N. C. STATE UNIVERSITY  
 RALEIGH, N.C. 27607

DESCRIPTION - NLIN IS A PL/I MAIN PROGRAM WHICH FITS THE MODEL  $y=f(X, B)$  TO THE SET OF OBSERVATIONS  $(Y_i, X_i)$   $i=1(1)N$

CONTINUED FROM PRIOR COLUMN

TO THE NUMBER OF SUBSCRIPTS. DATA IS A MULTIDIMENSIONAL COMPLEX ARRAY (I.E., THE REAL AND IMAGINARY PARTS ARE ADJACENT IN STORAGE, SUCH AS FORTRAN IV PLACES THEM). IF ALL IMAGINARY PARTS ARE ZERO (DATA ARE DISGUISED REAL), SET IFORM TO ZERO TO CUT THE RUNNING TIME BY UP TO FORTY PER CENT. OTHERWISE, IFORM EQUALS PLUS 1. THE LENGTHS OF ALL DIMENSIONS ARE STORED IN ARRAY NN, OF LENGTH NDM. THEY MAY BE ANY POSITIVE INTEGERS, THOUGH THE PROGRAM RUNS FASTER ON COMPOSITE INTEGERS, AND ESPECIALLY IF A MINUS 1 TRANSFORM IS FOLLOWED BY A PLUS 1 (OR VICE VERSA) THE ORIGINAL DATA REAPPEAR, MULTIPLIED BY NTOT (EQUALS  $NN(1)*NN(2)*\dots$ ). TRANSFORM VALUES ARE NOT ALWAYS COMPLEX, AND ARE RETURNED IN ARRAY DATA, REPLACING THE INPUT. IN ADDITION, IF ALL DIMENSIONS ARE NOT POWERS OF TWO, ARRAY WORK MUST BE SUPPLIED, COMPLEX OF LENGTH EQUAL TO THE LARGEST NON  $2**K$  DIMENSION. OTHERWISE, REPLACE WORK BY ZERO IN THE CALLING SEQUENCE. NORMAL FORTRAN DATA ORDERING IS EXPECTED, FIRST SUBSCRIPT VARYING FASTEST. ALL SUBSCRIPTS BEGIN AT ONE. RUNNING TIME IS MUCH FASTER THAN THE NAIVE  $NTOT**2$ , BEING PROPORTIONAL TO  $NTOT*(SUM OF THE PRIME FACTORS OF NTOT PLUS CONST*(NUMBER OF FACTORS OTHER THAN TWOS))$ . ACCURACY IS ALSO GREATLY IMPROVED, AS THE RMS RELATIVE ERROR IS BOUNDED BY  $3*2**(-B)*SUM((PRIME FACTOR)**1.5)$ , WHERE B IS THE NUMBER OF BITS IN THE FLOATING POINT FRACTION. THIS IS THE FASTEST AND MOST VERSATILE VERSION OF THE FFT KNOWN TO THE AUTHOR.

PROGRAMMING SYSTEMS - WRITTEN IN USASI BASIC FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - 8K.

DOCUMENTATION: 8 PAGES, NO ADDITIONAL CHARGE.  
 CARD COUNT: 800 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 09/68

360D-13.4.002

COOLEY-TUKEY FAST FOURIER TRANSFORM

AUTHOR: N. BRENNER

DIRECT TECHNICAL INQUIRIES TO:  
 NORMAN BRENNER  
 3 SUMNER ROAD  
 CAMBRIDGE, MA 02138

DESCRIPTION - FAST ON NUMBERS RICH IN FACTORS OF TWO.  
 ISIGN IS PLUS 1 OR MINUS 1. SUBROUTINE FOUR1

CONTINUED FROM PRIOR COLUMN

(DATA, NN, ISIGN). THE COOLEY-TUKEY FAST FOURIER TRANSFORM IN USASI BASIC FORTRAN. TRANSFORM(K) EQUALS  $SUM(DATA(J)*EXP(ISIGN*2*PI*SQRT(-1)*(J-1)*(K-1)/NN))$ , SUMMED OVER ALL J AND K FROM 1 TO NN. DATA IS A ONE-DIMENSIONAL COMPLEX ARRAY (I.E., THE REAL AND IMAGINARY PARTS ARE ADJACENT IN STORAGE, SUCH AS FORTRAN IV PLACES THEM) WHOSE LENGTH NN EQUALS  $2**K$ , K.G.E.O. (IF NECESSARY, APPEND ZEROES TO THE DATA). ISIGN IS PLUS 1 OR MINUS 1. IF A MINUS 1 TRANSFORM IS FOLLOWED BY A PLUS 1 (OR VICE VERSA) THE ORIGINAL DATA REAPPEAR, MULTIPLIED BY NN. TRANSFORM VALUES ARE RETURNED IN ARRAY DATA, REPLACING THE INPUT. THE TIME IS PROPORTIONAL TO  $NN*LOG2(NN)$ , RATHER THAN THE NAIVE  $NN**2$ . ACCURACY IS ALSO GREATLY IMPROVED, THE RMS RELATIVE ERROR BOUNDED BY  $6*SQRT(2)*LOG2(NN)*2**(-B)$ , WHERE B IS THE NUMBER OF BITS IN THE FLOATING POINT FRACTION.

PROGRAMMING SYSTEMS - WRITTEN IN USASI BASIC FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - 8K.

DOCUMENTATION: 3 PAGES, NO ADDITIONAL CHARGE.  
 CARD COUNT: 150 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 09/68

360D-13.6.003

NONLINEAR PARAMETER ESTIMATION AND PROGRAMMING

AUTHOR: YONATHAN BARD

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 IBM CAMBRIDGE SCIENTIFIC CENTER  
 545 TECHNOLOGY SQUARE  
 CAMBRIDGE, MASS. 02139

DESCRIPTION - THE PROGRAM IS DESIGNED TO SOLVE THE FOLLOWING PROBLEMS:

- (1) ESTIMATE UNKNOWN PARAMETERS IN NONLINEAR MATHEMATICAL MODELS, USING ANY OF THE FOLLOWING TECHNIQUES:
  - (A) LEAST SQUARES
  - (B) WEIGHTED LEAST SQUARES
  - (C) MAXIMUM LIKELIHOOD
  - (D) BAYESIAN ESTIMATION

SPECIAL PROVISIONS ARE INCLUDED FOR MODELS INVOLVING SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS, AND FOR

CONTINUED FROM PRIOR COLUMN

CHEMICAL REACTION KINETICS EQUATIONS. CONSTRAINTS MAY BE IMPOSED ON THE PARAMETER VALUES.

- (2) SOLVE NONLINEAR PROGRAMMING PROBLEMS.
- (3) SOLVE SIMULTANEOUS EQUATIONS, TWO POINT BOUNDARY VALUE PROBLEMS, AND OTHER PROBLEMS WHICH CAN BE CAST IN THE FORM OF ONE OF THE TWO ABOVE MENTIONED FORMS.

PROGRAMMING SYSTEMS - THE PROGRAM IS WRITTEN IN THE LOWEST LEVEL FORTRAN IV LANGUAGE.

MINIMUM SYSTEM REQUIREMENTS - IT CAN BE RUN ON THE IEM SYSTEM/360 UNDER THE OS OR BPS MONITORS, ON THE IBM 7090 OR 7094 COMPUTER UNDER IBSYS, ETC.

DOCUMENTATION: 97 PAGES, \$3.85 ADDITIONAL CHARGE.  
CARD COUNT: 2,280 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 12/67

360D-13.6.007

NONLINEAR LEAST-SQUARES CURVE FITTING PROGRAM

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DESCRIPTION - THE PROGRAM ALLOWS THE USER TO ESTIMATE THE COEFFICIENTS OF A NONLINEAR EQUATION SUCH AS

$$Y = A / (X + B) \quad \text{AND} \quad Y = AX + C$$

-- EQUATIONS THAT ARE NONLINEAR IN THE COEFFICIENTS. AN ITERATIVE TECHNIQUE IS USED; THE ESTIMATES AT EACH ITERATION ARE OBTAINED BY MARQUARDT'S MAXIMUM NEIGHBORHOOD METHOD WHICH COMBINES THE GAUSS (TAYLOR SERIES) METHOD AND THE METHOD OF STEEPEST DESCENT.

SINCE NUMEROUS FORMS OF EQUATIONS CAN BE USED, THE USER MUST SPECIFY THE FORM BY PROVIDING A SUBROUTINE TO COMPUTE THE VALUES OF THE EQUATION'S COEFFICIENTS. IN ADDITION, THE USER MUST PROVIDE A CONTROL CARD, A FORMAT CARD FOR READING DATA AND ESTIMATES OF THE STARTING VALUES OF THE

CONTINUED FROM PRIOR COLUMN

COEFFICIENTS. IF DESIRED, INFORMATION CARDS AND COEFFICIENT NAME CARDS CAN BE READ FOR DISPLAY ON THE PRINTOUT. SUCH DISPLAYS ARE HELPFUL TO RECORD THE FORM OF THE EQUATION, THE PURPOSE OF THE RUN AND ANY ADDITIONAL INFORMATION THAT MAY HELP IDENTIFY THE PRINTOUT IN THE FUTURE. IDENTIFICATION OF THE COEFFICIENTS BY NAME IS PARTICULARLY HELPFUL WHEN WORKING WITH LARGE OR COMPLEX EQUATIONS.

THE OUTPUT OF THE PROGRAM IS A PRINTED REPORT WHICH INCLUDES A DESCRIPTION OF THE PROBLEM, THE STARTING VALUES OF THE COEFFICIENTS, THE SIZE OF THE INCREMENTAL STEPS, A SUMMARY OF EACH ITERATION AND A SUMMARY OF THE FINAL FIT (IN TERMS SIMILAR TO THOSE IN THE LINEAR LEAST-SQUARES CURVE FITTING PROGRAM). THE STATISTICS CALCULATED INCLUDE THE NUMBER OF OBSERVATIONS, THE NUMBER OF COEFFICIENTS, THE RESIDUAL DEGREES OF FREEDOM, THE MAXIMUM AND MINIMUM VALUE OF THE DEPENDENT VARIABLE AS WELL AS ITS RANGE, THE STANDARD ERROR AND T-VALUE FOR EACH COEFFICIENT, THE RESIDUAL SUM OF SQUARES, THE RESIDUAL MEAN SQUARE, AND THE RESIDUAL ROOT MEAN SQUARE.

LISTINGS ARE MADE OF THE OBSERVED AND FITTED VALUES OF THE DEPENDENT VARIABLE -- BOTH IN THE SEQUENCE IN WHICH OBSERVATIONS WERE GIVEN TO THE COMPUTER, AND IN THE ORDER OF THE MAGNITUDE OF THE DIFFERENCES BETWEEN THE OBSERVED AND FITTED VALUES. PLOTS ARE MADE TO INDICATE (1) WHETHER THESE DIFFERENCES ARE NORMALLY DISTRIBUTED AND (2) HOW THEY ARE DISTRIBUTED OVER ALL THE FITTED VALUES OF THE DEPENDENT VARIABLE. PLOTS OF THESE DIFFERENCES VERSUS EACH OF THE INDEPENDENT VARIABLES CAN BE USED TO CHOOSE THE APPROPRIATE FORM OF THE EQUATION AND TO DETERMINE THE DISTRIBUTION OF THE OBSERVATIONS OVER THE RANGE OF EACH INDEPENDENT VARIABLE.

PROVISIONS ARE MADE TO RUN MULTIPLE PROBLEMS AS WELL AS DIFFERENT EQUATIONS USING THE SAME DATA. THE PROGRAM AS DIMENSIONED (114K) WILL HANDLE UP TO 20 VARIABLES AND 170 OBSERVATIONS. INFORMATION IS GIVEN IN THE PROGRAM LISTINGS ON WHICH DIMENSIONS TO CHANGE IN ORDER TO REDUCE THE OVERALL DIMENSIONS OR TO INCREASE EITHER THE NUMBER OF VARIABLES AND/OR THE NUMBER OF OBSERVATIONS THE PROGRAM WILL HANDLE.

THE MACHINE REQUIREMENTS ARE A FORTRAN IV COMPILER, A CARD READER AND A PRINTER.

EXAMPLES ARE GIVEN.

FOR FURTHER EXAMPLES ON THE USE OF THIS PROGRAM, INTERPRETATION OF RESULTS, GLOSSARY OF TERMS, AND USER'S MANUAL, REFER TO "FITTING EQUATIONS TO DATA", COMPUTER

CONTINUED FROM PRIOR COLUMN

ANALYSIS OF MULTI-FACTOR DATA, BY CULBERT DANIEL AND FRED WOOD, WILEY 1971.

PROGRAMMING SYSTEMS - WRITTEN IN OS FORTRAN IV H LEVEL.

MINIMUM SYSTEM REQUIREMENTS - OS/360 (SEE ABSTRACT).

DOCUMENTATION: 33 PAGES, \$.65 ADDITIONAL CHARGE.

CARD COUNT: 1,830 APPROXIMATE.

SUBMITTAL/REVISION DATE: 01/76

360D-13.6.008

LINEAR LEAST-SQUARES CURVE FITTING PROGRAM

AUTHOR: FRED S. WOOD

DIRECT TECHNICAL INQUIRIES TO:

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DESCRIPTION - THIS COMPUTER PROGRAM HAS MANY OPTIONS WHICH ALLOW THE USER TO TRANSFORM DATA INTO AN APPROPRIATE FORM, FIT SPECIFIED EQUATIONS TO THE TRANSFORMED DATA BY LINEAR LEAST-SQUARES, AND PROVIDES BOTH STATISTICS AND PLOTS TO AID IN EVALUATING THE FIT. A CP-STATISTIC SEARCH TECHNIQUE DETERMINES IF SMALLER SETS OF THE VARIABLES WILL REPRESENT THE DATA EQUALLY WELL.

THE TRANSFORMATIONS WHICH ARE AVAILABLE TO THE USER INCLUDE RECIPROCALs, SUMS, DIFFERENCE, PRODUCTS, QUOTIENTS, LOGARITHMS, AND EXPONENTIALS. SUCH TRANSFORMATIONS ARE USED TO CONVERT THE OBSERVED DATA TO MORE CONVENIENT OR MORE RATIONAL UNITS, TO ADD TERMS THAT ARE FUNCTIONS OF THE DATA-VARIABLES, TO STABILIZE VARIANCE, AND TO OMIT VARIABLES.

IN ADDITION TO THE USUAL STATISTICS, THE PROGRAM CALCULATES THE MAXIMUM AND MINIMUM VALUE OF EACH VARIABLE AS WELL AS ITS RANGE, THE RELATIVE INFLUENCE OF EACH VARIABLE AND THE WEIGHTED SQUARED STANDARDIZED DISTANCE OF EACH OBSERVATION FROM THE CENTROID OF ALL OBSERVATIONS. NEAR NEIGHBORS ARE USED TO ESTIMATE THE STANDARD DEVIATION OF THE DEPENDENT VARIABLE. A TABLE OF COMPONENT EFFECTS SHOWS HOW EACH VARIABLE CONTRIBUTES TO THE FITTED VALUE OF EACH

CONTINUED FROM PRIOR COLUMN

OBSERVATION. CROSS VERIFICATION OF COEFFICIENTS CAN BE MADE WITH A SECOND SAMPLE OF DATA.

LISTINGS ARE MADE OF THE OBSERVED AND FITTED VALUES OF THE DEPENDENT VARIABLE -- BOTH IN THE SEQUENCE IN WHICH OBSERVATIONS WERE GIVEN TO THE COMPUTER, AND IN THE ORDER OF THE MAGNITUDE OF THE DIFFERENCES BETWEEN THE OBSERVED AND FITTED VALUES. PLOTS ARE MADE TO INDICATE (1) WHETHER THESE DIFFERENCES ARE NORMALLY DISTRIBUTED AND (2) HOW THEY ARE DISTRIBUTED OVER ALL THE FITTED VALUES OF THE DEPENDENT VARIABLE. PLOTS OF THESE DIFFERENCES, TOGETHER WITH THE COMPONENT EFFECTS OF EACH INDEPENDENT VARIABLE, CAN ALSO BE USED (1) TO CHOOSE THE APPROPRIATE FORM OF THE EQUATION, (2) TO DETERMINE THE DISTRIBUTION OF THE OBSERVATIONS OVER THE RANGE OF EACH INDEPENDENT VARIABLE AND (3) TO ASCERTAIN THE INFLUENCE OF EACH OBSERVATION ON EACH COMPONENT OF THE EQUATION.

THE PROGRAM, AS DIMENSIONED, WILL HANDLE UP TO 105 VARIABLES BEFORE TRANSFORMATIONS, 80 AFTER, AND 1000 OBSERVATIONS. PROGRAM CHANGE CARDS ARE INCLUDED TO ALLOW A COMPUTER CENTER TO ALSO OFFER A SMALLER PROGRAM WHICH WILL HANDLE UP TO 35 VARIABLES BEFORE TRANSFORMATIONS, 10 AFTER, AND 200 OBSERVATIONS. MULTIPLE DEPENDENT VARIABLES ARE FITTED ONE AT A TIME AND MULTIPLE FORMS OF SPECIFIED LINEAR EQUATIONS CAN BE FITTED WITH ONE DATA LOADING.

THE MACHINE REQUIREMENTS ARE A FORTRAN IV COMPILER, A CARD READER, FOUR SCRATCH FILES AND A PRINTER. THE CURRENT OVERALL DIMENSIONS OF THE 80 VARIABLE PROGRAM IS 200K, THE 10 VARIABLE PROGRAM 66K.

FOR FURTHER EXAMPLES ON THE USE OF THIS PROGRAM, INTERPRETATION OF RESULTS, GLOSSARY OF TERMS, AND USER'S MANUAL, REFER TO "FITTING EQUATIONS TO DATA", COMPUTER ANALYSIS OF MULTIFACTOR DATA FOR SCIENTISTS AND ENGINEERS BY CULBERT DANIEL AND FRED WOOD, WILEY 1971.

PROGRAMMING LANGUAGE - OS FORTRAN H

MINIMUM SYSTEM REQUIREMENTS - SEE ABSTRACT.

DOCUMENTATION: 88 PAGES, \$3.40 ADDITIONAL CHARGE

CARD COUNT: 3,700 APPROXIMATE

SUBMITTAL/REVISION DATE: 11/75.

360D-13.7.001

DIALL - GENERAL LEAST SQUARES DIALLEL ANALYSIS OF VARIANCE

AUTHOR: H.E. SCHAFFER R.A. USANIS

DIRECT TECHNICAL INQUIRIES TO:

DR. H. E. SCHAFFER  
DEPT. OF GENETICS  
N. C. STATE UNIVERSITY  
RALEIGH, NORTH CAROLINA 27607

DESCRIPTION - TWO MAIN PROGRAMS, DIALL AND DIALLC, WHICH DO A GENERAL LEAST SQUARES ANALYSIS FOR A GENERAL (UNBALANCED) DIALLEL EXPERIMENT, ARE DESCRIBED IN DETAIL. THE PROGRAMS, WITH THEIR SUBROUTINES, WILL COMPUTE THE ANALYSIS OF VARIANCE AND ANALYSIS OF CROSS-PRODUCTS TABLES FOR ANY NUMBER OF VARIABLES INCLUDING THE EXPECTATIONS OF THE MEAN SQUARES, CALCULATE THE ESTIMATES OF THE VARIANCE COMPONENTS AND ESTIMATE THE CORRELATIONS BETWEEN THE EFFECTS FOR DIFFERENT TRAITS. TWO EXAMPLES ARE GIVEN OF THE USE OF THESE PROGRAMS. FOR A COMPLETE ANALYSIS OF A 5 LINE DIALLEL EXPERIMENT WITH TWO REPLICATES AND ONE VARIABLE APPROXIMATELY 42K BYTES OF MEMORY ARE NEEDED. THE MEMORY REQUIREMENTS INCREASE MORE RAPIDLY THAN AN INCREASE IN THE NUMBER OF LINES.

PROGRAMMING SYSTEMS - WRITTEN IN FORTRAN IV, G LEVEL AND TESTED USING OS/360.

MINIMUM SYSTEM REQUIREMENTS - OUTPUT RECORDS UP TO 132 CHARACTERS ARE PRODUCED. NO SPECIAL EQUIPMENT IS REQUIRED.

DOCUMENTATION: 27 PAGES, \$.35 ADDITIONAL CHARGE.  
CARD COUNT: 1,250 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 06/69

360D-15.0.005

TRANSIENT SOLUTIONS FOR MARKOV CHAINS

AUTHOR: WINFRIED K. GRASSMANN AND T. K. NGAI

DIRECT TECHNICAL INQUIRIES TO:

DR. WINFRIED K. GRASSMAN  
DEPARTMENT OF COMPUTATIONAL SCIENCE  
UNIVERSITY OF SASKATCHEWAN  
SASKATOON, SASKATCHEWAN  
CANADA

DESCRIPTION - THE PROGRAM FINDS TRANSIENT SOLUTIONS FOR CONTINUOUS MARKOV-CHAINS WITH SPARSE TRANSITION MATRICES. SUCH MARKOV-CHAINS OCCUR FREQUENTLY IN QUEUEING THEORY, ESPECIALLY IN SITUATIONS WITH MORE THAN ONE QUEUE. THE PROGRAM IS WRITTEN IN FORTRAN G. IT CONSISTS OF LESS THAN 200 STATEMENTS AND HAS NO SUBROUTINES. THE METHOD EMPLOYED IS RANDOMIZATION. THE ALGORITHM IS DESCRIBED BY W. GRASSMANN IN "TRANSIENT SOLUTIONS IN SIMPLE QUEUES", WORKING PAPERS OF THE DEPARTMENT OF COMPUTATIONAL SCIENCE, UNIVERSITY OF SASKATCHEWAN, 74-R-2, PAGE 7.

PROGRAMMING LANGUAGE - FORTRAN G

MINIMUM SYSTEM REQUIREMENTS - CS/360, FORTRAN G.

DOCUMENTATION: 25 PAGES, \$.25 ADDITIONAL CHARGE.  
CARD COUNT: 350 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 11/74.

360D-15.1.004

360 GASP III - GENERALIZED ACADEMIC SIMULATION PROGRAM

AUTHOR: J. LINDERMAN R. E. HOLZ

DIRECT TECHNICAL INQUIRIES TO:

J. L. LINDERMAN  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
77 MASSACHUSETTS AVENUE  
CAMBRIDGE, MASSACHUSETTS 02139

DESCRIPTION - 360 GASP III IS A SYSTEM FOR EDUCATIONAL SCHEDULING (TIMETABLE CONSTRUCTION, RESOURCE ALLOCATION, SECTIONING, EXAMINATION SCHEDULING, SIMULATION AND PLANNING). THIS VERSION, DESIGNED WITH MODERN INSTITUTIONS



CONTINUED FROM PRIOR COLUMN

IN MIND, IS ABLE TO COPE WITH MODULAR SCHEDULING, TEAM TEACHING, ABILITY TRACKING, INDIVIDUAL STUDIES, ETC. IN CONTRAST TO MANY DATA PROCESSING ALGORITHMS, GASP IS BASICALLY HEURISTIC, SEEKING A "SATISFACTORY" SOLUTION RATHER THAN AN "OPTIMAL" ONE. THE APPROACH HAS PROVEN BOTH OPERATIONALLY AND ECONOMICALLY FEASIBLE. MAN-MACHINE INTERACTION IS REQUIRED AND THE SYSTEM IS A SUCCESSFUL AND POWERFUL "TOOL" WHEN USED PROPERLY AS SUCH. SAVINGS IN ADMINISTRATIVE TIME AND EFFORT HAVE BEEN REPORTED AS HIGH AS 75 PER CENT. MORE DETAILED INFORMATION ABOUT THE AREA AND METHOD OF APPLICATION IS AVAILABLE IN THE WRITE-UP. THE TRANSMITTAL TAPE INCLUDES A LOAD LIBRARY, PROGRAM SOURCE AND OBJECT, AND SAMPLE DATA. 360 GASP III IS SIMILAR TO 7090/94 GASP III (MI GASP SDA NO. 3455) IN DOCUMENTATION AND EFFECT.

PROGRAMMING SYSTEMS - UTILIZES THE SYSTEM/360 OPERATING SYSTEM.

MINIMUM SYSTEM REQUIREMENTS - S/360 WITH 128K CORE STORAGE.

DOCUMENTATION: 152 PAGES, \$6.60 ADDITIONAL CHARGE.  
CARD COUNT: 30,800 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 07/67

360D-15.1.008  
SOL-370 SIMULATION SYSTEM

AUTHOR: HORST E. ULFERS

DIRECT TECHNICAL INQUIRIES TO:  
HORST E. ULFERS  
DCEC, CODE R830  
1860 WIEHLE AVENUE  
RESTON, VIRGINIA 22090

DESCRIPTION - THE SOL-370 SIMULATION SYSTEM IS A GENERAL PURPOSE SIMULATOR FOR DISCRETE MODELING AND SIMULATION. THE SOURCE LANGUAGE IS ENGLISH-LIKE AND HAS BEEN IMPLEMENTED AS AN EXTENSION TO PL/I. THE SYSTEM PRODUCES OBJECT CODE AND PROVIDES FOR EXTENSIVE INTERACTIVE POST-SIMULATION ANALYSIS.

THE SYSTEM IS COMPATIBLE WITH ALL VERSIONS OF THE PL/I-F, PL/I-OPTIMIZING, AND PL/I-CHECKOUT COMPILERS AND CAN BE USED IN THE OS/MVT AND OS/MVT-TSO ENVIRONMENT. IT CAN BE OPERATED IN THE BATCH OR TSO MODE.

CONTINUED FROM PRIOR COLUMN

MINIMUM SYSTEM REQUIREMENTS FOR SOL-370, RELEASE 1/76, ARE 200K OF CORE AND 250 TRACKS OF 3330 DISK OR EQUIVALENT.

THE DOCUMENTATION CONSISTS OF THE "SOL-370 LANGUAGE REFERENCE MANUAL AND A USER'S GUIDE", TN 25-75, AND THE "SOL-370 INSTALLATION AND ERROR TRACING GUIDE", TN 23-76. BOTH DOCUMENTS ARE AVAILABLE ALSO THROUGH THE DEFENSE DOCUMENTATION CENTER (DDC).

PROGRAMMING LANGUAGE - OS/PL/I

MINIMUM SYSTEM REQUIREMENTS - SEE ABSTRACT

DOCUMENTATION: 58 PAGES, \$1.90 ADDITIONAL CHARGE.  
CARD COUNT: NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 6/76

360D-15.2.007  
MFOR 360 LINEAR PROGRAMMING CCDE

AUTHOR: J. SHWIMER

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
CURRENTLY NOT AVAILABLE.

DESCRIPTION - MFOR 360 IS AN INDEPENDENT ROUTINE WHICH USES THE REVISED SIMPLEX METHOD WITH THE PRODUCT FORM OF THE INVERSE TO SOLVE THE LINEAR PROGRAMMING PROBLEM IN STANDARD FORM. MFOR 360 HAS BEEN COMPILED AND TESTED USING OS VERSION 11 ON A S/360 MODEL 65.

THE ROUTINE IS AN ALL-IN-CORE ROUTINE, THEREFORE NO SECONDARY STORAGE IS NEEDED. SYMBOLIC CONTROL CARDS DIRECT THE OPERATION OF MFOR 360.

PROGRAMMING SYSTEMS - WRITTEN IN FORTRAN IV (G LEVEL) WITH ONE SUBROUTINE IN 360 BASIC ASSEMBLER LANGUAGE.

MINIMUM SYSTEM REQUIREMENTS - THOSE NEEDED TO RUN OS/360.

DOCUMENTATION: 30 PAGES, \$.50 ADDITIONAL CHARGE.  
CARD COUNT: 1,450 APPROXIMATE.

CONTINUED FROM PRIOR COLUMN

SUBMITTAL/REVISION DATE: 03/68

360D-15.2.011

ZERO-ONE INTEGER PROGRAMMING WITH HEURISTICS

AUTHOR: E. D. HOLCOMB

DIRECT TECHNICAL INQUIRIES TO:

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 UNION CARBIDE CORPORATION  
 NUCLEAR DIVISION  
 COMPUTING CENTER  
 ELDG. K-1007 MAIL STOP 17  
 POST OFFICE BOX P  
 OAK RIDGE, TENNESSEE 37830

DESCRIPTION - THE ZERO-ONE INTEGER PROGRAMMING WITH HEURISTICS PROGRAM IS DESIGNED TO SOLVE LINEAR PROGRAMMING PROBLEMS WHOSE VARIABLES ARE RESTRICTED TO VALUES OF ZERO OR ONE. THE PROGRAM UTILIZES THE WELL KNOWN ADDITIVE ALGORITHM OF EGON BALAS COMBINED WITH A GROUP OF USER SELECTED HEURISTIC TEST OPTIONS DESIGNED TO SPEED SOLUTION TIME BY TAKING ADVANTAGE OF INDIVIDUAL PROBLEM CHARACTERISTICS.

PROGRAMMING SYSTEMS - THE PROGRAM DECK CONSISTS OF A MAIN PROGRAM AND FOUR SUBROUTINES WRITTEN IN FORTRAN PLUS A THREE CARD OBJECT DECK OF A CLOCK READING FUNCTION.

MINIMUM SYSTEM REQUIREMENTS - THE PROGRAM HAS BEEN TESTED ON THE IBM 360 MODEL 50 USING OS/360. HOWEVER, THE USE OF ANY IBM 360 MODEL 40 OR LARGER WITH OS/360 SHOULD NOT CAUSE DIFFICULTIES.

DOCUMENTATION: 8 PAGES, NO ADDITIONAL CHARGE.  
 CARD COUNT: 600 APPROXIMATE.  
 SUBMITTAL/REVISION DATE: 12/68

360D-15.2.014

AN ADJACENT EFFICIENT EXTREME POINT ALGORITHM FOR VECTOR-MAXIMUM AND INTERVAL WEIGHTED-SUMS LINEAR PROGRAMMING PROBLEMS

AUTHOR: RALPH E. STEUER

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 UNIVERSITY OF KENTUCKY  
 LEXINGTON, KY 40506

DESCRIPTION - ADEX IS INTENDED FOR USE IN ANALYZING MULTIPLE OBJECTIVE LINEAR PROGRAMMING PROBLEMS. ITS PRIMARY ADVANTAGE IS THAT (RATHER THAN GENERATING JUST ONE SOLUTION) A LIST OF SEVERAL CANDIDATE SOLUTIONS IS PRODUCED. THIS IS ACCOMPLISHED BY UTILIZING A VECTOR-MAXIMUM REPRESENTATION OF LINEAR MULTIPLE OBJECTIVE PROGRAMMING PROBLEMS AND THEN SOLVING FOR ALL EFFICIENT (I.E., PARETO OPTIMAL) EXTREME POINTS.

IN ORDER TO CONTROL THE NUMBER OF EFFICIENT EXTREME POINTS GENERATED, ADEX ALLOWS THE SPECIFICATION OF (RATHER THAN POINT ESTIMATE WEIGHTS) INTERVAL WEIGHTS FOR EACH OF THE DIFFERENT OBJECTIVES. THE LOOSER THE INTERVAL CRITERION WEIGHT BOUNDS, THE GREATER THE NUMBER OF EFFICIENT EXTREME POINTS GENERATED; THE TIGHTER THE INTERVAL BOUNDS, THE FEWER EFFICIENT EXTREME POINTS GENERATED.

ADEX CAN ALSO BE APPLIED TO GCAL PROGRAMMING SITUATIONS WHERE COMBINATIONS OF THE DIFFERENT DEVIATION VARIABLES HAVE BEEN STRUCTURED AS DISTINCT OBJECTIVES. IN ADDITION, THE CODE CAN BE USED TO LOCATE ALL OPTIMAL EXTREME POINTS OF A SINGLE OBJECTIVE LINEAR PROGRAM.

ADEX IS A SELF-CONTAINED PROCEDURE (MAIN PROGRAM AND ALL NECESSARY SUBROUTINES) THAT IS WRITTEN IN FORTRAN IV. THE ALGORITHM EMPLOYS A METHOD OF CHERNIKOVA FOR DETERMINING WHICH EXTREME POINTS OF THE FEASIBLE REGION ARE ADJACENT TO A GIVEN EFFICIENT EXTREME POINT. IN COMPARISON WITH ADBASE, AN ALTERNATIVE PROCEDURE FOR THE SAME PURPOSES, ADEX WILL RUN FASTER ON PROBLEMS WITH HIGHLY DEGENERATE EXTREME POINTS BUT ONLY AT THE EXPENSE OF LARGE CORE STORAGE REQUIREMENTS.

THE CODE IS ACCOMPANIED BY A COMPREHENSIVE 117 PAGE OPERATING MANUAL.

PROGRAMMING LANGUAGE - FORTRAN IV

CONTINUED FROM PRIOR COLUMN

MINIMUM SYSTEM REQUIREMENTS - NONE SPECIFIED.

DOCUMENTATION: 120 PAGES, \$5.00 ADDITIONAL CHARGE.  
CARD COUNT: 2,000 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 12/74.

360D-15.6.003

COMPUTERIZED RELATIVE ALLOCATION OF FACILITIES  
TECHNIQUE, CRAFT 4.2

AUTHOR: G.C. ARMOUR

DIRECT INQUIRIES TO:

T.L. WARD  
OHE 400  
UNIVERSITY OF SOUTHERN CALIFORNIA  
LOS ANGELES, CA 90007

360D-15.3.003

A COMPLEMENTARY PIVOT METHOD FOR SOLVING QUADRATIC  
PROGRAMMING PROBLEMS

AUTHOR: A. RAVINDRAN

DIRECT TECHNICAL INQUIRIES TO:

PROFESSOR A. RAVINDRAN  
SCHOOL OF INDUSTRIAL ENGINEERING  
PURDUE UNIVERSITY  
WEST LAFAYETTE, INDIANA 47907

DESCRIPTION - THIS PROGRAM CAN SOLVE ANY CONVEX QUADRATIC PROGRAMMING OR LINEAR PROGRAMMING PROBLEM. THE ENTIRE PROGRAM IS WRITTEN IN FORTRAN IV SO THAT IT CAN BE IMPLEMENTED EASILY IN ANY COMPUTING SYSTEM. THE PROGRAM IS BASED ON THE COMPLEMENTARY PIVOT METHOD FOR SOLVING COMPLEMENTARY PROBLEMS. ITS MAIN FIELD OF APPLICATION IS IN MANAGEMENT SCIENCE/OPERATIONS RESEARCH FOR SOLVING NONLINEAR PROGRAMMING OR CONSTRAINED OPTIMIZATION PROBLEMS. THE PROGRAM CONSISTS OF A MAIN PROGRAM AND A NUMBER OF SUBROUTINES WRITTEN IN FORTRAN LANGUAGE. IN ITS PRESENT FORM, IT REQUIRES 70K WORDS IN CDC 6500 MACHINE FOR LOADING AND EXECUTING AND CAN SOLVE QUADRATIC OR LINEAR PROGRAMMING PROBLEMS WHOSE ROWS DO NOT EXCEED 75. THE PROBLEM SIZE CAN BE REDUCED TO ACCOMODATE CORE AVAILABILITY OF SMALLER MACHINES. LARGER PROBLEMS CAN BE SOLVED BY INCREASING THE SIZE OF THE DIMENSION STATEMENTS.

PROGRAMMING LANGUAGE - FORTRAN IV

MINIMUM SYSTEM REQUIREMENTS - SEE ABSTRACT

DOCUMENTATION: 15 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 8/76

DESCRIPTION - COMPUTERIZED RELATIVE ALLOCATION OF FACILITIES TECHNIQUE (CRAFT) ACCEPTS AN INITIAL LAYOUT PATTERN FOR A PHYSICAL FACILITY AND GENERATES IMPROVED LAYOUTS. THE PROGRAM IS GOVERNED BY HEURISTIC RULES WHICH SEQUENTIALLY ALTER LAYOUT PATTERNS WHILE ATTEMPTING TO MINIMIZE VARIABLE MATERIAL HANDLING COSTS. INPUTS ARE MATERIAL HANDLING AND FLOW AND COST DATA, AND AN INITIAL LAYOUT OF DEPARTMENTAL AREAS. CRAFT GENERATES THE VARIABLE COST OF MATERIAL HANDLING FOR THE INITIAL LAYOUT. THE PROGRAM THEN TRIES COMBINATIONS OF TWO DEPARTMENT EXCHANGES, ATTEMPTING TO FIND A LESS COSTLY LAYOUT. MODIFICATIONS CONTINUE UNTIL NO FURTHER COST REDUCTION IS POSSIBLE. CRAFT CAN ALSO BE BE APPLIED TO ANY MOVEMENT PROBLEM THAT CAN BE REPRESENTED ON A COST-PER-FOOT BASIS. THE FLOW OF PEOPLE IN AN OFFICE LAYOUT IS AN EXAMPLE. CRAFT WAS WRITTEN BY ARMOUR (C.1961), REVISED (CRAFT IV) BY FAGNANI IN 1967, FURTHER REVISED (CALLED CRAFT 4.1 HERE), AND SUBMITTED TO SHARE IN 1974. CRAFT 4.2 MODIFIES CRAFT 4.1 FOR THE IBM 360/370. FORTRAN IV WITH SOME ASSEMBLER SUBROUTINES; REQUIRES 220K TO COMPILE AND LINK-EDIT AND 160K TO LOAD WITHOUT OVERLAYS.

PROGRAMMING LANGUAGE - IBM FORTRAN IV, OS ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - (SEE ABSTRACT)

DOCUMENTATION: 112 PAGES, \$4.60 ADDITIONAL CHARGE.  
CARD COUNT: 2,550 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 04/76

360D-15.6.004

CRAFT-M - COMPUTERIZED ALLOCATION OF FACILITIES  
TECHNIQUE (INCLUDING DEPT. MOVE COSTS)

AUTHORS: P. HICKS & T. COWAN

DIRECT TECHNICAL INQUIRIES TO:

MR. TROY COWAN  
CONTRACTS DIVISION, ERDA  
BOX 5400  
ALBUQUERQUE, NM 87115

DESCRIPTION - CRAFT IS A COMPUTER PROGRAM FOR HEURISTICALLY DETERMINING THE RELATIVE LOCATION OF ACTIVITIES IN A PLANT LAYOUT IN AN ATTEMPT TO MINIMIZE THE MATERIAL HANDLING COSTS OF ALL PRODUCTS FLOWING BETWEEN DEPARTMENTS PER UNIT TIME. INPUT CONSISTS OF AN INITIAL LAYOUT OF ACTIVITY AREAS, AND FLOW AND MATERIAL HANDLING COST DATA. THE PROGRAM CONSIDERS SWITCHING DEPARTMENTS IN AN EFFORT TO REDUCE OVERALL MATERIAL HANDLING COST.

CRAFT-M, AN EXTENSION TO CRAFT, REQUIRES ADDITIONAL INPUTS OF 1) FIXED COST, AND VARIABLE COST PER UNIT DISTANCE, TO MOVE EACH ACTIVITY AREA, 2) INTEREST RATE AND NUMBER OF INTEREST PERIODS FOR PRORATING MOVE COSTS OVER THE LIFE OF THE REARRANGEMENT, AND 3) EXPECTED MATERIAL HANDLING COST REDUCTION MADE POSSIBLE BY AN ACTIVITY AREA MOVE. IN CRAFT-M, DEPARTMENTS ARE SWITCHED IF THE RESULTING MATERIAL HANDLING COST IMPROVEMENT MORE THAN COVERS THE DEPARTMENTAL MOVE COSTS OVER THE LIFE OF THE ARRANGEMENT.

PROGRAMMING LANGUAGE - IBM FORTRAN IV, OS ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - NONE STATED

DOCUMENTATION: 18 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 2,200 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 6/76

360D-16.0.001

UCARDS: UNION CARBIDE AUTOMATIC ROUTINE AND DESIGN FOR  
PRINTED CIRCUIT BOARDS

AUTHOR: J. R. JAMISON

DIRECT TECHNICAL INQUIRIES TO:

B. L. CRASS  
UNION CARBIDE CORPORATION  
NUCLEAR DIVISION  
P. O. BOX P, K1007, STP 53  
OAK RIDGE, TENNESSEE 37830

DESCRIPTION - THE S/360 UCARDS PROGRAM IS AN AUTOMATED DESIGN SYSTEM FOR PRODUCING COMPONENT LAYOUT, CONDUCTOR LAYOUT AND OTHER AIDS FOR THE FABRICATION OF PRINTED CIRCUIT BOARDS.

PROGRAMMING SYSTEMS - WRITTEN PRIMARILY IN FORTRAN IV AND IS PRESENTLY IMPLEMENTED ON AN IBM 360/50-65 INTERCOUPLED SYSTEM.

MINIMUM SYSTEM REQUIREMENTS - ALL OF THE PROGRAM WAS COMPILED AND CHECKED OUT USING VERSION 15/16 AND REQUIRES APPROXIMATELY 280,000 BYTES OF CORE STORAGE, TWO 9-CHANNEL AND TWO 7-CHANNEL TAPE DRIVES. OF COURSE, A CARD READER AND PRINTER ARE REQUIRED.

DOCUMENTATION: 8 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 16,050 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 06/69

360D-16.0.002

PROGRAMS FOR CALCULATION OF MICROWAVE INTERFERENCE

AUTHOR: M. J. PAGONES

DIRECT TECHNICAL INQUIRIES TO:

MICHAEL J. PAGONES  
ROOM 3C-607  
BELL LABORATORIES  
HOLMDEL, NJ 07733

DESCRIPTION - THE PROGRAMS FMSPREV, ANINIP, AND ARBINTP ARE INTENDED TO BE USED FOR TERRESTRIAL MICROWAVE RADIO INTERFERENCE COORDINATION.

CONTINUED FROM PRIOR COLUMN

THE FMSPREY PROGRAM CALCULATES THE SPECTRAL DENSITY OF AN FDM-FM SIGNAL, AND ANINTP CALCULATES THE INTERFERENCE BETWEEN TWO ANALOG, FDM-FM SIGNALS, AND ARBINTP CALCULATES THE INTERFERENCE BETWEEN ONE ANALOG FDM-FM SIGNAL AND ANOTHER SIGNAL OF ARBITRARY SPECTRAL DENSITY.

THE DOCUMENTATION INCLUDES USER'S MANUALS AND LIMITATIONS OF THE SOFTWARE.

PROGRAMMING LANGUAGE - PL/I (F).

MINIMUM SYSTEM REQUIREMENTS - OS/360

DOCUMENTATION: 33 PAGES, \$.65 ADDITIONAL CHARGE.  
CARD COUNT: 2,053.  
SUBMITTAL/REVISION DATE: 4/75.

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360D-16.0.003

FAA INTEGRATED NOISE MODEL PROGRAM PACKAGE (VERSION 2)

AUTHOR: DR. PETER A. MANSBACH

DIRECT TECHNICAL INQUIRIES TO:

DR. RONALD G. GADOS, W545  
THE MITRE CORPORATION  
METREK DIVISION  
1820 DOLLEY MADISON BLVD.  
MCLEAN, VIRGINIA 22101

DESCRIPTION - THE FAA AIRCRAFT NOISE MODEL PROGRAM PACKAGE INMPROG PROVIDES THE CAPABILITY TO COMPUTE AIRCRAFT NOISE INDICES AS REQUIRED BY THE INTEGRATED NOISE MODEL. TABULAR OUTPUT INCLUDES LDN, LEQ, AND DURATIONS OF EXPOSURE ABOVE VARIOUS DB(A) THRESHOLDS. PLOTTER OUTPUT IS ALSO GENERATED. THE PACKAGE INCLUDES ITS OWN DATA BASE.

THE PROGRAMS ARE WRITTEN IN PL/I, AND REQUIRE PREPROCESSOR AND REGIONAL (1) I/O CAPABILITY. 5 MAIN PROGRAMS, 22 SUB-PROGRAMS, AND 5 MACRO FILES COMPRISE THE PROGRAM. THE REQUIRED STANDARD NOISE LIBRARY AND ACOUSTIC DATA LIBRARY ARE ALSO SUPPLIED; HOWEVER, THESE ARE IN IBM 360/370 MACHINE READABLE DATA FORMS. THE PROGRAMS WERE DEVELOPED ON AN IBM 370/145 UNDER CMS, USING A VIRTUAL MACHINE SIZE OF 512K. THEY ARE EXPECTED TO RUN ON ANY IBM 360 OR 370, EITHER CMS OR OS, WITH 400K OR MORE OF MEMORY, REAL OR VIRTUAL. THE PLOTTER PROGRAM

CONTINUED FROM PRIOR COLUMN

REQUIRES THE BASIC CALCOMP SUBROUTINES WITH FORTRAN LINKAGES. USERS SHOULD OBTAIN THE "FAA INTEGRATED NOISE MODEL-USER'S GUIDE", FAA-EQ-76-2, FROM THE NATIONAL TECHNICAL INFORMATION SERVICE (NTIS), SPRINGFIELD, VA 22151. A PROGRAMMER'S GUIDE AND DATA BASE DESCRIPTION ARE BEING PREPARED.

PROGRAMMING LANGUAGE - PL/I, CALCOMP PLOTTER SOFTWARE

MINIMUM SYSTEM REQUIREMENTS - CMS/OS/IBM/360/370, DIRECT ACCESS STORAGE AND AT LEAST 400K BYTES CF STORAGE

DOCUMENTATION: 20 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 10/76

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360D-16.1.001

ROCKET - FORTRAN 4 VERSION

AUTHORS: B. BOEHM J. RIEBER  
MISS P. LEONHARDT

DIRECT TECHNICAL INQUIRIES TO:

GARY D. BROWN  
RAND COMPUTER CENTER  
THE RAND CORPORATION  
1700 MAIN STREET  
SANTA MONICA, CA 90406

DESCRIPTION - ROCKET IV IS A FORTRAN IV PROGRAM WHICH MATHEMATICALLY SIMULATES THE FLIGHT OF AEROSPACE VEHICLES BY NUMERICAL INTEGRATION OF THEIR EQUATIONS OF MOTION. A SPECIAL PURPOSE INPUT FORM ENABLES THE USER TO SPECIFY THE CHARACTERISTICS OF HIS VEHICLE AND ITS FLIGHT PLAN, BOTH OF WHICH CAN VARY THROUGH A WIDE RANGE OF CHOICES, WITH COMPARATIVELY LITTLE EFFORT.

PROGRAMMING SYSTEMS - WRITTEN IN FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - THE PROGRAM REQUIRES THE USE OF A FORTRAN COMPILER, READS INPUT FROM TAPE 5, AND WRITES OUTPUT ON TAPE 6. IT OCCUPIES ABOUT 25,000 WORDS OF CORE.

DOCUMENTATION: 18 PAGES, NO ADDITIONAL CHARGE.  
NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 01/67

CONTINUED FROM PRIOR COLUMN

REQUIRES A 2400 FT. TAPE FOR DISTRIBUTION.

360D-16.3.002

PULSE TESTING VIA THE FAST FOURIER TRANSFORM

AUTHORS: CARLOS RAY DOLLAR      CECIL L. SMITH  
PAUL W. MURRILL

DIRECT TECHNICAL INQUIRIES TO:  
C. RAY DOLLAR  
PROCESS COMPUTER ENGINEERING  
DOW CHEMICAL COMPANY  
FREEPORT, TEXAS 77541

DESCRIPTION - SUBROUTINE REFFT ACCOMPLISHES A FAST, ACCURATE TRANSFORMATION OF TIME DOMAIN PULSE RESPONSE DATA TO FREQUENCY RESPONSE DATA USING THE REAL-VALUED FAST FOURIER TRANSFORM. THE SUBROUTINE IS WRITTEN IN FORTRAN IV AND HAS BEEN COMPILED AND TESTED ON A 7040, A S/360 MODEL 50, AND A S/360 MODEL 65. GIVEN TIME DOMAIN INPUT AND OUTPUT PULSE DATA THE SUBROUTINE WILL CALCULATE AND PRINT MAGNITUDES, PHASE ANGLES AND ASSOCIATED FREQUENCIES.

PROGRAMMING SYSTEMS - WRITTEN IN FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - A MINIMUM OF 16K OF CORE STORAGE IS REQUIRED AND WILL RUN ON A S/360 MODEL 30.

DOCUMENTATION: 10 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT:            250 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 10/69

360D-17.1.001

QUANTITATIVE ANALYSIS WITH ELECTRON MICROPROBE ANALYZER

AUTHOR : S. S. SO

DIRECT TECHNICAL INQUIRIES TO:  
DR. SAMUEL S. SO  
IBM CORPORATION K12/282  
5600 COTTLE ROAD  
SAN JOSE, CA 95193

DESCRIPTION - A DESCRIPTION OF TWO FORTRAN IV COMPUTER

CONTINUED FROM PRIOR COLUMN

PROGRAMS IS PRESENTED TO SIMPLIFY QUANTITATIVE AND SEMIQUANTITATIVE ANALYSIS WITH THE ELECTRON MICROPROBE ANALYZER. THE FIRST PROGRAM, EPMP1, DETERMINES THE WEIGHT FRACTION OF EACH ELEMENT IN A SPECIMEN FROM THE CHARACTERISTIC X-RAY INTENSITY MEASUREMENTS OF THE SPECIMEN AND THE STANDARDS. THE SECOND PROGRAM, EPMP2, CALCULATES THE RELATIVE CHARACTERISTIC X-RAY INTENSITIES OF ALL THE ELEMENTS IN A SPECIMEN BY ASSUMING THE COMPOSITION OF THE SPECIMEN TO BE KNOWN. THE CORRECTION PROCEDURE INCLUDES DEAD TIME CORRECTION, ONE OF TWO BACKGROUND CORRECTIONS (EITHER CONSTANT BACKGROUND OR BACKGROUND DEPENDING ON COMPOSITION), PHILIBERTS ABSORPTION CORRECTION MODIFIED BY DUNCUMB AND SHIELDS, ONE OF THREE FLUORESCENCE CORRECTIONS (EITHER BIRKS, CASTINGS, OR REEDS), AND A COMPOUND STANDARD CORRECTION. THE EFFECTS OF THE ABSORPTION AND THE FLUORESCENCE OF EACH ELEMENT IN THE SPECIMEN ARE EASILY SEEN FROM THE OUTPUT RESULTS. VERSATILITY, EFFICIENCY, AND EASE OF OPERATION ARE EMPHASIZED IN THE PROGRAMS. PROGRAM LISTINGS, INPUT DATA FORMAT, AND VARIOUS EXAMPLES SHOWING THE USAGE OF THE PROGRAMS HAVE BEEN INCLUDED IN THE APPENDICES.

PROGRAMMING SYSTEMS - PROGRAMMING LANGUAGE - FORTRAN IV.  
OPERATING SYSTEM REQUIRED - OS/360 WITH FORTRAN IV COMPILER (LEVEL H).

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED BY OS/360, THE FORTRAN IV COMPILER, 36K CORE STORAGE.

DOCUMENTATION: 41 PAGES, \$1.05 ADDITIONAL CHARGE.  
CARD COUNT:            800 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 08/69

360D-17.2.006

CERN SUMX - A DATA SUMMARIZATION PROGRAM FOR THE IEM/360

AUTHORS: DR. M. J. BENISTON    MR. H. R. PENAFIEL

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IBM CORPORATION - 63G  
POST OFFICE BOX 10500  
PALO ALTO, CALIFORNIA 94394

DESCRIPTION - CERN SUMX ANALYZES INFORMATION ABOUT LARGE NUMBER OF EVENTS AND PRODUCES HISTOGRAMS, SCATTER DIAGRAMS, LIST AND ORDERED LISTS. FACILITIES ARE PROVIDED TO SELECT

CONTINUED FROM PRIOR COLUMN

SUBSETS OF EVENTS ACCORDING TO CRITERIA DEFINED ON CONTROL-CARDS, AND TO ALLOW THE USER TO ADD ROUTINES FOR COMPUTING PROGRAM WAS ORIGINALLY WRITTEN AT BERKELEY, BUT THE PRESENT VERSION WAS COMPLETELY REWRITTEN AT CERN IN 1965-1966. (SUMX 466, VERSION 5.25).

PROGRAMMING SYSTEMS - WRITTEN IN FORTRAN IV, LEVEL H FOR S/360.

MINIMUM SYSTEM REQUIREMENTS - 256K, WITHOUT OVERLAYS, THREE TAPE DRIVES, RECOMMENDED MINIMUM OF THREE DISK DRIVES.

DOCUMENTATION: 76 PAGES, \$2.80 ADDITIONAL CHARGE.  
NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 07/67

360D-17.4.003

TRANSIENT ONE-DIMENSIONAL AND SIMULTANEOUS SOLUTE AND WATER FLOW IN SOILS

AUTHOR: H. M. SELIM AND R. S. MANSSELL

DIRECT TECHNICAL INQUIRIES TO:  
H. M. SELIM OR R. S. MANSSELL  
DEPARTMENT OF SOIL SCIENCE  
2169 MCCARTY HALL  
UNIVERSITY OF FLORIDA  
GAINESVILLE, FLORIDA 32611

DESCRIPTION - A COMPUTER PROGRAM HAS BEEN DEVELOPED FOR THE PROBLEM OF SOLUTE AND WATER MOVEMENT IN UNSATURATED SOILS OR POROUS MEDIA UNDER TRANSIENT FLOW CONDITIONS. THE TWO NON-LINEAR PARTIAL DIFFERENTIAL EQUATIONS GOVERNING THE SOLUTE AND WATER FLOW ARE SOLVED SIMULTANEOUSLY FOR THE WATER CONTENT AND SOLUTE CONCENTRATION AT ANY SPECIFIED TIME AND LOCATION AS DESIRED. THE INITIAL CONDITIONS USED ARE UNIFORM SALT AND WATER CONTENT DISTRIBUTIONS AT TIME  $T=0$ . THE BOUNDARY CONDITIONS AT THE SOIL SURFACE ARE WATER FLUX AND CONSTANT SALT CONCENTRATION CONDITIONS. THE METHOD OF SOLUTION IS A NUMERICAL ONE WHICH UTILIZES THE EXPLICIT-IMPLICIT FINITE DIFFERENCE TECHNIQUE.

THE COMPUTER PROGRAM IS WRITTEN IN FORTRAN LANGUAGE AND CONSISTS OF A SOURCE PROGRAM, ELEVEN SUBPROGRAMS, AND AN INPUT DATA SECTION. AN IMPORTANT FEATURE OF THE PROGRAM IS THAT INCREMENTAL DISTANCE AND TIME STEPS ARE ADJUSTED AUTOMATICALLY TO SATISFY STABILITY AND CONVERGENCE CRITERIA

CONTINUED FROM PRIOR COLUMN

FOR THE WATER AND SOLUTE FINITE DIFFERENCE CRITERIA. A SECOND FEATURE IS THAT THE NUMBER OF NODAL POINTS ARE AUTOMATICALLY CALCULATED FROM THE LENGTH OF THE FLOW REGION. A THIRD FEATURE OF THE PROGRAM IS THAT OUTPUT DATA OF WATER CONTENT, WATER FLUX, SOLUTE CONCENTRATION, AND SOLUTE FLUX IN THE FLOW REGION ARE PROVIDED AT SPECIFIED TIMES AS DESIRED.

PROGRAMMING LANGUAGE - FORTRAN IV

MINIMUM SYSTEM REQUIREMENTS - OS/360, 128K PROGRAM

DOCUMENTATION: 50 PAGES, \$1.50 ADDITIONAL CHARGE.  
CARD COUNT: 620 CARDS APPROXIMATE.  
SUBMITTAL/REVISION DATE: 9/74.

360D-17.4.004

CAMIVA - CARTOGRAPHIC AUTOMATIC MAPPING SYSTEM

AUTHOR: WILLIAM G. SCHENK

DIRECT TECHNICAL INQUIRIES TO:  
WILLIAM G. SCHENK  
AFTAC/ADOS, BLDG. 989  
PATRICK AFB, FLORIDA 32925

DESCRIPTION - CAMIVA IS AN IBM SYSTEM 360 FORTRAN PROGRAM THAT PERFORMS A WIDE VARIETY OF CARTOGRAPHIC PLOTTING TASKS. IT WILL CONNECT POINTS WITH STRAIGHT LINES OR GREAT CIRCLES AND DRAW LINE GRIDS, RANGE RINGS, ELLIPSES, CONES, AZIMUTHS, AND A HOST OF OTHER MAP FEATURES. INCLUDED ALSO ARE A SELECTION OF 17 MAP PROJECTIONS THAT CAN BE USED IN CONJUNCTION WITH WORLD DATA BANK I. THE STRUCTURE OF CAM IS MODULAR TO PERMIT THE EASY ADDITION OF NEW FEATURES OR SUBROUTINES TO READ DATA IN A DIFFERENT FORMAT.

PROGRAMMING LANGUAGE - FORTRAN AND ASSEMBLER

MINIMUM SYSTEM REQUIREMENTS - CS/360 AND PLOTTER

DOCUMENTATION: 6 PAGES, NO ADDITIONAL CHARGE.  
(PLUS MACHINE READABLE DOCUMENTATION)  
CARD COUNT: NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 6/76  
REQUIRES 1200 FT. TAPE FOR DISTRIBUTION.

360D-23.0.001

COFAD: COMPUTERIZED FACILITIES DESIGN

AUTHOR: J. A. TOMPKINS

DIRECT INQUIRIES TO:

J. A. TOMPKINS

BOX 5511

NORTH CAROLINA STATE UNIVERSITY

RALEIGH, NORTH CAROLINA 27906

DESCRIPTION - COFAD II (COMPUTERIZED FACILITIES DESIGN) IS A COMPUTER PROGRAM DESIGNED TO DETERMINE SUBOPTIMAL LAYOUT AND HANDLING SYSTEMS FOR PHYSICAL FACILITIES. THE PROGRAM IS GOVERNED BY A SET OF HEURISTIC RULES WHICH ITERATIVELY SELECTS A LAYOUT AND THEN A HANDLING SYSTEM SO AS TO APPROACH THE MINIMAL MATERIALS HANDLING SYSTEM COST. COFAD II IMPROVES LAYOUTS IN A MANNER SIMILAR TO CRAFT BUT THEN DIFFERS SIGNIFICANTLY IN THAT REALISTIC MATERIALS HANDLING EQUIPMENT COSTS ARE INCLUDED SO AS TO ALLOW THE JOINT DETERMINATION OF THE LAYOUT AND HANDLING SYSTEM. INPUT INTO COFAD II INCLUDES THE FLOW DATA WITHIN THE FACILITY, THE COSTS OF ALTERNATIVE MATERIALS HANDLING EQUIPMENT TYPES AND AN INITIAL LAYOUT. COFAD II DIFFERS FROM THE ORIGINAL COFAD IN FLEXIBILITY, EASE OF ALTERING THE MODEL FOR VARIOUS PROBLEMS AND OUTPUT FORMAT. COFAD II IS WRITTEN IN FORTRAN IV AND CONTAINS APPROXIMATELY 3,300 CARDS. STORAGE OF 500K IS REQUIRED TO IMPLEMENT COFAD II.

PROGRAMMING LANGUAGE - FORTRAN IV

MINIMUM SYSTEM REQUIREMENTS - OS/FORTRAN IV

DOCUMENTATION: 10 PAGES, NO ADDITIONAL CHARGE.

CARD COUNT: 3,300 APPROXIMATE.

SUBMITTAL/REVISION DATE: 04/76

360D-23.0.002

CORELAP: COMPUTERIZED RELATIONSHIP LAYOUT PLANNING

AUTHOR: J. M. MOORE AND J. A. TOMPKINS

DIRECT INQUIRIES TO:

J. A. TOMPKINS

BOX 5511

NORTH CAROLINA STATE UNIVERSITY

RALEIGH, NC 27607

DESCRIPTION - CORELAP 9.3 (COMPUTERIZED RELATIONSHIP LAYOUT PLANNING) IS A COMPUTER PROGRAM DESIGNED TO GENERATE A LAYOUT FOR A FACILITY BASED UPON THE RELATIONSHIPS AMONG THE DEPARTMENTS WITHIN THE LAYOUT. CORELAP 9.3 CONSISTS OF A SELECTION ROUTINE AND A PLACEMENT ROUTINE. THE DEPARTMENTS ARE SELECTED AND PLACED IN AN EFFORT TO MAXIMIZE THE RELATIONSHIPS AMONG DEPARTMENTS AS INDICATED ON THE ORIGINALLY INPUT RELATIONSHIP CHART. CORELAP 9.3 DIFFERS FROM EARLIER VERSIONS OF CORELAP IN THAT A PLOTTER MAY BE UTILIZED TO PLOT THE FINAL LAYOUT. CORELAP 9.3 IS WRITTEN IN FORTRAN IV AND REQUIRES 200K OF STORAGE TO BE IMPLEMENTED.

PROGRAMMING LANGUAGE - FORTRAN IV

MINIMUM SYSTEM REQUIREMENTS - OS/FORTRAN IV

DOCUMENTATION: 7 PAGES, NO ADDITIONAL CHARGE.

CARD COUNT: 1,900 APPROXIMATE

SUBMITTAL/REVISION DATE: 04/76

360D-23.0.003

PLANET: PLANT LAYOUT ANALYSIS AND EVALUATION TECHNIQUE

AUTHOR: M. DEISENROTH AND J. A. TOMPKINS

DIRECT INQUIRIES TO:

J. A. TOMPKINS

BOX 5511

NORTH CAROLINA STATE UNIVERSITY

RALEIGH, NORTH CAROLINA 27607



CONTINUED FROM PRIOR COLUMN

DESCRIPTION - PLANET (PLANT LAYOUT ANALYSIS AND EVALUATION TECHNIQUE) IS A COMPUTER PROGRAM DESIGNED TO DETERMINE SUBOPTIMAL LAYOUT PATTERNS FOR PHYSICAL FACILITIES. PLANET IS A CONSTRUCTION ROUTINE WHICH CONSISTS OF THREE SELECTION ROUTINES AND A PLACEMENT ROUTINE. THE SELECTION ROUTINES DETERMINE THE ORDER IN WHICH DEPARTMENTS ARE TO ENTER THE LAYOUT, AND THE PLACEMENT ROUTINE DETERMINES WHERE TO PLACE THE DEPARTMENTS AS AS TO MINIMIZE HANDLING COSTS. THE INPUT OF FLOW DATA INTO PLANET MAY BE DONE IN ANY ONE OF THE THREE FOLLOWING WAYS: (1) EXTENDED PARTS MATRIX, (2) FROM-TO CHART, (3) PENALTY MATRIX. PLANET IS WRITTEN IN FORTRAN IV AND CONTAINS APPROXIMATELY 1,000 CARDS. STORAGE OF 160K IS REQUIRED TO IMPLEMENT PLANET.

PROGRAMMING LANGUAGE - FORTRAN IV

MINIMUM SYSTEM REQUIREMENTS - OS/FORTRAN

DOCUMENTATION: 10 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 1,000 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 04/76

360D-23.0.004

ALDEP: AUTOMATED LAYOUT DESIGN PROGRAM

AUTHOR: S. M. SEEHOF AND J. A. TOMPKINS

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NORTH CAROLINA STATE UNIVERSITY  
RALEIGH, NORTH CAROLINA 27607

DESCRIPTION - ALDEP (AUTOMATED LAYOUT DESIGN PROGRAM) IS A COMPUTER PROGRAM DESIGNED TO GENERATE AND EVALUATE LAYOUTS BASED UPON THE RELATIONSHIPS AMONG DEPARTMENTS WITHIN THE LAYOUT. ALDEP CONSTRUCTS SEVERAL LAYOUTS UTILIZING A RANDOM NUMBER GENERATOR AND A HEURISTIC SELECTION PROCEDURE. THE LAYOUTS RESULTING FROM ALDEP ARE EVALUATED AND ASSIGNED A RATING DEPENDING UPON THE ADHERENCE OF THE LAYOUT TO THE ORIGINALLY INPUT RELATIONSHIP CHART. ALDEP IS THE ONLY WIDELY USED ROUTINE WHICH ALLOWS THE INCLUSION OF MORE THAN SINGLE FLOOR FACILITIES. THE INPUT INTO ALDEP IS THE DEPARTMENTAL AREAS AND RELATIONSHIPS. ALDEP IS WRITTEN IN FORTRAN IV

CONTINUED FROM PRIOR COLUMN

AND CONTAINS APPROXIMATELY 700 CARDS. STORAGE OF 200K IS REQUIRED TO IMPLEMENT ALDEP.

PROGRAMMING LANGUAGE - FORTRAN IV

MINIMUM SYSTEM REQUIREMENTS - CS/FORTRAN IV

DOCUMENTATION: 9 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 700 APPROXIMATE.  
SUBMITTAL REVISION/DATE: 04/76

360D-23.1.003

TWO-STAGE, TWO-DIMENSIONAL TRIM PROGRAM II

AUTHOR: CAROL E. SHANESY

DIRECT TECHNICAL INQUIREIS TO:

CAROL E. SHANESY  
IBM NEW YORK PUBLIC SECTOR OFFICE  
77 WATER STREET  
NEW YORK, NY 10005

DESCRIPTION - TWO-STAGE, TWO-DIMENSIONAL TRIM PROGRAM PROVIDES A LINEAR PROGRAMMING SOLUTION TO THE TWO-STAGE TWO DIMENSIONAL TRIM OR CUTTING STOCK PROBLEM. THIS PROBLEM CAN BE DESCRIBED BRIEFLY AS FOLLOWS. WE HAVE A SUPPLY OF MATERIAL WHICH IS STOCKED (OR PRODUCED) IN ONE OR MORE FIXED RECTANGULAR SIZES, EACH SIZE HAVING A FIXED COST PER UNIT ASSOCIATED WITH IT. WE ALSO HAVE A LIST OF SMALLER RECTANGLE SIZES TOGETHER WITH THE NUMBERS DESIRED OF EACH SIZE, WHICH ARE TO BE PRODUCED BY CUTTING UP STOCK-SIZE RECTANGLES. IF ANY OF THESE RECTANGLE SIZES (W X L) MAY BE CUT EITHER W OR L OR L X W, THE PROGRAM WILL TAKE ADVANTAGE OF THIS FREEDOM. THE STOCK-SIZE RECTANGLES ARE CUT IN TWO STAGES -- FIRST THE RECTANGLE IS SLIT INTO STRIPS WITH STRAIGHT CUTS PARALLEL TO THE LENGTH EDGE, AND THEN EACH STRIP IS CUT INDIVIDUALLY IN THE PERPENDICULAR DIRECTION. THE CHEAPEST WAY OF CUTTING UP STOCK IS TO FILL THE ORDERS MUST BE DETERMINED. THE PROGRAM WILL HANDLE UP TO 10 STOCK SIZES AND 50 ORDER SIZES, AS PRESENTLY COMPILED. FOR THESE DIMENSIONS, THE PROGRAM REQUIRES ABOUT 100,000 BYTES OF MEMORY FOR EXECUTION.

PROGRAMMING SYSTEMS - IT IS AN INDEPENDENT ROUTINE, CODED ENTIRELY IN FORTRAN.

CONTINUED FROM PRIOR COLUMN

MINIMUM SYSTEM REQUIREMENTS - THERE ARE NO OTHER SPECIAL MACHINE REQUIREMENTS BEYOND THOSE FOR OS/360.

DOCUMENTATION: 37 PAGES, \$.85 ADDITIONAL CHARGE.  
CARD COUNT: 550 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 03/69

360D-23.4.004

360 APT - V4M3/SSX3A/SSIP

AUTHOR: QUINT RYGH

DIRECT TECHNICAL INQUIRIES TO:  
T. J. CASEY, CI-648 (2-56)  
DOUGLAS AIRCRAFT CO.  
3855 LAKEWOOD BLVD.  
LONG BEACH, CA 90846

DESCRIPTION - THIS PACKAGE EFFECTS A MERGER BETWEEN IBM'S 360 APT (V4M3) AND CAM-I'S SCULPTURED SURFACE (SSX3A) BY MEANS OF A SCULPTURED SURFACE INTERIM PROCESSOR (SSIP). THE PURPOSE OF THE MERGER WAS TO FACILITATE AND THEREBY TO ENCOURAGE WITHIN THE NC COMMUNITY A MORE EXTENSIVE EFFORT IN THE AREA OF SCULPTURED SURFACE RESEARCH AND DEVELOPMENT. THE CODING LANGUAGE IS FORTRAN IV EXCEPT FOR A MODICUM OF BASIC ASSEMBLY LANGUAGE IN V4M3. THE PACKAGE WAS PREPARED ON A 165/3330 UNDER CONTROL OF OS/MVT 21.7 BUT SHOULD BE EXECUTABLE UNDER ANY VERSION OF OS OR OS/V5 AND ON ANY 360/370 HARDWARE CAPABLE OF MEETING THE 310K CORE REQUIREMENT. THE APT PROCESSOR, OF WHICH THIS PACKAGE IS AN OFFSHOOT, IS COMPRISED OF FIVE SECTIONS, 0 THRU IV. THE PACKAGE, AS AVAILABLE, CONSISTS OF A LOAD MODULE FOR EACH OF THESE SECTIONS, A SOURCE MODULE FOR SECTION I, AN OVERLAY AND NINE TEST CASES, WHICH MAY BE USED TO VERIFY IMPLEMENTATION AND DEMONSTRATE CAPABILITIES. ATTENDANT DOCUMENTATION IS FOR THE USE OF THE APT PART PROGRAMMER AND SYSTEM IMPLEMENTOR.

PROGRAMMING LANGUAGE - FORTRAN IV, ASSEMBLER.

MINIMUM SYSTEM REQUIREMENTS - OS/360 OR OS/V5

DOCUMENTATION: 112 PAGES, \$4.60 ADDITIONAL CHARGE.  
CARD COUNT: NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 5/74.

370D-23.4.005

370 APT-AC (PTF3), APTLFT IMPLEMENTATION

AUTHOR: ROBERT J. HAUGEN

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
CURRENTLY NOT AVAILAABLE.

DESCRIPTION - THIS PACKAGE PROVIDES THE NECESSARY UPDATES, NEW PROGRAMS, OVERLAYS, TEST PROGRAMS, AND JCL TO IMPLEMENT AND TEST SYSTEM/370 APT-AC (PTF3) WITH APTLFT. ALL PREPARATION WAS DONE ON A S/370 MODEL 168 WITH 3330 DISK AND USING OS-MVT RELEASE 21.7.

PROGRAMMING LANGUAGE - FORTRAN IV AND ASSEMBLY LANGUAGE.

MINIMUM SYSTEM REQUIREMENTS - OS/360, 3330, FORTRAN IV, ASSEMBLER.

DOCUMENTATION: 78 PAGES, \$2.90 ADDITIONAL CHARGE.  
CARD COUNT:  
SUBMITTAL/REVISION DATE: 11/74.

360D-40.0.001

DFACT - DOUBLE PRECISION FACTORIAL

AUTHOR: H. E. SCHAFFER

DIRECT TECHNICAL INQUIRIES TO:  
DR. H. E. SCHAFFER  
NORTH CAROLINA STATE UNIVERSITY  
DEPT. OF GENETICS  
RALEIGH, N. C. 27607

DESCRIPTION - THIS SUBROUTINE RETURNS THE DOUBLE PRECISION VALUE OF FACTORIAL N. FOR NEGATIVE N, THE ABSOLUTE VALUE OF N IS USED AND AN ERROR INDICATION IS RETURNED. FOR N GREATER THAN 56 THE MAXIMUM FLOATING POINT VALUE IS RETURNED AND AN ERROR INDICATION IS RETURNED. (FACTORIAL 56 IS THE LARGEST FACTORIAL VALUE WHICH CAN BE REPRESENTED IN A FLOATING POINT WORD).

THIS SUBROUTINE IS VERY FAST SINCE THE FACTORIAL VALUES ARE FOUND BY A TABLE LOOK UP. THE TABULAR VALUES WERE

CONTINUED FROM PRIOR COLUMN

GENERATED EXACTLY IN HEXADECIMAL ARITHMETIC AND ROUNDED TO DOUBLE PRECISION LENGTH. THE ACCURACY OF THESE HEXADECIMAL TABULAR VALUES IS THUS THE MAXIMUM POSSIBLE IN A DOUBLE PRECISION WORD, AND IS NOT AFFECTED BY ANY INACCURACY IN THE CONVERSION OF DECIMAL CONSTANTS TO HEXADECIMAL.

PROGRAMMING SYSTEMS - THIS SUBROUTINE IS WRITTEN IN FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - ANY S/360 WITH FORTRAN IV (G OR H LEVEL), AND USES APPROXIMATELY 1,000 BYTES OF CORE AT OBJECT TIME.

DOCUMENTATION: 8 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: 39 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 03/68

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360D-40.0.003

INTFORT - INTERVAL ARITHMETIC INTERPRETER AND SUBROUTINE PACKAGE

AUTHOR: D. P. LAURIE

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
NOT CURRENTLY AVAILABLE.

DESCRIPTION - THE INTFORT INTERPRETER CONVERTS EXPLICIT TYPE DECLARATIONS, ASSIGNMENT AND ARITHMETIC IF STATEMENTS FOR INTERVAL VARIABLES TO EQUIVALENT FORTRAN STATEMENTS. A SUBROUTINE PACKAGE FOR PERFORMING THE INTERVAL ARITHMETIC IN SINGLE OR DOUBLE PRECISION IS PROVIDED. THE INTERPRETER IS ALSO SUITABLE FOR USE WITH ANY FANCY ARITHMETIC SUBROUTINES (E.G. MULTIPRECISION) THAT USE SYNONOMOUS SUBROUTINES FOR THE ARITHMETIC OPERATIONS.

PROGRAMMING LANGUAGE - PL/I, FORTRAN, ASSEMBLER - OS

MINIMUM SYSTEM REQUIREMENTS - OS/360

DOCUMENTATION: 18 PAGES, NO ADDITIONAL CHARGE.  
CARD COUNT: NOT AVAILABLE ON CARDS.  
SUBMITTAL/REVISION DATE: 10/73.

360D-40.4.003

MULTIPLE - PRECISION FLOATING-POINT ARITHMETIC PACKAGE

AUTHOR: J. R. EHRMAN

DIRECT TECHNICAL INQUIRIES TO:

DR. JOHN R. EHRMAN  
STANFORD CENTER FOR INFORMATION PROCESSING  
SLAC - EIN 97  
P.O. BOX 4349  
STANFORD, CALIFORNIA 94305

DESCRIPTION - THESE ROUTINES PROVIDE THE SYSTEM/360 PROGRAMMER WITH A SIMPLE MEANS FOR PERFORMING FLOATING-POINT ARITHMETIC TO ANY DESIRED PRECISION, AND IN A FORMAT COMPATIBLE WITH STANDARD SYSTEM/360 FLOATING-POINT FORMAT.

PROGRAMMING SYSTEMS - THE ROUTINES ARE WRITTEN IN ASSEMBLER LANGUAGE, AND ARE DESIGNED PRIMARILY FOR USE IN A FORTRAN ENVIRONMENT. HOWEVER, THEY MAY BE CALLED BY ANY PROGRAM WHICH OBSERVES STANDARD OS/360 PARAMETER-PASSING AND LINKAGE CONVENTIONS.

MINIMUM SYSTEM REQUIREMENTS - SAME AS THOSE REQUIRED TO RUN OS/360.

DOCUMENTATION: 24 PAGES, \$.20 ADDITIONAL CHARGE.  
CARD COUNT: 3,250 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 04/69

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360D-40.4.004

A MULTIPLE PRECISION PACKAGE FOR THE IBM OS 360/370 SYSTEMS

AUTHOR: DR. C. E. REID, UNIVERSITY OF FLORIDA

DIRECT TECHNICAL INQUIRIES TO:

H. D. KNOBLE  
COMPUTER BUILDING  
THE PENNSYLVANIA STATE UNIVERSITY  
UNIVERSITY PARK, PA 16802

DESCRIPTION - THIS SET OF PROGRAMS ENABLES MULTIPLE PRECISION ARITHMETIC TO BE PERFORMED IN A FORTRAN ENVIRONMENT ON IBM 360 OR 370 HARDWARE. THE PRECISION IS VARIABLE AND MAY BE SET BY THE PROGRAM TO CORRESPOND TO AS

CONTINUED FROM PRIOR COLUMN

HIGH AS 604 DECIMAL DIGITS; MAGNITUDE RANGE IS 4.13 E-78916 TO 6.29 E+78910. THE STANDARD ARITHMETIC OPERATIONS ARE SUPPORTED AS WELL AS MULTIPLE PRECISION FUNCTIONS CORRESPONDING TO ABS, SQRT, EXP, ALOG, SIN, AND COS. INPUT/OUTPUT CONVERSION ROUTINES ARE ALSO PROVIDED AS WELL AS A TRACING FACILITY TO ENABLE PROGRAM FLOW AND RESULTS TO BE PRINTED AS COMPUTATIONS PROCEED. THE PACKAGE WAS DEVELOPED AND TESTED WITH USE OF THE IBM OS 360 FORTRAN (G) LEVEL COMPILER. THE 26 PAGE PROGRAM WRITE-UP IS UPPER/LOWER CASE MACHINE READABLE.

PROGRAMMING LANGUAGE - OS/360 ASSEMBLER AND FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - S/360 - S/370

DOCUMENTATION: 4 PAGES, NO ADDITIONAL CHARGE.  
(PLUS MACHINE READABLE DOCUMENTATION)

CARD COUNT: 3,600 APPROXIMATE.

SUBMITTAL/REVISION DATE: 5/76

360D-42.2.001

EXPERIMENTAL PROGRAM FOR DETERMINING POLYNOMIAL ZEROS

AUTHORS: IRENE GARGANTINI W. MUNZNER

DIRECT TECHNICAL INQUIRIES TO:

DR. IRENE GARGANTINI  
DEPARTMENT OF COMPUTER SCIENCE  
UNIVERSITY OF WESTERN ONTARIO  
LONDON, ONTARIO N63K7  
CANADA

DESCRIPTION - THE PROGRAM DETERMINES SIMULTANEOUSLY ALL THE ZEROS OF A POLYNOMIAL TOGETHER WITH ERROR BOUNDS. IT IS POSSIBLE FOR THE USER TO FOLLOW HOW THE PROCEDURE WORKS THROUGHOUT THE ENTIRE PROGRAM BY REMOVING THE C FOR COMMENT IN THE WRITE STATEMENTS AND THE TWO SUBPROGRAMS PRINTS AND PRINTD. THIS PROGRAM IS NOT INTENDED TO BE OPTIMAL, NEITHER WITH REGARD TO PROGRAMMING NOR TO COMPUTING TIME. IT IS THE FIRST DIGITAL TECHNIQUE FOR SEARCHING ALL THE ZEROS THAT DOES NOT USE DEFLATION AND GIVES APPROXIMATIONS TO THE ZEROS WITH A PREDICTABLE DEGREE OF ACCURACY.

PROGRAMMING SYSTEMS - WRITTEN IN FORTRAN IV. OPERATES USING OS/360.

CONTINUED FROM PRIOR COLUMN

MINIMUM SYSTEM REQUIREMENTS - A SYSTEM/360 WITH AT LEAST 128K CORE STORAGE.

DOCUMENTATION: 40 PAGES, \$1.00 ADDITIONAL CHARGE.

CARD COUNT: 1,100 APPROXIMATE.

SUBMITTAL/REVISION DATE: 12/68

360D-43.2.001

MIDAS - AN ADAPTATION OF THE CONVAIR PRE-COMPILING MIDAS-III DIGITAL ANALOG SIMULATION SYSTEM TO OS/360 WITH CALCOMP PLOTTING

AUTHORS: G. H. BURGIN W. E. LOPER

DIRECT TECHNICAL INQUIRIES TO:

W. E. LOPER  
NAVAL ELECTRONICS LABORATORY CENTER  
ADVANCED SOFTWARE TECHNOLOGY DIVISION  
CODE 5200  
SAN DIEGO, CA 92152

DESCRIPTION - THIS MIDAS PROGRAM AND REPORT ARE ADAPTATIONS OF A PROGRAM (MIDAS-III) AND REPORT (GDC-DDE66-022) BY G. H. BURGIN OF GENERAL DYNAMICS, CONVAIR DIVISION, SAN DIEGO, CALIFORNIA. THE CONVAIR VERSION WAS A CONTINUATION OF DEVELOPMENTS IN SIMULATION OF ANALOG COMPUTER ORIENTED DESCRIPTIONS OF SYSTEMS OF DIFFERENTIAL EQUATIONS BEGINNING WITH MIDAS ORIGINALLY PRODUCED BY WRIGHT-PATERSON AIR FORCE BASE AND MIDAS-II BY NORTH AMERICAN AVIATION. THE CONVAIR VERSION WAS A CONTRIBUTION TO THE 7094 LITERATURE IN THAT IT WAS A PRE-COMPILER IN CONTRAST TO THE PREVIOUS INTERPRETERS WHICH WERE AN ORDER OF MAGNITUDE SLOWER IN EXECUTION. THIS PROGRAM AND ITS SUPPORTING DOCUMENTATION MODIFY ONLY THAT WHICH IS NECESSARY TO ACCOMMODATE SPECIFIC DIFFERENCES IN COMPUTERS, OPERATING SYSTEMS, AND PERIPHERAL EQUIPMENT DIFFERENCES BETWEEN NWCL AND CONVAIR.

PROGRAMMING SYSTEMS - RUNS UNDER OPERATING SYSTEM/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 MODEL 50, OPERATING SYSTEM CONFIGURATION.

DOCUMENTATION: 58 PAGES, \$1.90 ADDITIONAL CHARGE.

CARD COUNT: 6,650 APPROXIMATE.

SUBMITTAL/REVISION DATE: 12/67

360D-45.0.001

PL/I SUBPROCEDURE COLLECTION - RELEASE 1

AUTHOR: H. R. HAMILTON

DIRECT TECHNICAL INQUIRIES TO:

H. R. HAMILTON  
 COMPUTING CENTER  
 P. O. BOX 5445  
 N. C. STATE UNIVERSITY  
 RALEIGH, NORTH CAROLINA 27607

DESCRIPTION - THE SUBPROCEDURE COLLECTION (SPC) IS A LIBRARY OF SUBPROCEDURES WRITTEN IN PL/I FOR USE BY PL/I PROGRAMS. THIS RELEASE OF THE SPC CONTAINS ABOUT 170 PROCEDURES MOSTLY IN THE AREA OF MATHEMATICS; MOSTLY, LINEAR ALGEBRA.

SOME OF THE PROCEDURES IN THIS COLLECTION REPRESENT ORIGINAL ALGORITHMS AND ORIGINAL CODE. SOME WERE TAKEN FROM THE ALGORITHMS SECTION OF "COMMUNICATIONS OF THE ACM". SOME ARE ADOPTED FROM THE IBM SCIENTIFIC SUBROUTINE PACKAGE (PL/I). CURRENTLY, THE MAJORITY ARE IMPLEMENTATIONS OF ALGORITHMS FROM THE "HANDBOOK FOR AUTOMATIC COMPUTATION, VOL 2, LINEAR ALGEBRA" BY WILKINSON AND REINSCH (SPRINGER-VERLAG, 1971). THIS LATTER GROUP ARE SIMILAR TO THE SUBROUTINES COMPRISING EISPAC FORTRAN CODE DISTRIBUTED BY ARGONNE LABS.

ALL PROCEDURES WERE DEVELOPED IN AN OPTIMIZER/CHECKOUT COMPILER ENVIRONMENT. NO DELIBERATE STEPS WERE TAKEN TO BE COMPATIBLE WITH PL/I(F), BUT NOTHING DELIBERATE WAS DONE NOT TO BE.

PROGRAMMING LANGUAGE - PL/I

MINIMUM SYSTEM REQUIREMENTS - PL/I COMPILER

DOCUMENTATION: 175 PAGES, \$7.75 ADDITIONAL CHARGE.  
 CARD COUNT:  
 SUBMITTAL/REVISION DATE: 2/75

360D-99.0.002

NARGS - NUMBER OF ARGUMENTS

AUTHOR: MR. P. WOLFGANG

DIRECT TECHNICAL INQUIRIES TO:

TECHNICAL ASSISTANCE  
 CURRENTLY NOT AVAILABLE.

DESCRIPTION - NARGS IS A PROGRAM TO DETERMINE THE NUMBER OF ARGUMENTS SUPPLIED TO A SUBROUTINE OF FUNCTION. IT ASSUMES THE STANDARD OS/360 CALLING LINKAGE. IT SHOULD NOT BE CALLED FROM A MAIN PROGRAM. THE VALUE OF DUMMY IS IGNORED ON ENTRY AND SET EQUAL TO THE VALUE OF THE FUNCTION. NARGS MAY THEREFORE BE CALLED AS A SUBROUTINE.

PROGRAMMING SYSTEMS - WRITTEN IN ASSEMBLY LANGUAGE AND REQUIRES OS/360.

MINIMUM SYSTEM REQUIREMENTS - THOSE REQUIRED FOR OS/360.

DOCUMENTATION: 6 PAGES, NO ADDITIONAL CHARGE.

CARD COUNT: 29 APPROXIMATE.

SUBMITTAL/REVISION DATE: 04/68

360D-99.0.009

PROGRAM COLLECTION: STRUCTURED PROGRAMMING, UTILITIES, TRANSLATORS, SIMULATOR, HASP MODIFICATIONS, AND MACROS

AUTHOR: DONALD S. HIGGINS

DIRECT TECHNICAL INQUIRIES TO:

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 B-3  
 FLORIDA POWER CORPORATION  
 P.O. BOX 14042  
 ST. PETERSBURG, FL 33733

DESCRIPTION - THE FOLLOWING COLLECTION OF PROGRAMS ARE INCLUDED IN A SINGLE DISTRIBUTION PACKAGE:

GENERAL PURPOSE ASSEMBLER MACROS - SUBENTRY + SUBEXIT,  
 STANDARD LINKAGE WITH REENTRANT OPTIONS; EDIT PACKED DATA  
 USING A MASK; EQUAL, COMMONLY USED EQU'S; PERFORM, PENTRY,  
 PEXIT - STRUCTURED PROGRAMMING BLOCK CONCATENATION USING NO

CONTINUED FROM PRIOR COLUMN

REGISTERS; IF, ELSE, FI - STRUCTURED PROGRAMMING ALTERNATE BLOCK SELECTION; DOCASE, CASE, ESAC, ESACOD - STRUCTURED PROGRAMMING MULTIPLE ALTERNATE BLOCK SELECTION; ACCEPT + DISPLAY SIMPLIFIED I/O; DCWV - DEFINE V TYPE ADDRESS FOR DYNAMIC SUBROUTINES.

RENUMBER - PROGRAM RENUMBERS FORTRAN IV SOURCE PROGRAM AND PRINTS CROSS REFERENCE.

STRUCTURED FORTRAN TRANSLATOR - TRANSLATE A STRUCTURED GOTO-LESS FORTRAN PROGRAM WRITTEN IN STRUCTURED FORTRAN INTO ANS FORTRAN. LANGUAGE EXTENSIONS INCLUDE NESTED IF-ELSE-FI; NESTED DO WHILE, DO UNTIL, DO-OD; NESTED DOCASE, CASE, ESAC, ESACOD; NESTED PERFORM (PM)-PENTRY-PEXIT.

STRUCTURED FORTRAN TRANSLATOR - THE TRANSLATED VERSION OF THIS TRANSLATOR CAN BE USED ON ANY FORTRAN MACHINE.

SAMPLE ASSEMBLER PROGRAM USING STRUCTURED PROGRAMMING MACROS AND REENRANT LINKAGE TO SOLVE THE 8 QUEENS CHESS PROBLEM.

TAPESTRY - GENERAL UTILITY TO LIST, DUMP, OR COPY PORTIONS OF ANY TAPE FILE, REGARDLESS OF THE TYPE OF LABEL ON THE TAPE AND THE POSITION ON THE TAPE. OUTPUT FORMAT SAME AS OS ABEND DUMP.

COPYSOME - UTILITY TO SELECT AND COPY, BY RECORD, ANY SEQUENTIAL FILE.

FPCLABEL - LABELS ANY NEW TAPE OR NON-STANDARD LABEL TAPE WITH A STANDARD LABEL AS DEFINED FOR YOUR INSTALLATION WITH YOUR OWN INSTALLATION ID.

TRAN3705 - READS THE OUTPUT OF A SUPERZAP DUMP AND GENERATES 80 BYTE 3705 ASSEMBLY LANGUAGE STATEMENTS WHICH CAN BE FED INTO THE 3705 ASSEMBLER TO GENERATE A CROSS-REFERENCE TO ASSEMBLY LISTING OF A 3705 EMULATOR.

HASPMODS - HASPGEN PARAMETERS AND MODS FOR 3.1. INCLUDES MOD TO PURGE PROCESSOR TO COLLECT ALL CONSOLE MESSAGES AND ALL SMBS ON A DUMMY SYSOUT FILE MAINTAINED ON THE HASP SPOOL PACK. THIS SYSOUT CAN THEN BE DUMPED TO A SEQUENTIAL QSAM FILE BY A PREVIOUSLY MENTIONED UTILITY, AND NUMEROUS ANALYSIS PROGRAMS CAN BE RUN ON THE SMB AND CONSOLE RECORDS. SECOND HASP MOD CONSISTS OF A \$DC COMMAND TO DISPLAY THE FIVE LARGEST CONTIGUOUS REGIONS IN MVT. THIRD MOD IS A \$DW COMMAND TO DISPLAY OUTSTANDING RQES AGAINST IOS MVT TO DETECT LOST INTERRUPTIONS.

PDSDLIST - UTILITY WILL LIST THE DIRECTORY ENTRIES OF ANY

CONTINUED FROM PRIOR COLUMN

NUMBER OF PDS LIBRARIES IN ASCENDING ORDER -- 780 PER PAGE.

PDSMLIST - UTILITY LISTS THE MEMBERS OF ANY PDS SOURCE LIBRARY IN ALPHABETIC ORDER WITH SELECTION CONTROL. GETPDSDE - SUBROUTINE SEQUENTIALLY ACCESSES MEMBERS OF A PDS IN ALPHABETIC ORDER.

DEBUG AID - PROGRAM TRAPS ANY USER DATA EXCEPTIONS, PRINTS AN ERROR MESSAGE, NOPS THE FAILING INSTRUCTION AND CONTINUES

DEBUG AID - PROGRAM PERMITS THE FOLLOWING STEPS TO BE PERFORMED AT EXECUTION TIME: LOAD A PROGRAM INTO CORE, VERIFY AND/OR REPLACE DATA IN THE LOADED PROGRAM BY RELATIVE ADDRESS, EXECUTE THE MODIFIED PROGRAM, AND LOAD AND DUMP ANY PROGRAM.

COPYSPOL - UTILITY PROGRAM WHICH WILL SELECTIVELY DUMP TO A QSAM FILE THE PRINT RECORDS CONTAINED ON A HASP SPOOL PACK FOR A JOB WHICH IS WAITING FOR PRINT.

LISTHQUE - UTILITY PROGRAM TO PRINT THE HASP QUEUE IN BATCH MODE BY READING THE CHECK POINT RECORD ON THE HASP SPOOL PACK.

TVOLCOPY - COPIES ANY STANDARD LABEL TAPE VOLUME TO ANY OTHER STANDARD TAPE VOLUME.

SIM370 - USES A SPIE MACRO TO SET UP AN ENVIRONMENT IN WHICH A USER PROGRAM CAN BE EXECUTED WHICH CONTAINS 370 INSTRUCTIONS RUNNING ON A 360 -- INTERCEPTS AND SIMULATES 370 INSTRUCTIONS.

TEXTEDIT - BATCH TEXT EDIT UTILITY WHICH ALLOWS SCANNING 80 BYTE RECORD FILES, SEARCHING FOR ANY NUMBER OF STRINGS OF TEXT AND LISTING AND REPLACING STRINGS.

UNITNAME - UTILITY TO EXAMINE THE UCB TABLES ON THE HOST SYSTEM AND PRODUCE A SOURCE PROGRAM WHICH CAN BE USED TO ASSEMBLE THE DEVICE NAME AND THE DEVICE MASK CSECTS WHICH ACTUALLY DEFINE THE UNIT NAMES WHICH CAN BE USED TO REFERENCE DEVICES.

GETPDSDD - SUBROUTINE ACCESSES PDS DD STATEMENTS SEQUENTIALLY.

PDSCLIST - UTILITY SCANS PDS LOAD MODULE LIBRARY. IT LISTS EACH MEMBER AND THE CSECTS CONTAINED IN THAT MEMBER AND WILL THEN PERFORM AN INTERNAL SORT AND PRODUCE ANOTHER LIST CONSISTING OF EACH CSECT FOLLOWED BY ALL THE MEMBERS IN WHICH THIS CSECT OCCURS.

CONTINUED FROM PRIOR COLUMN

MRCLEAN - SET OF UTILITY PROGRAMS WHICH WILL PULL ALL THE DSCB RECORDS OFF OF ANY 3330 VOLUME AND CREATE A SEQUENTIAL FILE OF THESE DSCBS. PROGRAM SCANS SEQUENTIAL DSCB FILE AND SCRATCHES ALL TEMPORARY DATA SETS NOT CURRENTLY IN USE BY A PROGRAM IN EXECUTION. PROGRAM READS SEQUENTIAL FILE OF DSCBS AND PRINTS CONDENSED LISTING IN ALPHAEETICAL ORDER.

DSNLIST - PRINTS REPORT OF CATALOGED DATA SETS WITH CATALOG INFORMATION -- INTERFACES WITH MRCLEAN.

GETCATLG - READS SYSTEM CATALOG AND CONNECTED CATALOG IN ASCENDING DATA SET NAME ORDER.

LISTMACS - UTILITY TO SCAN ANY ASSEMBLER SOURCE FILE AND LIST OCCURRENCES OF ALL MACROS AND/OR INSTRUCTIONS IN THAT ASSEMBLER SOURCE.

CHKREORG - DETERMINES IF REORGANIZATION OF PDS OR ISAM FILE IS NEEDED BY COMPARING NUMBERS IN PARM FIELD AGAINST PDS RELATIVE EOF TRACK NUMBER OR ISAM CVERFLOW RECORD COUNT.

REREAD - SUBROUTINE ALLOWS FORTRAN PROGRAMS TO REREAD THE SAME INPUT RECORD UNDER DIFFERENT FORMATS.

MVCL - SUBROUTINE ALLOWS FORTRAN PROGRAMS TO MOVE ARRAY DATA WITH THE MOVE LONG INSTRUCTION. MAY ALSO BE USED TO INITIALIZE ANY ARRAY WITH ANY CHARACTER VALUE.

KWIC - SUBROUTINE SIMPLIFIES GENERATION OF KEY WORD IN CONTEXT (KWIC) DATA. EACH TIME IT IS CALLED IT ROTATES A FIELD TO THE NEXT KEY WORD IN THE FIELD.

KWIC GENERATION - UTILITY READS ANY SEQUENTIAL FILE AND CREATES AN OUTPUT FILE WITH AS MANY COPIES OF EACH RECORD AS THERE ARE KEYWORDS IN A KEYWORD FIELD DEFINED BY A CONTROL CARD. OUTPUT FILE CAN BE SORTED ON KEYWORD FIELD TO GENERATE KWIC REPORT.

CLCL - SUBROUTINE ALLOWS FORTRAN PROGRAMS TO COMPARE ARRAY DATA OF ANY LENGTH WITH THE COMPARE LONG INSTRUCTION.

BY NAME CALL - THREE SUBROUTINES ALLOW FORTRAN, COBOL, AND ASSEMBLER TO DYNAMICALLY CALL AND/OR CANCEL SUBROUTINES OR PROGRAMS AT EXECUTION TIME.

MPS - MESSAGE PROCESSING SUPERVISOR FOR USE WITH TCAM OR SIMILAR TELECOMMUNICATIONS LINE CONTROL PROGRAM. ALLOWS TP APPLICATION PROGRAMS TO BE WRITTEN IN COBOL, FORTRAN, OR ASSEMBLER USING A SIMPLE SUBROUTINE INTERFACE; ALLOWS USER

CONTINUED FROM PRIOR COLUMN

TO START AND STOP MESSAGE PROCESSING PROGRAMS AT WILL WITH SIMPLE COMMANDS. SUPERVISOR HAS A LOG FACILITY. CAN BE RUN IN BATCH MODE TO TEST NEW TP APPLICATIONS OR MODIFICATIONS.

BISAMSET - SUBROUTINE PERFORMS SAME FUNCTION FOR BISAM THAT SETL MACRO PROVIDES FOR QISAM.

PROGRAMMING LANGUAGES - FORTRAN, COBOL, AND ASSEMBLER.

MINIMUM SYSTEM REQUIREMENTS - OS (MFT, MVT, VS2-1.7)

DOCUMENTATION: 68 PAGES, \$2.40 ADDITIONAL CHARGE  
CARD COUNT: 16,000 APPROXIMATE.  
SUBMITTAL/REVISION DATE: 12/74.

END OF ABSTRACTS