



Systems Reference Library

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**Catalog of Programs for IBM 705-1410-7010  
7070-7072-7074-7080-7740 and 7750  
Data Processing Systems  
December 1965**

This Catalog contains a complete listing of all programs available for the IBM 705, 1410, 7010, 7070, 7072, 7074, 7080, 7740 and 7750 Data Processing Systems. It obsoletes the previous edition of this Catalog, Form No. C20-1602-2, and its Supplement Form No. N20-0014-4.

Instructions for ordering magnetic tape programs are contained in the section of the Introduction entitled, "How to Order Programs".

This Catalog contains the following sections:

1. Introduction and instructions on how to use the catalogs and how to order the programs.
2. A list of corrections and revisions to announced programs (if applicable).
3. A Keyword-in-Context (KWIC) Index.
4. Abstracts of all available programs.
5. A list of deletions (if applicable).

All programs listed in this Catalog should be ordered through your local IBM Branch Office.

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## INTRODUCTION

The Catalogs for the systems listed below, with their form numbers, are currently available from IBM Branch Offices. Individually updated supplemental issues of all Catalogs will be published under the form numbers indicated and can be obtained from IBM Branch Offices as they are published.

<u>Title</u>	<u>Catalog Form No.</u>	<u>Supplement Form No.</u>
Catalog of Programs for IBM 305 and 650 Data Processing Systems	C20-1600	N20-0012
Catalog of Programs for IBM 1240, 1401, 1420, 1440, and 1460 Data Processing Systems	C20-1601	N20-0013
Catalog of Programs for IBM 705, 1410, 7010, 7070, 7072, 7074, 7080, 7740 and 7750 Data Processing Systems	C20-1602	N20-0014
Catalog of Programs for IBM 1620 and 1710 Data Processing Systems	C20-1603	N20-0015
Catalog of Programs for IBM 704, 709, 7040, 7044, 7090 and 7094 Data Processing Systems	C20-1604	N20-0016
Catalog of Programs for IBM System/360	C20-1619	N20-0030

This Catalog contains a complete listing of all programs available for the IBM 705, 1410, 7010, 7070, 7072, 7074, 7080, 7740 & 7750 Data Processing Systems. It obsoletes the previous edition of this Catalog and its Supplements.

To assist you in using this Catalog, the abstracts are listed by file number in numeric and alphabetical sequence.

## TYPES OF PROGRAMS

### Type I

Programming Systems are conceived and developed by IBM as integral parts of the data processing system for which they are written.

### Type II

Application Programs are carefully selected solutions by IBM of data processing problems. They are supported by well-planned documentation and tested procedures.

Both types of programs are maintained by IBM and modifications will be supplied automatically to all users of specific programs by the Program Information Department. Abstracts for Type I and Type II programs are contained in the "IBM Programs" Section of this Catalog.

### Type III

IBM-Contributed Programs are contributed voluntarily by IBM employees to aid the programming and system community.

### Type IV

Customer-Contributed Programs are valuable aids to the programming and systems community supplied by members of customer organizations and individual users of IBM Data Processing Systems.

IBM serves solely as the distribution agent for Type III and Type IV programs. Abstracts for Type III and Type IV programs are contained in the "Contributed Programs" Section of this Catalog.

## CUSTOMER ORGANIZATIONS

Customer organizations take part in the exchange of programming and systems information.

The GUIDE Organization is directed toward a mutual development and exchange of Data Processing Applications on the IBM 705, 1410, 7010, 7070, 7072, 7074, and 7080 Data Processing Systems and their successors. Certain models of System/360 have been adopted by GUIDE. GUIDE members gain valuable experience through the consolidation and dissemination of technological and programming data.

STANDARDS FOR TYPE IV (CUSTOMER CONTRIBUTED) PROGRAMS

Programs written by customer personnel must conform to established standards and procedures. These criteria differ according to the machine system for which the program is written. Copies of standards and procedures for Type IV (Customer Contributed) Programs are available through your local IBM Branch Office.

HOW TO ORDER PROGRAMS

Domestic Customers

All Programs listed in this Catalog should be ordered through your local IBM Branch Office.

Magnetic tapes will be duplicated at 556 characters per inch unless a different density is specified by the requestor. A full reel of tape, containing 2400 feet, should be submitted. Be sure to check the abstract for the exact number of tapes required when requesting a magnetic tape program.

The Program Information Department's objective is to complete the in-house

processing of a program request within ten (10) working days of its receipt by the department.

IBM World Trade Users

World Trade users should order programs by contacting their IBM representative.

KEYWORD-IN-CONTEXT INDEX

The Keyword-in-Context Index lists available programs arranged alphabetically by the keywords in the program titles. There is an index entry for each significant keyword in the title. Certain words are not accepted as indexing words but will be printed as part of the title. The complete "Stop List" of words not accepted for indexing is included below under the heading "Words Prevented from Indexing".

This KWIC Index was prepared by highlighting each keyword of the title in the context of words on either side of it and aligning the keywords of all titles alphabetically in a vertical column. The following example will illustrate the operation:

TITLE	SYSTEM FILE NO.	PAGE
#ABBREVIATED PRINT I TRACING ROUTINE	0705 04.2.002	021
CONTROL FIELDS INTO ACTUAL DISK #CONVERSION OF DATA	1410 02.4.001	023
#ADAPT 1401 COMPILER	0705 01.2.002	021
PRECISION FLOATING ADD #DOUBLE	7070 08.4.003	030
PRECISION FLOATING ADD SUBROUTINE #DOUBLE	7070 08.4.007	030
XX. #MACRO ADD XX, SUBTRACT XX, MULTIPLY XX, DIVIDE	1410 03.9.001	024
/7340 CAPABILITIES ADDED/, FOR #FORTRAN LOADER-PACKAGE	7070 FO-149	009
# ADDRESSES V 1301	1410 02.4.001	023
#EVALUATION OF ADDRESSING TECHNIQUES	1410 03.2.004	023
WRITE #INVALID ALPHA SEARCH PROGRAM FOR TAPE CHECKPOINT	7070 03.9.001	028
#APTS 80	0705 AT-057	001
#ARCTANGENT SUBROUTINE	7070 08.1.010	030
MERICAL INTEGRATION AREA /F/ #NU	7070 09.5.002	031
ORDER DECISION TABLE ASSEMBLER #AUTOC	7070 01.1.002	026
#SYMBOLIC ASSEMBLY FOR 1401	0705 01.1.002	021
#0705/1401A ASSEMBLY PROGRAM	0705 CV-045	001
ROGRAM #AUTO-CORRELATION AND CROSS-CORRELATION P	7070 11.2.002	034
#AUTO-COVARIANCE, POWER SPECTRUM	7070 11.2.001	034
#AUTO-TEST GENERATOR	7070 04.3.003	028
#7070/7074 AUTOCHART	7070 AD-151	008
# COMPILER SYSTEMS AUTOCODER	7070 03.9.002	028
#BASIC AUTOCODER	7070 AU-072	008
#AUTOCODER DECISION TABLE ASSEMBLER	7070 01.1.002	026
#AUTOCODER MACROS	1410 01.9.001	022
#AUTOCODER 74	7070 AU-074	009
AT -- PROCEDURE FOR AUTOMATIC TESTING #P	7070 AT-082	008
METHODS AND STANDARDS AUTOMATION #M.A.S.A. ME	7080 07.9.001	037

Notice that the # sign always precedes the first word of the title. A title that is longer than 59 characters will show only the characters that fall on either side of the keyword being highlighted, up to the limits of one line. The complete title may be found in the Abstract section. The slash (/) is used in place of parentheses. The # placed two spaces in front of the first word indicates that the entry is the second part of a two-line title.

#### PROGRAM CLASSIFICATION CODES

Included below is a complete listing of classification codes for all types of programs and for each system included in this Catalog. The Programming Systems (Type I) and Application Programs (Type II) abstracts appear in the "IBM Programs" Section of this Catalog; the IBM-Contributed Programs (Type III) and Customer-Contributed Programs (Type IV) appear in the "Contributed Programs" Section of this Catalog.

In addition to assisting you in locating the abstract of each program, this list should prove useful in classifying programs written by IBM or customer personnel and contributed to the program libraries.

#### Programming Systems Type I

/AD/	Autochart
/AS/	Assembly Systems
/AT/	Automatic Test
/AU/	Autocoder
/CB/	COBOL - Common Bus. Oriented Language
/CT/	Commercial Translator
/CV/	Conversion Programs
/DN/	Diagnostic Programs
/FO/	FORTRAN - Formula Translation
/IO/	Input/Output
/LM/	Library Material
/MI/	Miscellaneous
/PR/	Processor - Includes AU, CB, I/O, etc.
/RG/	Report Generators
/SI/	Simulator Programs
/SM/	Sort/Merge
/SP/	Symbolic Assembly Programs
/SV/	Supervisory Systems
/UT/	Utility Programs

#### Application Programs Type II

##### Distribution

/DP/	Publishing
/DR/	Retail
/DW/	Wholesale

#### Fabrication and Assembly

/CN/	Numerical Control Applications
/CX/	Other
/EE/	Electrical Engineering
/EO/	Optics
/EX/	Other
/ME/	Electrical and Machinery

#### Process

/MP/	Petroleum and Industrial Chemicals
/MT/	Textiles and Paper

#### Service Industries

##### Finance

/FB/	Banking
/FI/	Brokerage and Investment

##### Information Retrieval

/CR/	Information Retrieval
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##### Insurance

/IF/	Fire and Casualty
/IL/	Life

##### State and Local Government

/UG/	Government, State and Local
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##### Transportation

/ST/	Transportation
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##### Utilities

/SU/	Utilities
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##### Federal Region

/GF/	Government, Federal
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##### Scientific Industries

##### Aerospace

/MA/	Aerospace
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##### Education

/US/	Secondary Schools
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##### Medical

/UH/	Hospital and Medical
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##### Scientific Marketing

/CA/	Statistical Applications
/CO/	Operations Research

/CP/	Critical Path Scheduling	Scientific and Engineering Applic. 7.0
/CM/	Mathematical Applications	7.1 Nuclear Engineering
/EC/	Civil Engineering	7.2 Civil Engineering
/MF/	Fabrication and Primary Metals	7.3 Hydraulic and Gas
		7.4 Petroleum
		7.5 Chemical
Cross Industry		7.6 Electrical Engineering
Communications		7.9 General
/SC/	Communications	Elementary Functions & Prog. Arith. 8.0
Simulators		8.1 Trigonometric
/CS/	Simulators	8.2 Hyperbolic, Exponential, and Logarithmic
Systems Engineering Techniques		8.3 Roots and Powers of Monomials
/SE/	Systems Engineering	8.4 Interpretive Floating Point Arithmetic
		8.5 Complex Arithmetic
		8.6 Interpolation
		8.9 Other
<u>Type III and Type IV Programs</u>		
Programming Systems 1.0		Higher Mathematical Functions 9.0
1.1 Assemblers		9.1 Polynomial and Related Routines
1.2 Compilers		9.2 Special Functions
1.3 Input/Output Control		9.3 Numerical Solution of Ordinary Differential Equations
1.4 Interpretive Systems		9.4 Numerical Solution of Partial Differential Equations
1.9 Other		9.5 Numerical Integration
		9.9 Other
Data Handling 2.0		Operations on Matrices, Vectors, and Simultaneous Linear Equations 10.0
2.1 Sorting		10.1 Matrix Operations
2.2 Merging		10.2 Eigenvalues and Eigenvectors
2.3 Report Generation		10.3 Determinants
2.4 Data Conversion		10.4 Simultaneous Linear Equations
2.5 Table Operations		10.9 Other
2.6 Information Retrieval		Statistical Applications 11.0
2.7 Tele-processing (1410 and 7010 and 7740 and 7750)		11.1 Curve Fitting and Smoothing
2.9 Miscellaneous		11.2 Auto Correlation
		11.3 Correlation and Regression Analysis
Utility Routines 3.0		11.4 Sequential Analysis
3.1 Loading		11.5 Analysis of Variance
3.2 Supervisory		11.7 RanCom Number Generators
3.3 Clear Memory		11.9 Other
3.4 Tape Handling		Business and Commercial Applic. 12.0
3.5 Disk Handling		12.1 Inventory Control
3.9 Miscellaneous		12.2 Production Scheduling
Testing and Debugging Routines 4.0		12.9 Other
4.1 Dumping		Demonstration Programs 13.0
4.2 Tracing		13.1 Display
4.3 Test Data Preparation		13.2 Participation
4.4 Testing Systems		Management Science 14.0
4.9 Miscellaneous		14.1 Simulations
Hardware Simulation 5.0		14.2 Numerical Controls
5.1 Inter-Machine		14.3 Other
5.2 Intra-Machine		
Operations Research 6.0		Unclassified 99.0
6.1 Linear Programming Routines		
6.2 Non-Linear Programming Routines		

USING THE CATALOG

To locate a program begin by thinking of the significant words describing the desired program. Then look in the KWIC, Keyword-in-Context, Index for the keyword entry. The page number adjacent to the file number will then direct you to the corresponding program abstract. The reference code is set up as follows:

<u>System</u>	<u>File No.</u>
7070	FO 149
1410	02.4.001

The number of the IBM system for which the program is written.      The IBM Library code for filing and ordering a program.

Now refer back to the illustration in the section entitled, "Keyword-in-Context Index". As you can see, there are two kinds of file numbers: The first consists of an alphabetical and numeric reference; the second is completely numeric in a Dewey Decimal sequence.

Type I and II program abstracts are located in the "IBM Programs" section of this Catalog; Type III and IV program abstracts are located in the "Contributed Programs" section.

The page number listed at the end of the KWIC entry line will direct you to the program abstract. Each abstract describes the relevant program in enough detail to help you determine if the program will meet your requirements.

PROGRAM CORRECTIONS AND REVISIONS

There are two kinds of revisions to programs listed in this Catalog:

1. Changes in the program abstract
2. Functional changes in the program documentation and/or changes in the card decks and tapes.

Abstract changes for all Types of programs are noted in this Catalog and in the Supplement. The following codes appear at the extreme right-end of the title line for each abstract that is new or has been revised in this edition:

- \*N - This symbol indicates a new program
- \*M - This symbol indicates that the title of the program has been modified when it appears only at the extreme right end of the title line.
- \*M - This symbol indicates that the text of the abstract has been modified when an additional

\*M or \* alone appears, at the extreme right end of each line of the abstract that has been modified.

\*R - This symbol indicates that the entire text of the abstract has been revised.

Functional changes in program documentation and/or decks or tapes for Type III (IBM Contributed) and Type IV (Customer Contributed) programs are listed in a special table preceding the KWIC Index. This data is listed under three headings: program number; machine system area; and the date the correction was effective. If a user has received the program data prior to the date indicated and would like to receive the correction, he must reorder the program. See the section entitled, "How to Order Programs".

Information concerning functional changes in program documentation and/or decks or tapes for Type I (Programming Systems) and Type II (Application Programs) can be obtained through your IBM Branch Office.

DELETED PROGRAMS

This section contains a list of programs that have been removed since the August Supplement to the Catalog, Form Number N20-0014-4. These Programs are listed in sequence by machine systems and file number.

Included in the listing is an alphabetical heading, "Reason for Removal". This letter refers to a key that indicates the specific reasons for removing the program from the Catalog.

Alphabetical Key to Reason for Removal

- A - This program has been deleted because of low usage.
- C - This program has been deleted due to limited usefulness.
- D - This program is obsolete and replaced by file number: \_\_\_\_\_.

Programs deleted by the letter "D" are followed by a file number code. This code is the file number of the program that replaces the deleted program.

An abstract for the replacement program may be found in the "Abstracts of Available Programs" Sections in this Catalog.

LIST OF PROGRAM CORRECTIONS & REVISIONS

Program Number	Machine Area	Date
14.9.001	1410	09-15-65

WORDS PREVENTED FROM INDEXING

For the purpose of this index the following words are considered to be too general to be useful for retrieval purposes and are therefore prevented from indexing. This list may be modified

as needed to make the index more useful. Note that hyphenated words are treated as one index word, with only the first word being significant.

A	BUT	GAVE	NEWLY	SURVEY
ABOUT	BY	GIVE	NEXT	SYSTEM
ABOVE	C	GIVEN	NINE	SYSTEMS
ACCOMPANYING	CALLED	GIVES	NO	T
ACCORDING	CAN	GIVING	NOT	TAKE
ACHIEVED	CAPABLE	GENERAL	NOW	TAKEN
ACHIEVES	CAPABILITY	GENERALLY	O	TAKING
ACHIEVEMENTS	CAPABILITIES	GOOD	OBSERVED	TECHNIQUE
ACQUIRED	CAUSE	GREATER	OBTAINABLE	TECHNIQUES
ACROSS	CAUSES	GREATLY	OBTAINED	TEN
ADAPTATION	CAUSED	GUIDE	OBTAINING	THAN
ADDITIONAL	CAUSING	H	OCCURRING	THAT
ADVANTAGE	CERTAIN	HAD	OF	THE
ADVANTAGES	CHALLENGE	HAS	OFF	THEIR
AFFECT	CHIEF	HAVE	ON	THEM
AFFECTED	CO	HAVING	ONE	THEORETICAL
AFFECTING	COME	HE	ONLY	THERE
AFFORDING	COMING	HIGH	ONTO	THEREFROM
AFTER	COMPANY	HIGHER	OR	THEREON
AGAIN	COMPANIES	HIGHLY	OTHER	THESE
AGAINST	COMPLETE	HIS	OUR	THEY
AIMED	COMPLETED	HOW	OUT	THIRD
ALL	COMPLETELY	I	OVER	THIS
ALLEGED	COMPRISING	IBM	P	THOUGHTS
ALLOW	CONCERNED	IF	PARTICULAR	THOSE
ALLOWS	CONCERNING	II	PER	THREE
ALLOWED	CONSIDERED	III	POOR	THROUGH
ALLOWING	CONSIDERING	IMPLICATIONS	POSSIBLE	THRU
ALMOST	CONSIDERATION	IMPORTANCE	POSSIBILITY	TO
ALONE	CONSIDERATIONS	IMPORTANT	PRACTICAL	TOGETHER
ALONG	CONSISTING	IMPROVED	PRELIMINARY	TOTAL
ALSO	CONVENIENT	IMPROVING	PRESENCE	TOTALLY
AMONG	CORP	IMPROVEMENT	PRESENT	TOWARD
AN	CORPORATION	IMPROVEMENTS	PRIMARY	TOWARDS
ANALYSIS	COULD	IN	PRINCIPLE	TRI
ANALYSES	CPS	INC	PRINCIPLES	TWO
ANALYZING	D	INCLUDE	PROCEDURE	U
AND	DATA	INCLUDED	PROCEDURES	UNDER
AND/OR	DE	INCLUDING	PROGRAM	UNTIL
ANOTHER	DEG	INCREASE	PROGRAMS	UP
ANY	DEPARTMENT	INCREASED	PROGRAMMING	UPON
APART	DEPARTMENTS	INCREASES	PUT	USAGE
APPARENT	DEPENDING	INCREASING	Q	USE
APPARENTLY	DEPT	INCORPORATING	R	USER
APPEAR	DETERMINATION	INFLUENCE	RECENT	USERS
APPEARING	DETERMINE	INFLUENCED	REGARDING	USED
APPLICABILITY	DETERMINED	INFLUENCING	RELATED	USING
APPLICABLE	DETERMINING	INNER	RELATING	USEFUL
APPLICATION	DI	INSIDE	RELATIONSHIP	USEFULNESS
APPLICATIONS	DID	INSTEAD	RELATIONSHIPS	USES
APPLIED	DISCUSSION	INTERESTING	RELATIONSHIPS	UTILIZE
APPLY	DO	INTO	RELATIVE	UTILIZING
APPLYING	DOES	INVOLVING	REQUIRE	UTILIZATION
APPROACH	DOING	IS	REQUIRED	V
APPROACHES	DONE	IT	REQUIRING	VARYING
APPROACHING	DOUBLE	ITS	REQUIRES	VARIOUS
APPRECIABLE	DOUBLY	ITSELF	RESULTING	VERSUS
ARE	DOWN	IV	RESULTS	VERY
ARISE	DR	J	S	VI
ARISING	DUE	K	SCHEME	VIA
AROUND	DURING	KEPT	SCHEMES	VII
AS	E	L	SFC	VIII
ASCERTAIN	EACH	LARGE	SECONDARY	VS
ASPECT	EARLY	LARGER	SEE	W
ASPECTS	EARLIER	LIKE	SEEN	WAS
AT	EASE	LIKELY	SEEMS	WHAT
ATTAIN	EASY	LONG	SELF	WHEN
ATTAINED	EASILY	LOOK	SEVEN	WHERE
ATTEMPT	EIGHT	LOW	SEVENTH	WHEREBY
ATTEMPTED	EITHER	LOWER	SEVERAL	WHICH
ATTEMPTS	ENG	LTD	SHORT	WHILE
AVAILABLE	ET	M	SHORTER	WHO
AVAILABILITY	ETC	MADE	SIGNIFICANT	WHOSE
AVOIDING	EXPLANATION	MAKE	SIGNIFICANCE	WHY
AWAY	EXTREMELY	MAKING	SIMILAR	WILL
B	F	MAKES	SIMPLE	WITH
BAD	FAR	MANY	SIMPLER	WITHIN
BASED	FAST	MEANS	SIMPLY	WITHOUT
BASIC	FEW	MET	SINCE	WOULD
BE	FEWER	METHOD	SINGLE	X
BECAUSE	FIFTH	METHODS	SIX	XI
BEEN	FINAL	MORE	SIXTH	XII
BEFORE	FIRST	MOST	SLOW	XIII
BEING	FIVE	MPH	SLOWLY	Y
BELONG	FOR	MULTIPLE	SMALL	YET
BELOW	FOUR	MY	SMALLER	YOUR
BEST	FOURTH	N	SMALLEST	Z
BETTER	FOURTEEN	NEAR	SO	2K
BETWEEN	FROM	NEARLY	SOME	4K
BEYOND	FT	NECESSARY	SPECIAL	8K
BIG	FULL	NEED	SUCH	10K
BOTH	FULLY	NEEDED	SUGGESTED	12K
BRIEF	FURTHER	NEEDS	SUGGESTIONS	14K
BRIEFLY	FUNDAMENTALS	NEW	SUITABLE	16K
BRING	G	NEWER	SUMMARY	



# Keyword-in-Context (KWIC) Index

TITLE	SYSTEM FILE NO.	PAGE	TITLE	SYSTEM FILE NO.	PAGE
#ABBREVIATED PRINT I TRACING ROUTINE	0705 04.2.002	021	PRECISION FLOATING DIVIDE SUBROUTINE	#DOUBLE 7070 08.4.004	030
CONTROL FIELDS INTO ACTUAL DISK	#CONVERSION OF DATA 1410 02.4.001	023	CT XX, MULTIPLY XX, DIVIDE XX.	#MACRO ADD XX, SUBTRA 1410 03.9.001	024
#ADAPT 1401 COMPILER	7070 08.4.003	030	THE 7340 HYPERTAPE DRIVES	#UTILITY PROGRAMS FOR 7080 UT-144	017
PRECISION FLOATING ADD	#DOUBLE 7070 08.4.003	030	KPOINT 7074-7070	#DUMPI SORT 90 PHASE-ONE RESTART AND CHEC 7070 03.9.003	028
PRECISION FLOATING ADD SUBROUTINE	#DOUBLE 7070 08.4.007	030	#TAPE PRINT, DUPLICATE, SELECT AND MATCHING	7070 11.5.003	035
XX. #MACRO ADD XX, SUBTRACT XX, MULTIPLY XX, DIVIDE	1410 03.9.001	024	#EIGENVALUE AND EIGENVECTOR ROUTINE	1410 03.4.002	023
/7340 CAPABILITIES ADDED/, FOR #FORTRAN LOADER-PACKAGE	7070 FO-149	009	TINE /IBM 7074	#EIGENVALUE AND EIGENVECTOR SOLVER SUBROU 7070 10.2.002	033
# ADDRESSES V 1301	1410 02.4.001	023	#EIGENVALUE AND EIGENVECTOR ROUTINE	7070 10.2.001	033
#EVALUATION OF ADDRESSING TECHNIQUES	1410 03.2.004	023	#EIGENVALUE AND EIGENVECTOR SOLVER SUBROUTINE /IBM 7074	7070 10.2.002	033
WRITE #INVALID ALPHA SEARCH PROGRAM FOR TAPE CHECKPOINT	7070 03.9.001	001	#SUBROUTINE EN FOR IBM 7070	7070 08.2.003	030
#PARTS 80	0705 AT-057	001	#ENGINEERING BLOCK DIAGRAM PROGRAM	1410 EE-01X	003
#ARCTANGENT SUBROUTINE	7070 08.1.010	030	UTION OF NON-LINEAR EQUATION IN ONE VARIABLE /ROOT/	#SOL 7070 09.9.002	031
MERICAL INTEGRATION AREA /F/	#NU 7070 09.5.002	031	TOES- TAPE ORIENTED EQUATION SOLVER	# 1410 10.1.001	025
ODER DECISION TABLE ASSEMBLER	#AUTOC 7070 01.1.002	026	OMPLEX SIMULTANEOUS EQUATION SOLVER /IBM 7074 FORTRAN/	#C 7070 10.4.005	033
#SYMBOLIC ASSEMBLY FOR 1401	0705 01.1.002	021	74 #SIMULTANEOUS EQUATION SOLVER SUBROUTINE SIMEQ /IBM 70	7070 10.4.006	033
ROGRAM #AUTO-CORRELATION AND CROSS-CORRELATION P	7070 11.2.002	034	SIMULTANEOUS LINEAR EQUATIONS #SOLUTION OF	7070 10.4.001	033
#AUTO-COVARIANCE, POWER SPECTRUM	7070 11.2.009	034	# EQUATIONS	7070 09.3.001	031
#AUTO-TEST GENERATOR	7070 04.3.003	028	ION OF SIMULTANEOUS EQUATIONS #MATRIX INVERSION AND SOLUT	7070 10.1.005	031
#7070/7074 AUTOCHART	7070 AD-151	008	#DIFFERENTIAL EQUATIONS /DFEQN/	7070 09.3.003	031
# COMPILER SYSTEMS AUTOCODER	7070 03.9.002	028	YSTEM OF NON-LINEAR EQUATIONS /GFPA, MBLA/ #SOLUTION OF S	7070 10.9.001	034
#BASIC AUTOCODER	7070 AU-072	008	#DIFFERENTIAL EQUATIONS /IRK/	7070 09.3.004	031
#AUTOCODER DECISION TABLE ASSEMBLER	7070 01.1.002	026	VERSION AND LINEAR EQUATIONS /MILE/ #MATRIX I	7070 10.1.013	032
#AUTOCODER MACROS	1410 01.9.001	029	SIMULTANEOUS LINEAR EQUATIONS AND/OR MATRIX #SOLUTION OF	7070 10.1.015	033
AT -- PROCEDURE FOR AUTOMATIC TESTING	#P 7070 AT-082	008	LINEAR SIMULTANEOUS EQUATIONS BY #SOLUTION OF SYSTEMS OF	7070 10.4.007	034
THODS AND STANDARDS AUTOMATION	#M.A.S.A. ME 7080 07.9.001	037	SIMULTANEOUS LINEAR EQUATIONS WITH PIVOTING #SLEP, SOLVE	7070 10.4.004	033
10/7010 RELOCATABLE AUTOPATCH	#14 1410 01.4.002	022	#EVALUATION OF ADDRESSING TECHNIQUES	1410 03.2.004	023
#PRINCIPLE AXIS FACTOR ANALYSIS	7070 11.3.005	034	ING A PROGRAM WHICH EXCEEDS 1410	#CHAIN-SPLITTING AND TAP 1410 03.9.003	024
#BANK 4 UTILITIES	7080 UT-135	017	#FOUR LINE EXECUTE COREDUMP	1410 03.9.005	024
#BINARY SEARCH MACRO	7070 02.5.001	027	#1410/1301 EXECUTIVE	1410 03.2.003	023
#ENGINEERING BLOCK DIAGRAM PROGRAM	1410 EE-01X	003	#TENEZ-TAPE GENERATOR	7070 03.2.004	027
SELF-CHECKING DIGIT CALCULATOR	#MODULUS 11 7070 02.9.001	027	#PEST - PITT EXECUTIVE SYSTEM FOR TAPES	7070 13.2.001	036
# CORE STORAGE CAPACITY	1410 03.9.003	024	#CONSOLE EXERCISE	1410 03.9.006	024
MATRIX -CORR2 - FOR CARD INPUT	#INTERCORRELATION 7070 11.3.004	034	#1410/7010 EXITS	7070 09.1.004	031
#CHANGE CARD LOAD	0705 03.1.001	021	#POLYNOMIAL EXPANSION	7070 09.1.001	030
PROGRAMMING SYSTEM CARD/ TAPE, 1 NON-OVERLAP	#BASIC LINEAR 1410 CO-09X	003	070 POLYNOMIAL ROOT EXTRACTION /TIREX/	#P 7070 09.1.001	030
PROGRAMMING SYSTEM CARD/ TAPE, 1 OVERLAP	#BASIC LINEAR 1410 CO-01X	002	GRAM FOR SELECTION, EXTRACTION AND COUNT	7070 03.9.004	024
PROGRAMMING SYSTEM CARD/ TAPE, 2 OVERLAP	#BASIC LINEAR 1410 CO-07X	003	RINGULAR CORRELATION ANALYSIS	#P 7070 11.3.005	034
ULATION USING MONTE CARLO TECHNIQUES #WAREHOUSE CONTROL SIM	7070 12.9.002	036	#PRINCIPLE AXIS FACTOR ANALYSIS	7070 11.3.005	034
CHI SQUARE /5 DIGIT CELLS/	# 1410 11.2.001	025	A GENERAL STRUCTURE FACTOR PROGRAM FOR CRYSTALLOGRAPHY	# 7070 07.5.001	029
ILY CYCLE AND #62 CFO /CONSOLIDATED FUNCTIONS ORDINARY/ DA	1410 11.06X	004	#NORMALIZED VARIMAX FACTOR ROTATION	7070 11.3.008	035
CH EXCEEDS 1410	#CHAIN-SPLITTING AND TAPING A PROGRAM WHI 1410 03.9.003	024	#ORTHOGONAL FACTOR SIMILARITY PROGRAM	7070 10.1.012	032
#CHANGE CARD LOAD	0705 03.1.001	021	ION OF DATA CONTROL FIELDS INTO ACTUAL DISK	#CONVERS 1410 02.4.001	023
#1410/1401 MODE CHANGE MONITOR	1410 03.1.001	023	1410/7010 TFG- TAPE FILE GENERATOR FOR TESTING	# 7070 MI-084	010
# CHANNEL	1410 CO-01X	003	#TAPE FILE SEARCH AND PRINT FOR THE IBM 7070/7	7070 03.9.004	028
# CHANNEL	1410 CO-09X	002	#TAPE FILE SEARCH ON THE IBM 7070-7074	7070 03.4.005	028
# CHANNELS	1410 CO-07X	002	#SORT /SORT FILE/ MACRO FOR 7080 PROCESSOR	7080 02.1.006	036
CH PROGRAM FOR TAPE CHECKPOINT WRITE	#INVALID ALPHA SEAR 7070 03.9.001	028	#1410/7010 FLIP	1410 03.9.007	024
ASE-ONE RESTART AND CHECKPOINT 7074-7070	#DUMPI SORT 90 PH 7070 03.9.003	028	SITION SUBROUTINE FLIP /IBM 7074 FORTRAN/ #MATRIX TRANSPO	7070 10.1.008	032
#CHI SQUARE /5 DIGIT CELLS/	1410 11.2.001	025	#DOUBLE PRECISION FLOATING ADD	7070 08.4.003	030
#CLASS SCHEDULING PROGRAM FOR THE 7070/74	7070 12.9.004	036	#DOUBLE PRECISION FLOATING ADD SUBROUTINE	7070 08.4.001	030
#CMP- TAPE COMPARE PROGRAM	7080 PR-117X	009	#DOUBLE PRECISION FLOATING DIVIDE	7070 08.4.001	030
#LINEAR PROGRAMMING CODE S2	7070 06.1.004	029	#DOUBLE PRECISION FLOATING DIVIDE SUBROUTINE	7070 08.4.004	030
#COMMUNICATIONS CONTROL PACKAGE	7740 SV-160	018	#DOUBLE PRECISION FLOATING MULTIPLY	7070 08.4.002	030
#1410/7010 COMPARE	1410 03.4.005	024	#DOUBLE PRECISION FLOATING MULTIPLY SUBROUTINE	7070 08.4.005	030
#CMP700-TAPE COMPARE PROGRAM	7080 03.4.009	036	#DOUBLE PRECISION FLOATING SUBTRACT SUBROUTINE	7070 08.4.006	030
#ADAPT 1401 COMPILER	0705 01.2.002	021	# SELECTRIC LOAD FLOW FOR IBM 1410 SYSTEM	7070 12.9.001	024
# COMPILER SYSTEMS AUTOCODER	7070 03.9.002	028	# FOR MACHINES W/O FLT POINT HARDWARE	7070 07.0.004	033
#7070/274 COMPILER SYSTEMS TAPE	7070 PR-117X	011	#BASIC FORTRAN	7070 FO-073	009
#COMPILING SYSTEM TAPE	7080 PR-132	014	SIMULATOR 7070 FULL FORTRAN	#THE INVENTORY MANAGEMENT 7070 12.1.001	036
BM 7074 FORTRAN/	#COMPLEX DETERMINANT SOLVER SUBROUTINE /I 7070 10.3.002	033	NNER FOR 7070/72/74 FORTRAN	#SCANDAL - A SYNTACTICAL SCA 7070 04.9.003	028
7074 FORTRAN/	#COMPLEX MATRIX INVERSION SUBROUTINE /IBM 7070 10.1.009	032	#FORTRAN LIBRARY FOR 7070/72/74	7070 FO-125	009
M 7074 FORTRAN/	#COMPLEX SIMULTANEOUS EQUATION SOLVER /IB 7070 10.4.005	033	#FORTRAN LOADER FOR THE 7070/72/74	7070 FO-116	009
#PRINCIPAL COMPONENTS FACTOR ANALYSIS	7070 10.1.015	033	S ADDED/, FOR #FORTRAN LOADER-PACKAGE /7340 CAPABILITY	7070 FO-149	009
GRAM ANALYSIS /ZPA/ COMPUTER SYSTEM	#ZEUS PRO 7070 01.9.004	026	#FORTRAN SUBROUTINE LIBRARY	1410 FO-138	003
#CONSOL DEMONSTRATION PROGRAM	1410 13.2.001	025	UBROUTINE /IBM 7074 FORTRAN/	#MATRIX INVERSION S 7070 10.1.010	032
#CORE EXERCISE	7070 03.9.001	036	# FORTRAN/	7070 10.2.002	033
#CONVERSION OF DATA CONTROL FIELDS INTO ACTUAL DISK	1410 02.4.001	023	# FORTRAN/	7070 10.4.006	033
#DATA CONTROL PACKAGE	7750 SV-139	018	UBROUTINE /IBM 7074 FORTRAN/	#DETERMINANT SOLVER S 7070 10.3.001	033
#COMMUNICATIONS CONTROL PACKAGE	7740 SV-160	018	UBROUTINE /IBM 7074 FORTRAN/	#MATRIX MULTIPLICATION S 7070 10.1.011	032
#SYSTEMS CONTROL PROGRAM	1410 01.3.001	022	ON SOLVER /IBM 7074 FORTRAN/	#COMPLEX MATRIX INVERSION S 7070 10.1.009	033
HNQUES #WAREHOUSE CONTROL SIMULATION USING MONTE CARLO TEC	7070 12.1.002	036	ON SOLVER /IBM 7074 FORTRAN/	#COMPLEX SIMULTANEOUS EQUATI 7070 10.4.005	033
#PERT MANAGEMENT CONTROL SYSTEM	7070 06.1.003	029	UBROUTINE /IBM 7074 FORTRAN/	#COMPLEX DETERMINANT SOLVER S 7070 10.3.002	033
#SUPERVISOR CONTROL SYSTEM SCS80	7070 03.9.001	036	UBPROGRAM /IBM 7074 FORTRAN/	#GAUSS NUMERICAL INTEGRATION S 7070 09.5.001	031
# CONTROL SYSTEM-IOMRSC	7080 IO-120	014	NE - FLIP /IBM 7074 FORTRAN/	#MATRIX TRANSPOSITION SUBROUTI 7070 10.1.008	032
0 UNDER SUPERVISORY CONTROL SBOUSC	#SORT 80 FOR 708 7080 SM-114	015	SIGNAL DIFFERENTIAL FOURIER SYNTHESIS PROGRAM	#THREE DIMEN 7070 07.5.003	029
CTUAL DISK #CONVERSION OF DATA CONTROL FIELDS INTO A	1410 02.4.001	023	#7070/72 GAMMA FUNCTION SUBROUTINE	7070 09.2.002	031
10 OPERATING SYSTEM #CONVERSION PROGRAM	#1410/70 1410 SE-01X	007	2 CFO /CONSOLIDATED FUNCTIONS ORDINARY/ DAILY CYCLE AND #6	7070 11.06X	004
#1410/7010 COPY- OPERATING SYSTEM PROGRAM	1410 03.4.003	024	#7070/72 GAMMA FUNCTION SUBROUTINE	7070 09.2.002	031
#CORE STORAGE CAPACITY	1410 03.9.003	024	IBM 7074 FORTRAN/	#GAUSS NUMERICAL INTEGRATION SUBPROGRAM / 1410 SM-137	007
#FOUR LINE EXECUTE	7070 03.9.001	036	O1 DISK STORAGE	#GENERALIZED SORTING PROGRAM USING IBM 13 7080 SM-143	016
HE #MULTIPLE CORRELATION AND REGRESSION ANALYSIS BY T	7070 11.3.007	034	#SERIES GENERALIZED SORTING/MERGING PROGRAM	7080 SM-148	013
CORRELATION MATRIX, CORR1	#INTER 7070 11.3.003	034	OOP/ #AUTO-TEST GENERATOR	#GENERATION OF 1401 OPTIMIZED PROGRAMS /G 7070 01.9.003	026
NIS TECH/ WITH ZERO COSTS	#TRANSPORTATION PROBLEM /DEN 7070 12.9.003	036	R /TYPEWRITE/ MACRO GENERATOR FOR THE IBM 7070 SERIES	#TYPW /TYPEWRITE/ MACR 7070 03.9.002	028
ION, EXTRACTION AND COUNT	#PROGRAM FOR SELECT 1410 03.9.004	024	#RANDOM NUMBER GENERATOR SUBROUTINE	7070 11.7.002	035
SCHEDULING	#CRITICAL PATH - MANPOWER AND RESOURCES S 1410 14.9.001	026	#GET PUT DISK SUBROUTINE	1410 03.5.001	024
UTO-CORRELATION AND CROSS-CORRELATION PROGRAM	#A 7070 11.2.002	034	INES W/O FLT. POINT HARDWARE	# FOR MACH 7070 10.4.004	033
FACTOR PROGRAM FOR CRYSTALLOGRAPHY	#A GENERAL STRUCTURE 7070 07.5.001	029	ROGRAMS FOR THE 7340 HYPERTAPE DRIVES	#UTILITY PR 7070 03.9.003	028
# FOR CRYSTALLOGRAPHY	7070 07.5.003	029	CING 1050 AND #IBM SCIENTIFIC TERMINAL SYSTEM FOR SERVI	7740 CX-09X	017
#OHIO UNIVERSAL CULVERT DESIGN	7070 07.2.001	029	CING 1050 AND #IBM SCIENTIFIC TERMINAL SYSTEM FOR SERVI	7740 CX-10X	017
SQUARES POLYNOMIAL CURVE-FITTING ROUTINE	#LEAST 0705 11.1.001	022	RTING PROGRAM USING IBM 1301 DISK STORAGE	#GENERALIZED SO 1410 SM-137	007
ONS ORDINARY/ DAILY CYCLE AND #62 CFO /CONSOLIDATED FUNCTI	1410 11.06X	004	CTRIC LOAD FLOW FOR IBM 1410 SYSTEM	#ELE 1410 12.9.001	025
FUNCTIONS ORDINARY/ DAILY CYCLE AND #62 CFO /CONSOLIDATED	1410 11.06X	004	#SUBROUTINE EN FOR IBM 7070	7070 08.2.003	030
#AUTOCODER DECISION TABLE ASSEMBLER	7070 01.1.002	026	O GENERATOR FOR THE IBM 7070 SERIES	#TYPW /TYPEWRITE/ MACR 7070 03.9.002	028
#CONSOL DEMONSTRATION PROGRAM	1410 13.2.001	025	FILE SEARCH ON THE IBM 7070/72/74	#TAPE 7070 03.4.003	028
#STEEPEST DESCENT SERIES /SDXX, SDOX, SDE/	7070 09.2.001	031	H AND PRINT FOR THE IBM 7070/72/74	#SEAP- FILE SEARC 7070 03.9.004	028
O UNIVERSAL CULVERT DESIGN	7070 07.2.001	029	K UP MACRO FOR THE IBM 7074	#7070/7074 TABLE LO 7070 02.5.002	027
FORTRAN/ #COMPLEX DETERMINANT SOLVER SUBROUTINE /IBM 7074	7070 10.3.002	033	#INDEX MACRO	7070 01.9.008	027
FORTRAN/ #DETERMINANT SOLVER SUBROUTINE /IBM 7074	7070 10.3.001	033	#INDIVIDUAL UTILITY PROGRAM	1410 UT-106	007
#ENGINEERING BLOCK DIAGRAM PROGRAM	1410 EE-01X	003	X -CORR2 - FOR CARD INPUT	#INTERCORRELATION MATRI 7070 11.3.004	034
SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS-KUTTA-GILL NUMERICAL S	7070 10.4.007	034	#HQ USAF TAPE INPUT-OUTPUT PACKAGE	0705 01.3.001	021
#DIFFERENTIAL EQUATIONS /IRK/	7070 09.3.004	031	#INSTANT PROGRAM-LOADING	1410 03.1.002	027
#DIFFERENTIAL EQUATIONS /DFEQN/	7070 09.3.003	031	#SORT/MERGE 12, INSURANCE SORT MODIFICATION	1410 09.0.001	022
#THREE DIMENSIONAL DIFFERENTIAL FOURIER SYNTHESIS PROGRAM	7070 07.5.003	029	#NUMERICAL INTEGRATION AREA /F/	7070 09.5.002	031
US 11 SELF-CHECKING DIGIT CALCULATOR	#MODUL 7070 02.9.001	027	/ #GAUSS NUMERICAL INTEGRATION SUBPROGRAM /IBM 7074 FORTRAN	7070 09.5.001	031
#CHI SQUARE /5 DIGIT CELLS/	1410 11.2.001	025	D INPUT	#INTERCORRELATION MATRIX, CORR1 7070 11.3.003	034
IS PROGRAM #THREE DIMENSIONAL DIFFERENTIAL FOURIER SYNTHESIS	7070 07.5.003	029	#2-ADDRESS INTERPRETIVE SYSTEM	1410 01.4.003	022
OR THE 7070/74-1301 DISK STORAGE #UTILITY PROGRAMS F	7080 UT-129	016	#INTERPRETIVE SYSTEM	1410 01.4.001	022
FIELDS INTO ACTUAL DISK #CONVERSION OF DATA CONTROL FIELDS	1410 02.4.001	023	#INT580	7080 CV-090	014
Y PROGRAMS FOR 2302 DISK STORAGE	#UTILITY 7074 UT-164	014			
GRAM USING IBM 1301 DISK STORAGE	#GENERALIZED SORTING PRO 1410 SM-137	007			
OR THE 1301 OR 2302 DISK STORAGE UNITS	#UTILITY PROGRAMS F 7080 UT-129	016			
#1301 DISK STORAGE UTILITY PROGRAMS	1410 UT-129	016			
#GET PUT DISK SUBROUTINE	1410 03.5.001	024			
PRECISION FLOATING DIVIDE	#DOUBLE 7070 08.4.001	030			

TITLE	SYSTEM	FILE NO.	PAGE	TITLE	SYSTEM	FILE NO.	PAGE			
ECKPOINT WRITE	#INVALID ALPHA SEARCH PROGRAM FOR TAPE CH	7070	03.9.001	028	SOLIDATED FUNCTIONS ORDINARY/ DAILY CYCLE AND	#62 CFO /CON	1410	I106X	004	
FORTRAN	#THE INVENTORY MANAGEMENT SIMULATOR 7070 FULL	7070	12.1.001	036	#TOES-TAPE ORIENTED EQUATION SOLVER		1410	10.1.001	025	
	#PRODUCT INVERSE LINEAR PROGRAMMING	0705	06.1.002	022	AMMING SYSTEM /TAPE ORIENTED/ 1 OVERLAP	#BASIC LINEAR PROGR	1410	CO-06X	002	
	#MATRIX INVERSION	0705	10.1.001	022	#ORTHOGONAL FACTOR SIMILARITY PROGRAM		7070	10.1.012	032	
LE PRECISION MATRIX	INVERSION	7070	10.1.007	032	OW PRICES LISTED IN OUTPUT	# ALLOWED & SHAD	7070	12.9.003	036	
	#MATRIX INVERSION AND LINEAR EQUATIONS /MILE/	7070	10.1.013	032	SYSTEM CARD/ TAPE, 1 OVERLAP	#BASIC LINEAR PROGRAMMING S	1410	CO-01X	002	
QUATIONS	#MATRIX INVERSION AND SOLUTION OF SIMULTANEOUS E	7070	10.1.006	032	SYSTEM CARD/ TAPE, 2 OVERLAP	#BASIC LINEAR PROGRAMMING S	1410	CO-07X	002	
	#MATRIX INVERSION IN DOUBLE PRECISION /SUB/	7070	10.1.006	032	M /TAPE ORIENTED/ 1 OVERLAP	#BASIC LINEAR PROGRAMMING SYSTE	1410	CO-06X	002	
	#MATRIX INVERSION SUBROUTINE /IBM 7074 FORTRAN/	7070	10.1.010	032	MUNICATIONS CONTROL PACKAGE	#COM	7740	SV-160	018	
	#COMPLEX MATRIX INVERSION SUBROUTINE /IBM 7074 FORTRAN/	7070	10.1.009	032	#DATA CONTROL PACKAGE		7750	SV-139	018	
	#III	0705	10-047	001	R TAPE INPUT-OUTPUT PACKAGE	#HQ USA	0705	01.3.001	021	
	#ITEM ANALYSIS PROGRAM II	7070	11.9.003	035	RY UPDATING ROUTINE PACKAGE	#LURE -- LIBRA	7070	02.9.002	027	
	#ITEM ANALYSIS PROGRAM	7070	11.9.002	035	#PAT -- PROCEDURE FOR AUTOMATIC TESTING		7070	AT-082	008	
	#LABEL AND SERIALLY NUMBER TAPES	7070	03.4.001	031	#CRITICAL PATH -- MANPOWER AND RESOURCES SCHEDULING		1410	14.9.001	026	
	#DOUBLE PRECISION LEAST SQUARES	7070	09.9.001	031	ESSION /PEXX, PEXN, PEDE/	#NON-LINEAR REGR	7070	11.3.011	035	
	#LEAST SQUARES POLYNOMIAL CURVE-FITTING R	0705	11.1.001	022	#1410/1301 PERT III PROGRAM-TIME MODULE		1410	14.3.001	025	
ROUTINE	LIBRARY	1410	FO-138	003	#PERT MANAGEMENT CONTROL SYSTEM		7070	06.1.003	029	
FORTRAN SUBROUTINE	LIBRARY FOR 7070/72/74	7070	FO-125	009	#PEST - PITT EXECUTIVE SYSTEM FOR TAPES		7070	03.2.004	027	
	#LURE -- LIBRARY UPDATING ROUTINE PACKAGE	7070	02.9.002	027	R REGRESSION /PEXX, PEXN, PEDE/	#NON-LINEA	7070	11.3.011	035	
	#FOUR LINE EXECUTE COREDPUM	1410	03.9.005	024	70 #DUMPI SORT 90 PHASE-ONE RESTART AND CHECKPOINT 7074-70		7070	03.9.003	028	
ION OF SIMULTANEOUS	LINEAR EQUATIONS	#SOLUT	7070	10.4.001	033	#PILOT PROGRAM TAPE SYSTEM		7070	03.2.005	028
ATRIX INVERSION AND	LINEAR EQUATIONS /MILE/	#M	1410	03.4.001	024	#PILOT TAPE PRINT PROGRAM		7070	02.9.002	028
ION OF SIMULTANEOUS	LINEAR EQUATIONS AND/OR MATRIX	#SOLUT	7070	10.1.006	032	#PEST - PITT EXECUTIVE SYSTEM FOR TAPES		7070	03.2.004	027
SOLVE SIMULTANEOUS	LINEAR EQUATIONS WITH PIVOTIOG	#SLEP,	7070	10.4.004	033	NEAR EQUATIONS WITH PIVOTIOG	#SLEP, SOLVE SIMULTANEOUS LI	7070	10.4.004	033
#PRODUCT INVERSE	LINEAR PROGRAMMING	0705	06.1.002	022	#DATA PLOTTER		7070	07.9.001	029	
	#LINEAR PROGRAMMING	0705	06.1.001	021	R MACHINES W/O FLT. POINT HARDWARE	# FO	7070	10.4.004	033	
	#LINEAR PROGRAMMING CODE S2	7070	06.1.004	029	#LEAST SQUARES POLYNOMIAL CURVE-FITTING ROUTINE		0705	11.1.001	022	
OVERLAP	#BASIC LINEAR PROGRAMMING SYSTEM CARD/ TAPE, 1	1410	CO-01X	002	#POLYNOMIAL EXPANSION		7070	10.1.004	031	
/ 1 OVERLAP	#BASIC LINEAR PROGRAMMING SYSTEM /TAPE ORIENTED	1410	CO-01X	002	#7070 POLYNOMIAL ROOT EXTRACTION /TIREX/		7070	10.1.002	036	
	#1410/7010 LINEAR PROGRAMMING SYSTEM	1410	CO-10X	003	#POLYNOMIAL ROOT SUBROUTINE		7070	08.3.011	030	
OVERLAP	#BASIC LINEAR PROGRAMMING SYSTEM CARD/ TAPE, 2	1410	CO-07X	002	#PORTFOLIO SELECTION PROGRAM		7074	FI-02X	013	
NON-OVERLAP	#BASIC LINEAR PROGRAMMING SYSTEM CARD/ TAPE, 1	1410	CO-09X	003	#AUTO-COVARIANCE, POWER SPECTRUM		7070	11.2.001	034	
#STEPWISE MULTIPLE	LINEAR REGRESSION ANALYSIS	1410	11.3.001	025	INVERSION IN DOUBLE PRECISION /SUB/	#	7070	11.0.1.006	032	
SOLUTION OF SYSTEMS OF	LINEAR SIMULTANEOUS EQUATIONS BY	#SOL	7070	10.4.007	034	#DOUBLE PRECISION FLOATING ADD		7070	08.4.003	030
	#LIST 75	0705	MI-058	001	#DOUBLE PRECISION FLOATING ADD SUBROUTINE		7070	08.4.007	030	
	#CHANGE CARD LOAD	0705	03.1.001	021	#DOUBLE PRECISION FLOATING DIVIDE SUBROUTINE		7070	08.4.001	030	
WED & SHADOW PRICES	LISTED IN OUTPUT	# ALLO	7070	12.9.003	036	#DOUBLE PRECISION FLOATING DIVIDE		7070	08.4.001	030
	#ELECTRIC LOAD FLOW FOR IBM 1410 SYSTEM	1410	12.9.001	025	#DOUBLE PRECISION FLOATING MULTIPLY SUBROUTINE		7070	08.4.005	030	
	#UPLD - UPOS	1410	03.1.002	023	#DOUBLE PRECISION FLOATING MULTIPLY		7070	08.4.002	030	
	#FORTRAN LOADER FOR THE 7070/72/74	7070	FO-116	009	#DOUBLE PRECISION FLOATING SUBTRACT SUBROUTINE		7070	08.4.006	030	
, FOR	#FORTRAN LOADER-PACKAGE /7340 CAPABILITIES ADDED/	7070	FO-149	009	#DOUBLE PRECISION LEAST SQUARES		7070	09.9.001	031	
	#TABLE LOOKUP SUBROUTINE	1410	03.4.001	031	#DOUBLE PRECISION MATRIX INVERSION		7070	10.1.007	032	
	#LOOP MACRO	7070	01.9.007	026	#ALLOWED & SHAD	#	7070	10.1.007	032	
	#LURE -- LIBRARY UPDATING ROUTINE PACKAGE	7070	02.9.002	027	#PRINCIPAL COMPONENTS FACTOR ANALYSIS		7070	10.1.015	033	
	# FOR MACHINES W/O FLT. POINT HARDWARE	7070	10.4.004	033	AP- FILE SEARCH AND PRINT FOR THE IBM 7070/72/74	#SE	7070	03.9.004	028	
	#BINARY SEARCH MACRO	7070	02.5.001	027	#ABBREVIATED PRINT I TRACING ROUTINE		0705	04.2.002	021	
	#INDEX MACRO	7070	01.9.008	027	#PRINT I TRACING ROUTINE		0705	04.2.001	021	
	#LOOP MACRO	7070	01.9.007	026	#PILOT TAPE PRINT PROGRAM		7070	03.4.004	028	
DIVIDE XX.	#MACRO ADD XX, SUBTRACT XX, MULTIPLY XX,	7070	01.9.007	026	#TAPE PRINT, DUPLICATE, SELECT AND MATCHING		1410	03.4.002	023	
	#SQUARE ROOT MACRO AND SUBROUTINE	7070	08.3.001	037	#TRANSPORTATION /DENNIS TECH/ WITH ZERO COSTS		7070	12.9.003	036	
/7074 TABLE LOOK UP	MACRO FOR THE IBM 7074	#7070	02.5.002	027	#TRANSPORTATION PROBLEM /DENNIS TECHNIQUE/		7070	12.9.001	036	
#SORT/ SORT FILE/	MACRO FOR 7080 PROCESSOR	7080	02.1.006	036	ILE/ MACRO FOR 7080 PROCESSOR	#SORT/ SORT F	7080	02.1.006	036	
#TYPWR /TYPEWRITE/	MACRO GENERATOR FOR THE IBM 7070 SERIES	7070	03.9.002	028	#1410/1301 /DISK/	PROCESSOR OPERATING SYSTEM TAPE	1410	PR-130	005	
#AUTOCODER	MACROS	1410	01.9.001	022	#PROCESSOR OPERATING SYSTEM TAPE		1410	PR-134	005	
	#PERT MANAGEMENT CONTROL SYSTEM	7070	06.1.003	029	#PRODUCT INVERSE LINEAR PROGRAMMING		0705	06.1.002	022	
	#THE INVENTORY MANAGEMENT SIMULATOR 7070 FULL FORTRAN	7070	12.1.001	036	#INSTANT PROGRAM LOADING		7070	10.1.001	027	
	#CRITICAL PATH - MANPOWER AND RESOURCES SCHEDULING	1410	14.3.001	025	#1410/1301 PERT III PROGRAM-TIME MODULE		1410	14.3.001	025	
	#PLI, SELECT AND MATCHING	1410	03.4.002	023	#MEMORY PUNCH OUT		0705	03.9.001	021	
	#AR EQUATIONS AND/OR MATRIX	#SOLUTION OF SIMULTANEOUS LINE	7070	10.1.006	032	#RAMAC UTILITIES		7070	UT-080	013
	#INTERCORRELATION MATRIX --CORR2 - FOR CARD INPUT	7070	11.3.004	034	#RANDOM NUMBER GENERATOR SUBROUTINE		7070	11.7.002	035	
	#MATRIX INVERSION	0705	10.1.001	022	#DUNCANS MULTIPLE RANGE TEST PROGRAM		7070	11.5.003	035	
#DOUBLE PRECISION	MATRIX INVERSION	7070	10.1.007	032	#PRECOR		7080	01.9.003	036	
ILE/	#MATRIX INVERSION AND LINEAR EQUATIONS /M	7070	10.1.013	032	#CROUT EQUATION		7070	10.4.001	034	
NEOUS EQUATIONS	#MATRIX INVERSION AND SOLUTION OF SIMULTA	7070	10.1.013	032	#STEPWISE REGRESSION		7070	11.3.001	022	
RTRAN/	#COMPLEX MATRIX INVERSION SUBROUTINE /IBM 7074 FO	7070	10.1.009	032	#NON-LINEAR REGRESSION /PEXX, PEXN, PEDE/		7070	11.3.011	035	
RTRAN/	#MATRIX INVERSION SUBROUTINE /IBM 7074 FO	7070	10.1.010	032	ISE MULTIPLE LINEAR REGRESSION ANALYSIS	#STEPM	1410	11.3.001	025	
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#LIST 75	0705	MI-058	001
#LIST 77	0705	MI-059	001
#APTS 80	0705	AT-057	001
#SORT 80	0705	SM-054	002
#MERGE 80	0705	SM-055	002
OUSC #SORT 80 FOR 7080 UNDER SUPERVISORY CONTROL S8	7080	SM-114	015
#SORT 90	7070	SM-077	012
-7070 #DUMPI SORT 90 PHASE-ONE RESTART AND CHECKPOINT 7074	7070	03.9.003	028
#MERGE 91	7070	SM-078	012

# IBM Programs

## 0705

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CONTINUED FROM PRIOR COLUMN--

0705-AT-057 APTS 80  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-AT-057

PURPOSE AN AUTOMATIC PROGRAM TESTING SYSTEM FOR THE IBM 705 III, CONSISTING OF A COORDINATED SET OF THE /80 SERIES/ UTILITY PROGRAMS THAT ARE USED IN TESTING, MODIFIED SO THAT THE UTILITY PROGRAMS THEMSELVES MAY BE LOADED AUTOMATICALLY FROM A UTILITY TAPE, AND THEIR CONTROL CARDS FROM THE CARD READER OR OTHER INPUT DEVICE INDEPENDENT OF THE UTILITY TAPE. WITH APTS 80, ALL PROGRAMS BEING TESTED MAY BE LOADED FROM A SINGLE TAPE, AND TEST DATA CARDS AND PROGRAM CORRECTION CARDS MAY BE READ FROM THE CARD READER.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.  
CARD DECK - CONDENSED PROGRAM DECK.

0705-CV-045 0705/1401A ASSEMBLY PROGRAM  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-CV-045

PURPOSE TO ASSEMBLE, ON THE 705, PROGRAMS WRITTEN IN 1401 SYMBOLIC LANGUAGE TO PRODUCE AS THE END RESULT OF THE ASSEMBLY A LISTING AND PROGRAM CARDS IN 1401 MACHINE LANGUAGE. MACHINE REQUIREMENTS THE 705-1401A ASSEMBLY PROGRAM WILL RUN ON A MODEL I, II, III, ITCU, TRC, DS. MAGNETIC TAPE DRIVES REQUIRED THREE /3/ IF CARD READER INPUT. THREE /3/ IF TAPE INPUT-SINGLE ASSEMBLY. FOUR /4/ IF TAPE INPUT-MULTIPLE ASSEMBLIES.  
THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.  
CARD DECK - CONDENSED PROGRAM DECK.  
OPTIONAL PROGRAM MATERIAL -  
ONE MAGNETIC TAPE - ASSEMBLY LISTINGS.

0705-IO-047 III IOCS  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-IO-047

PURPOSE IOCS HANDLES READING AND WRITING, CHECKPOINT AND RESTART, ERROR CORRECTION, BEGINNING AND END-OF-REEL AND BEGINNING AND END-OF-FILE PROCESSING, TAPE RECORD BLOCKING AND DE-BLOCKING, AND LABEL CHECKING. MACRO-INSTRUCTIONS AND CONTROL PARAMETERS CODED BY THE PROGRAMMER CAUSE GENERATION OF LINKAGES TO IOCS SUBROUTINES, WHICH IN TURN PERFORM THE SPECIFIED FUNCTIONS. AN INPUT/OUTPUT MEMORY RESTORE SYSTEM /IUMK SB/ OPERATES IN CONJUNCTION WITH IOCS TO RESTORE PROGRAM STATUS FROM PERIODICALLY RECORDED CHECKPOINTS, SO THAT IN THE EVENT OF PROGRAM INTERRUPTION, PREVIOUS PROCESSING NEED NOT BE REPEATED. STORAGE REQUIREMENTS PREASSEMBLED IOCS OCCUPIES 17, 074 LOCATIONS. EQUIPMENT SPECIFICATIONS 705 MODEL III 767 DATA SYNCHRONIZER.  
THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL MUST BE REQUESTED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
CARD DECK - CONDENSED PROGRAM DECK.  
ONE MAGNETIC TAPE - 705 III IOCS SYSTEM TAPE

OPTIONAL PROGRAM MATERIAL -  
ONE MAGNETIC TAPE - ASSEMBLY LISTINGS.

0705-MI-058 LIST 75  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-MI-058

PURPOSE THIS PROGRAM, USING PROGRAM CARDS AS INPUT, PRODUCES A SORTED LISTING OF A PROGRAMS INSTRUCTIONS BY STORAGE LOCATION, STORAGE UNIT, MNEMONIC OPERATION CODE, AND ADDRESS. THIS OUTPUT IS HELPFUL IN ANALYZING A PROGRAM FOR TRANSFER POINTS, MODIFIED INSTRUCTIONS, INSTRUCTIONS THAT SET OR RESET SWITCHES, ETC. EQUIPMENT SPECIFICATIONS 705 MODEL I OR MODEL II 754 TAPE CONTROL.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS... LISTINGS.  
CARD DECK - CONDENSED PROGRAM DECK.

0705-MI-059 LIST 77  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-MI-059

PURPOSE THIS PROGRAM, USING PROGRAM CARDS AS INPUT, PRODUCES A SORTED LISTING OF A PROGRAMS INSTRUCTIONS BY STORAGE LOCATION, STORAGE UNIT, MNEMONIC OPERATION CODE, AND ADDRESS. THIS OUTPUT IS HELPFUL IN ANALYZING A PROGRAM FOR TRANSFER POINTS, MODIFIED INSTRUCTIONS, INSTRUCTIONS THAT SET OR RESET SWITCHES, ETC. EQUIPMENT SPECIFICATIONS 705 MODEL I OR MODEL II 2 777 TRC S

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS... LISTINGS.  
CARD DECK - CONDENSED PROGRAM DECK.

0705-PR-146 PROCESSOR OPERATING SYSTEM  
TAPE  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-PR-146

THE FOLLOWING PROGRAMS ARE CONTAINED ON THIS SYSTEM TAPE.  
7058 COBOL PROCESSOR 0705-PR-131  
7058 PROCESSOR 0705-PR-044  
7058 PROCESSOR LIBRARY

7058 COBOL PROCESSOR  
705-PR-131

THE 7058 COBOL PROCESSOR CONVERTS SOURCE PROGRAM ENTRIES WRITTEN IN THE COBOL LANGUAGE INTO AUTOCODER-ENTRIES FOR ASSEMBLY BY THE 7058 PROCESSOR INTO MACHINE LANGUAGE PROGRAMS FOR THE 705 MODELS I, II AND III, AND THE 7080. IN ADDITION, THE PROCESSOR WILL RECOGNIZE THE COBOL ENTER AUTOCODER STATEMENT IN THE PROCEDURE DIVISION OF A COBOL PROGRAM AND WILL ACCEPT ENTRIES WRITTEN IN AUTOCODER AND THE HIGHER LANGUAGES--FORTRAN, REPORT/FILE, DECISION, ARITHMETIC AND TABLE-CREATING.

MACHINE REQUIREMENTS- THE 7058 COBOL PROCESSOR OPERATES ON A 705 MODEL II, MODEL III OR 7080 WITH A MINIMUM OF EIGHT TAPE UNITS PLUS A CARD READER OR ADDITIONAL TAPE UNIT FOR THE SOURCE PROGRAM. THE AVAILABILITY OF ADDITIONAL TAPE UNITS WILL NORMALLY RESULT IN INCREASED SPEED OF COMPILATION.

7058 PROCESSOR  
705-PR-044

7058 PROCESSOR- THIS IS THE BASIC MODULE OF THE 7058 COMPILING SYSTEM IN THE SENSE THAT IT PROVIDES THE ASSEMBLY FACILITY OF THE COMPILING SYSTEM. THE 7058 PROCESSOR COMPILES PROGRAMS WRITTEN IN THE AUTOCODER II LANGUAGE AND THE HIGHER LANGUAGES, FORTRAN, REPORT-FILE, DECISION ARITHMETIC, AND TABLE-CREATING. PROGRAMS CODED FOR COMPILATION BY THE 7058 PROCESSOR ARE, IN MOST RESPECTS, ALSO SUITABLE FOR COMPILATION WITH THE 7080 PROCESSOR.

7058 PROCESSOR LIBRARY  
705-PR-044

7058 PROCESSOR LIBRARY- AN EXTENSIVE COLLECTION OF MACRO-INSTRUCTIONS AND SUBROUTINES THAT CAN BE ELICITED BY MEANS OF SOURCE PROGRAM STATEMENTS TO PERFORM A LARGE VARIETY OF GENERAL-PURPOSE AND SPECIAL-PURPOSE FUNCTIONS IN AN OBJECT PROGRAM. AMONG THE FUNCTIONS OF GENERAL-PURPOSE MACRO-INSTRUCTIONS ARE ASSEMBLY CONTROL, DATA TRANSMISSION, DATA TESTING, PROGRAM BRANCH CONTROL, AUTOMATIC DECIMAL POINT ARITHMETIC, ADDRESS MODIFICATION AND TABLE MAINTENANCE. THROUGH THE MEDIUM OF THE 7058 PROCESSOR, LIBRARY MATERIAL CAN BE ADDED, DELETED AND REPLACED.

MACHINE REQUIREMENTS- ANY 705 II, 705 III OR 7080 IN 705 II MODE, 40,000 POSITIONS OF MEMORY. EIGHT 729 OR 727 TAPE UNITS WHICH MAY BE ON ANY SERIAL TAPE UNIT CONTROL OR ON FROM ONE TO FOUR CHANNELS.  
THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL PROGRAM MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS... LISTINGS.  
CARD DECK - SAMPLE PROBLEM DECK.  
FOUR MAGNETIC TAPES - OPERATING SYSTEM TAPE /ONE TAPE/... LIBRARY TAPES FOR 705 II, 705 III AND 7080 /THREE TAPES/.

OPTIONAL PROGRAM MATERIAL -  
TWENTY MAGNETIC TAPES - 705-PR-044 ASSEMBLY LISTINGS /TWENTY ONE TAPES/...705-PR-131 ASSEMBLY LISTINGS /THREE TAPES/.  
PRINTED LISTING - FOR 705-PR-044.

0705-SM-048 SORT 54  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-SM-048

PURPOSE SORT 54 IS A GENERALIZED THREE-WAY MERGE SORTING PROGRAM. IT IS CAPABLE OF MODIFYING ITSELF ACCORDING TO CONTROL CARD SPECIFICATIONS. EQUIPMENT SPECIFICATIONS IBM 705 /MODEL I OR MODEL II/ 754 TAPE CONTROL 7 727 TAPE DRIVES 717 PRINTER ADDITIONAL REMARKS SORT 54 INCORPORATES CHECKPOINT, RESTART, AND INTERRUPT SORT PROCEDURES. IT ACCEPTS SINGLE OR BLOCKED FIXED LENGTH RECORDS OR SINGLE VARIABLE LENGTH RECORDS.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP.  
CARD DECK - CONDENSED PROGRAM DECK.

0705-SM-049 SORT 54T  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-SM-049

PURPOSE SORT 54T IS A GENERALIZED THREE-WAY MERGE SORTING PROGRAM. IT IS CAPABLE OF MODIFYING ITSELF ACCORDING TO CONTROL CARD SPECIFICATIONS. EQUIPMENT SPECIFICATIONS IBM 705 /MODEL I OR MODEL II/ 777 TAPE RECORD COORDINATORS 7 727 TAPE DRIVES 717 PRINTER ADDITIONAL REMARKS SORT 54T INCORPORATES CHECKPOINT, RESTART, AND INTERRUPT SORT PROCEDURES. IT ACCEPTS SINGLE OR BLOCKED FIXED LENGTH RECORDS OR SINGLE VARIABLE LENGTH RECORDS.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP.  
CARD DECK - CONDENSED PROGRAM DECK.

0705-SM-050 SORT 57  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-SM-050

PURPOSE SORT 57 IS A GENERALIZED FOUR-WAY MERGE SORTING PROGRAM. IT IS CAPABLE OF MODIFYING ITSELF ACCORDING TO CONTROL CARD SPECIFICATIONS. EQUIPMENT SPECIFICATIONS IBM 705 /MODEL I OR MODEL II/ 2 777 TAPE RECORD COORDINATORS 7 727 TAPE DRIVES 717 PRINTER ADDITIONAL REMARKS SORT 57 INCORPORATES CHECKPOINT, RESTART, AND INTERRUPT SORT PROCEDURES. IT ACCEPTS SINGLE OR BLOCKED FIXED LENGTH RECORDS.

# IBM Programs

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BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP.  
CARD DECK - CONDENSED PROGRAM DECK.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS...  
LISTINGS.  
CARD DECK - CONDENSED PROGRAM DECK.

0705-SM-051 SORT 54/  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-SM-051

OPTIONAL PROGRAM MATERIAL -  
THREE MAGNETIC TAPES - ASSEMBLY LISTINGS.

PURPOSE SORT 54/ IS A GENERALIZED THREE-WAY MERGE SORTING PROGRAM. IT IS CAPABLE OF MODIFYING ITSELF ACCORDING TO CONTROL CARD SPECIFICATIONS. EQUIPMENT SPECIFICATIONS-IBM 705 MODEL III 754 TAPE CONTROL, 727 TAPE DRIVES, 717 PRINTER. SORT 54/ INCORPORATES CHECKPOINT, RESTART, AND INTERRUPT SORT PROCEDURES. IT ACCEPTS SINGLE OR BLOCKED FIXED LENGTH RECORDS OR SINGLE VARIABLE LENGTH RECORDS.

0705-UT-056 UTILITY PROGRAMS /80 SERIES/  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-UT-056

PURPOSE ALL /80 SERIES/ UTILITY PROGRAMS EXCEPT LOAD 80 AND CLRM80 CONTAIN ROUTINES THAT WILL CHECK LABELS SET UP IN CONFORMANCE WITH IBM STANDARDS, IF DESIRED. SINGLE CARD LOAD /LOAD 80/, LOADS STANDARD 705 PROGRAM CARDS FROM CARD READER OR A 729 DS TAPE. CLEAR MEMORY /CLRM80/ SETS MEMORY POSITIONS 00160 - 39999 /OR 79999/ TO BLANKS, AND RESETS THE ACCUMULATOR AND ASUS 01 - 11 WITHOUT INTERRUPTING AUTOMATIC OPERATION. EXPANDED LOADS /LOAD 81 AND LOAD 82/ LOAD STANDARD AND/OR EXPANDED FORMAT PROGRAM CARDS FROM ONE OR A COMBINATION OF TWO INPUT UNITS. BOTH PROGRAMS FEATURE THE ABILITY TO LOCATE A SPECIFIED PROGRAM ON A TAPE. TAPE FILE ASSEMBLER /TPF180/ ASSEMBLES TAPE FILES FROM CARDS OR CARD IMAGES ON TAPE. OUTPUT MAY BE FIXED- OR VARIABLE-LENGTH TAPE RECORDS, SINGLE OR BLOCKED. TAPES MUST BE USED ON 729 TAPE UNITS. MEMORY PRINT /MEPR80/ PRODUCES A PRINTED LISTING OF THE CONTENTS OF ANY TAPE MOUNTED ON 729 TAPE UNIT, EITHER DIRECTLY ON A 717, 720, OR 730 PRINTER OR ON A 729 I TAPE FOR LATER OFF-LINE PRINTING. TAPE DUPLICATION /TPD80\* DUPLICATES ANY 767 DATA SYNCHRONIZER-CONTROLLED TAPE OR TAPES, OR ANY SELECTED FILE OR FILES THEREON. EQUIPMENT SPECIFICATIONS 705 MODEL III, OR 7080

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP.  
CARD DECK - CONDENSED PROGRAM DECK.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.  
CARD DECK - CONDENSED PROGRAM DECK.

0705-SM-052 SORT 54T/  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-SM-052

PURPOSE SORT 54T/ IS A GENERALIZED THREE-WAY MERGE SORTING PROGRAM. IT IS CAPABLE OF MODIFYING ITSELF ACCORDING TO CONTROL CARD SPECIFICATIONS. EQUIPMENT SPECIFICATIONS-IBM 705 MODEL III 777 TAPE RECORD COORDINATOR, 727 TAPE DRIVES, 717 PRINTER. ADDITIONAL REMARKS SORT 54T/ INCORPORATES CHECKPOINT, RESTART, AND INTERRUPT SORT PROCEDURES. IT ACCEPTS SINGLE OR BLOCKED FIXED LENGTH RECORDS OR SINGLE VARIABLE LENGTH RECORDS.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP.  
CARD DECK - CONDENSED PROGRAM DECK.

0705-SM-053 SORT 57/  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-SM-053

PURPOSE SORT 57/ IS A GENERALIZED FOUR-WAY MERGE SORTING PROGRAM. IT IS CAPABLE OF MODIFYING ITSELF ACCORDING TO CONTROL CARD SPECIFICATIONS. EQUIPMENT SPECIFICATIONS-IBM 705 MODEL III, 2-777 TAPE RECORD COORDINATORS 727 TAPE DRIVES, 717 PRINTER. ADDITIONAL REMARKS SORT 57/ INCORPORATES CHECKPOINT, RESTART, AND INTERRUPT SORT PROCEDURES. IT ACCEPTS SINGLE OR BLOCKED FIXED LENGTH RECORDS.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP.  
CARD DECK - CONDENSED PROGRAM DECK.

0705-SM-054 SORT 80  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-SM-054

PURPOSE A GENERALIZED SORTING PROGRAM THAT WILL SORT FILES OF FIXED- OR VARIABLE-LENGTH DATA RECORDS, SINGLE OR BLOCKED, ON A CONTROL DATA WORD AS LONG AS 100 CHARACTERS AND CONSISTING OF AS MANY AS FIVE FIELDS. TO FACILITATE PROGRAM SCHEDULING, SORT 80 WILL USE WHATEVER TAPE UNITS ARE SPECIFIED IN THE CONTROL INFORMATION SUPPLIED BY THE USER. OPTIONAL FEATURES OF SORT 80 INCLUDE AN EXTENDED SORT MADE FOR SORTING PARTICULARLY LARGE FILES, AND PROVISIONS FOR LABEL PROCESSING AND FOR THE ACCUMULATION AND CHECKING OF HASH TOTALS. EXITS ARE PROVIDED AT LOGICAL POINTS IN THE PROGRAM TO ALLOW THE USER TO INCLUDE ADDITIONAL ROUTINES. SORT 80 ALSO PROVIDES CHECKPOINTS, INTERRUPT AND RESTART PROCEDURES, AND ROUTINE WHICH FACILITATE THE CORRECTION, OR DELETION AND LATER RECOVERY OF UNREADABLE RECORDS. EQUIPMENT SPECIFICATIONS 705 MODEL III OR 7080 767 DATA SYNCHRONIZER 4 TAPE DRIVES  
THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.  
CARD DECK - CONDENSED PROGRAM DECK.

OPTIONAL PROGRAM MATERIAL -  
SIX MAGNETIC TAPES - ASSEMBLY LISTINGS.

0705-SM-055 MERGE 80  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 0705-SM-055

PURPOSE A GENERALIZED TWO- TO TEN-WAY MERGING PROGRAM THAT WILL MERGE FILES OF FIXED- OR VARIABLE-LENGTH DATA RECORDS, SINGLE OR BLOCKED, ON A CONTROL DATA WORD AS LONG AS 100 CHARACTERS AND CONSISTING OF AS MANY AS FIVE FIELDS. TO FACILITATE PROGRAM SCHEDULING, MERGE 80 WILL USE WHATEVER TAPE UNITS ARE SPECIFIED IN THE CONTROL INFORMATION SUPPLIED BY THE USER. OPTIONAL FEATURES OF MERGE 80 INCLUDE PROVISIONS FOR LABEL PROCESSING AND FOR THE ACCUMULATION AND CHECKING OF HASH TOTALS. EXITS ARE PROVIDED AT LOGICAL POINTS IN THE PROGRAM TO ALLOW THE USER TO INCLUDE ADDITIONAL ROUTINES. MERGE 80 ALSO PROVIDES CHECKPOINT, INTERRUPT AND RESTART PROCEDURES, AND ROUTINES WHICH FACILITATE THE CORRECTION, OR DELETION AND LATER RECOVERY OF UNREADABLE RECORDS. EQUIPMENT SPECIFICATIONS 705 MODEL III OR 7080, 767 DATA SYNCHRONIZER, 4 TAPE DRIVES.  
THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

## 1410

1410-CO-01X BASIC LINEAR PROGRAMMING  
SYSTEM CARD/ TAPE, 1 OVERLAP CHANNEL  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 1410-CO-01X

TO PROVIDE A BASIC LINEAR PROGRAMMING SYSTEM WITH FLEXIBLE INPUT AND OUTPUT FACILITIES THE CODE INCLUDES AN OPERATING SYSTEM THAT CAN HANDLE MANY USER ADDITIONS AND MODIFICATIONS TO THE BASIC CODE. FEATURES- \*VARIABLE PRECISION FLOATING POINT. \*BASIC DATA ENTERED IN SHARE STANDARD ELEMENT CARD FORMAT. \*ORIGINAL SIMPLEX ALGORITHM WITH SPECIAL FEATURES. \*FOUR ESSENTIAL ZERO OR TOLERANCE CONTROLS. \*FOUR OUTPUT REPORTS AVAILABLE. \*SOURCE LANGUAGE IS IBM 1410 AUTOCODER/IOCS. \*OPERATING SYSTEM WITH LIBRARIAN FACILITIES. TO SOLVE PROBLEMS HAVING UP TO 150 ROWS AND 9999 VARIABLES. REQUIREMENTS FOR 1410-CO-01X- 40,000 POSITIONS OF STORAGE. 4 MAGNETIC TAPE UNITS ON CHANNEL 1. 1 CARD READER ON CHANNEL 1. 1 IBM 1403 MODEL 2 OR MODEL 3 PRINTER, ON CHANNEL 1 OR 1 ADDITIONAL MAGNETIC TAPE UNIT ON CHANNEL 1. OVERLAP AND PRIORITY SPECIAL FEATURES.

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM  
REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS...  
LISTINGS.  
CARD DECK - CONDENSED PROGRAM DECK.  
ONE MAGNETIC TAPE - SYSTEM TAPE.

OPTIONAL PROGRAM MATERIAL -  
TWO MAGNETIC TAPES - CONTAINING LISTINGS, SOURCE AND OBJECT DECKS.

1410-CO-06X BASIC LINEAR PROGRAMMING  
SYSTEM /TAPE ORIENTED/ 1 OVERLAP CHANNEL  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 1410-CO-06X

TO PROVIDE BASIC LINEAR PROGRAMMING SYSTEM WITH FLEXIBLE INPUT AND OUTPUT FACILITIES THE CODE INCLUDES AN OPERATING SYSTEM THAT CAN HANDLE MANY USER ADDITIONS AND MODIFICATIONS TO THE BASIC CODE. FEATURES- \*VARIABLE PRECISION FLOATING POINT. \*BASIC DATA ENTERED IN SHARE STANDARD ELEMENT CARD FORMAT. \*ORIGINAL SIMPLEX ALGORITHM WITH SPECIAL FEATURES. \*FOUR ESSENTIAL ZERO OR TOLERANCE CONTROLS. \*FOUR OUTPUT REPORTS AVAILABLE. \*SOURCE LANGUAGE IS IBM 1410 AUTOCODER/IOCS. \*OPERATING SYSTEM WITH LIBRARIAN FACILITIES. TO SOLVE PROBLEMS HAVING UP TO 150 ROWS AND 9999 VARIABLES. REQUIREMENTS FOR 1410-CO-06X- 40,000 POSITIONS OF STORAGE. 6 MAGNETIC TAPE UNITS ON CHANNEL 1. OVERLAP AND PRIORITY SPECIAL FEATURES. PERIPHERAL IBM 1401 WITH RPC 898148.  
THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS...  
LISTINGS.  
CARD DECKS - CONDENSED PROGRAM DECK.  
ONE MAGNETIC TAPE - SYSTEM TAPE.

OPTIONAL PROGRAM MATERIAL -  
TWO MAGNETIC TAPES - CONTAINING LISTINGS, SOURCE AND OBJECT DECKS.

1410-CO-07X BASIC LINEAR PROGRAMMING  
SYSTEM CARD/ TAPE, 2 OVERLAP CHANNELS  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 1410-CO-07X

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

# IBM Programs

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TO PROVIDE A BASIC LINEAR PROGRAMMING SYSTEM WITH FLEXIBLE INPUT AND OUTPUT FACILITIES. THE CODE INCLUDES AN OPERATING SYSTEM THAT CAN HANDLE MANY USER ADDITIONS AND MODIFICATIONS TO THE BASIC CODE. FEATURES-- \*VARIABLE PRECISION FLOATING POINT. \*BASIC DATA ENTERED IN SHARE STANDARD ELEMENT CARD FORMAT. \*ORIGINAL SIMPLEX ALGORITHM WITH SPECIAL FEATURES. \*FOUR ESSENTIAL ZERO OR TOLERANCE CONTROLS. \*FOUR OUTPUT REPORTS AVAILABLE. \*SOURCE LANGUAGE IS IBM 1410 AUTOCODER/IOCS. \*OPERATING SYSTEM WITH LIBRARIAN FACILITIES. TO SOLVE PROBLEMS HAVING UP TO 150 ROWS AND 9999 VARIABLES. REQUIREMENTS FOR 1410-CO-07X-- 40,000 POSITIONS OF STORAGE, 4 MAGNETIC TAPE UNITS, AT LEAST ONE OF WHICH MUST BE ON CHANNEL 1, 1 IBM 1403 MODEL 2 OR MODEL 3 PRINTER ON CHANNEL 1, OR 1 ADDITIONAL TAPE UNIT ON EITHER CHANNEL. 2 CHANNELS. OVERLAP AND PRIORITY SPECIAL FEATURES. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*M

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. \*

BASIC PROGRAM MATERIAL --  
DOCUMENTATION -- PROGRAM WRITE-UP... OPERATING INSTRUCTIONS... LISTINGS.  
CARD DECK -- CONDENSED PROGRAM DECK.  
ONE MAGNETIC TAPE -- SYSTEM TAPE.

OPTIONAL PROGRAM MATERIAL --  
TWO MAGNETIC TAPES -- CONTAINING LISTINGS, SOURCE AND OBJECT DECKS.

1410-CO-09X BASIC LINEAR PROGRAMMING \*M  
SYSTEM CARD/ TAPE, 1 NON-OVERLAP CHANNEL  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 1410-CO-09X

TO PROVIDE A BASIC LINEAR PROGRAMMING SYSTEM WITH FLEXIBLE INPUT AND OUTPUT FACILITIES. THE CODE INCLUDES AN OPERATING SYSTEM THAT CAN HANDLE MANY USER ADDITIONS AND MODIFICATIONS TO THE BASIC CODE. FEATURES-- \* VARIABLE PRECISION FLOATING POINT. \*BASIC DATA ENTERED IN SHARE STANDARD ELEMENT CARD FORMAT. \*ORIGINAL SIMPLEX ALGORITHM WITH SPECIAL FEATURES. \*FOUR ESSENTIAL ZERO OR TOLERANCE CONTROLS. \*FOUR OUTPUT REPORTS AVAILABLE. \*SOURCE LANGUAGE IS IBM 1410 AUTOCODER/IOCS. \*OPERATING SYSTEM WITH LIBRARIAN FACILITIES. TO SOLVE PROBLEMS HAVING UP TO 150 ROWS AND 9999 VARIABLES. REQUIREMENTS FOR 1410-CO-09X-- 40,000 POSITIONS OF STORAGE, 4 MAGNETIC TAPE UNITS ON CHANNEL 1, CARD READER ON CHANNEL 1, 1 IBM 1403 MODEL 2 OR MODEL 3 PRINTER ON CHANNEL 1, OR 1 ADDITIONAL TAPE UNIT ON CHANNEL 1. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*M

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. \*

BASIC PROGRAM MATERIAL --  
DOCUMENTATION -- PROGRAM WRITE-UP... OPERATING INSTRUCTIONS... LISTINGS.  
CARD DECK -- CONDENSED PROGRAM DECK.  
ONE MAGNETIC TAPE -- SYSTEM TAPE.

OPTIONAL PROGRAM MATERIAL --  
TWO MAGNETIC TAPES -- CONTAINING LISTINGS, SOURCE AND OBJECT DECKS.

1410-CO-10X 1410/7010 LINEAR PROGRAMMING \*M  
SYSTEM  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 1410-CO-10X

THE IBM 1410/7010 LINEAR PROGRAMMING SYSTEM IS A GENERAL PURPOSE SYSTEM DESIGNED TO PROVIDE THE USERS OF IBM 1410 OR 7010 DATA PROCESSING SYSTEMS WITH THE MEANS FOR APPLYING THE SOPHISTICATED MATHEMATICAL TECHNIQUES OF LINEAR PROGRAMMING. THESE TECHNIQUES ARE MOST FREQUENTLY USED TO DETERMINE A MORE ECONOMICALLY PROFITABLE ALLOCATION OF RESOURCES SUCH AS CAPITAL, RAW MATERIALS, MANPOWER, PLANT CAPACITY, ETC. THEY CAN ALSO BE USED TO ANALYZE THE ECONOMICS OF ALTERNATE AVAILABLE RESOURCES, ALTERNATE PLANNING OBJECTIVES, ALTERNATE PRODUCTION OR DISTRIBUTION TECHNOLOGIES, ETC. THE OPTIMUM BLENDING OF PRODUCTS /GASOLINE, ANIMAL FEEDS, METAL ALLOYS, FLOUR, ETC./ IS ROUTINELY DETERMINED BY THESE TECHNIQUES. THEY ARE ALSO WIDELY USED IN PROCESS INDUSTRIES /PETROLEUM, PAPER, CHEMICALS AS WELL AS IN THE AGRICULTURAL PRODUCTS, TEXTILES, FINANCE, AND OTHER INDUSTRIES.

FEATURES ARE--  
VARIABLE PRECISION FLOATING POINT.  
BASIC DATA ENTERED IN THE SHARE FORMAT.  
PARAMETRIC LINEAR PROGRAMMING STUDIES MAY BE MADE FROM AN OPTIMAL SOLUTION.  
INVERSION CAPABILITIES.  
FLEXIBLE PARTITIONING AVAILABLE.  
PRE-SPECIFIED BASIS MAY BE HANDLED.  
TEN NUMERICAL TOLERANCE CONTROLS.  
FIVE OUTPUT REPORTS AVAILABLE.  
INTERRUPT CAPABILITIES INCLUDING CHECKPOINT AND INTERMEDIATE OUTPUT REPORTS.  
THE CODE HANDLES UP TO FOUR OBJECTIVE ROWS INDIVIDUALLY OR IN COMBINATION.  
UP TO FOUR CONSTANT VECTORS /RHS/ ARE AVAILABLE INDIVIDUALLY OR IN COMBINATION.

PROGRAMMING SYSTEMS-- THIS PROGRAM IS WRITTEN IN THE 1410/7010 AUTOCODER LANGUAGE, USES IOCS, AND WAS COMPILED AND OPERATES UNDER THE IBM 1410/7010 OPERATING SYSTEM; 1410-PR-155.

MINIMUM 1410 CARD/TAPE SYSTEM--  
IBM 1411 PROCESSING UNIT /40K/ MODEL 3  
FEATURE NO. 4659 INPUT/OUTPUT ADAPTER /CHANNEL 1/  
FEATURE NO. 5620 PRIORITY  
FEATURE NO. 5730 PROCESSING OVERLAP  
FEATURE NO. 7823 TAPE INPUT/OUTPUT ADAPTER /CHANNEL 1/  
1415 CONSOLE MODEL 1  
1414 INPUT/OUTPUT SYNCHRONIZER MODEL 3  
FEATURE NO. 7680 SYNCHRONIZER STORAGE -- PRINTER  
FEATURE NO. 7681 SYNCHRONIZER STORAGE -- PRINTER, ADDITIONAL  
1402 CARD READ PUNCH MODEL 2  
1403 PRINTER MODEL 2  
1414 INPUT/OUTPUT SYNCHRONIZER MODEL 2  
FIVE 7330 MAGNETIC TAPE UNITS MODEL 1  
MINIMUM 7010 CARD/TAPE SYSTEM-- MINIMUM 7010 CARD/TAPE SYSTEM IS THE SAME AS THAT SHOWN ABOVE, EXCEPT THAT /1/ THE 1411 PROCESSING UNIT MODEL 3 IS REPLACED BY AN 7114 PROCESSING UNIT /40K/ MODEL 1 WITH FEATURE NO. 7823, AND /2/ THE 1415 CONSOLE

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CONTINUED FROM PRIOR COLUMN--

MODEL 1 IS REPLACED BY A MODEL 2.  
MINIMUM 1410 TAPE-ORIENTED SYSTEM--  
IBM 1411 PROCESSING UNIT /40K/ MODEL 3  
FEATURE NO. 5620 PRIORITY  
FEATURE NO. 5730 PROCESSING OVERLAP  
FEATURE NO. 7823 TAPE INPUT/OUTPUT ADAPTER /CHANNEL 1/  
1415 CONSOLE MODEL 1  
1414 INPUT/OUTPUT SYNCHRONIZER MODEL 1  
SEVEN 7330 MAGNETIC TAPE UNITS MODEL 1  
MINIMUM 7010 TAPE-ORIENTED SYSTEM-- A MINIMUM 7010 TAPE-ORIENTED SYSTEM IS THE SAME AS THAT SHOWN ABOVE, EXCEPT THAT /1/ THE 1411 PROCESSING UNIT MODEL 3 IS REPLACED BY A 7114 PROCESSING UNIT /40K/ MODEL 1 WITH FEATURES NO. 4659 AND NO. 7823, AND /2/ THE 1415 CONSOLE MODEL 1 IS REPLACED BY A MODEL 2. A 1410 OR 7010 TAPE-ORIENTED SYSTEM REQUIRES A PERIPHERAL 1401 SYSTEM.

BASIC PROGRAM MATERIAL --  
DOCUMENTATION -- PROGRAM WRITE-UP... APPLICATION DIRECTORY... APPLICATION DESCRIPTION... USER MANUAL... OPERATOR MANUAL.  
MACHINE READABLE -- ONE REEL CONTAINING PROGRAM OBJECT MODULES AND A DTR CONTAINING THE LINKAGE LOADER DECK AND TWO SAMPLE PROBLEM DECKS.  
THE TAPE NECESSARY TO OBTAIN THE PROGRAM MATERIAL MAY BE SUPPLIED OR ORDERED FROM YOUR IBM REPRESENTATIVE. THE TAPE SHOULD BE 2400 FEET IN LENGTH.

1410-EE-01X ENGINEERING BLOCK DIAGRAM \*M  
PROGRAM  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 1410-EE-01X

DESCRIPTION-- THE 1410 ENGINEERING BLOCK DIAGRAM PROGRAM CONTAINS A SET OF TWO 1410 PROGRAMS TO DRAW AND UPDATE BASIC AND DETAILED LOGIC DIAGRAMS FOR ELECTRONIC SWITCHING SYSTEMS, AND A 1401 AUXILIARY PROGRAM TO PRINT THE DIAGRAM PAGES. THE PROGRAM CAPTURES DATA TRANSCRIBED FROM THE ENGINEERS SKETCH SHEET, ESTABLISHES A MASTER FILE, AND SUBSEQUENTLY PRINTS THE DIAGRAMS AS FINAL ENGINEERING DOCUMENTS. CHANGES CAN BE MADE TO THE DIAGRAMS AND THE INFORMATION WITH MINIMUM TIME, COST, AND EFFORT. APPLICATION WILL BE FOUND IN ENGINEERING STAFFS WORKING WITH TELEPHONE COMMUNICATION SYSTEMS, CONTROL SYSTEMS, COMPUTER SYSTEMS, AND SIMILAR DESIGN AREAS. ADVANTAGES TO THE USER INCLUDE-- REDUCED DRAFTING COSTS... REDUCED CHANGE COSTS... SPEED-UP OF DRAWING PRODUCTION... FAST RESPONSE TO CHANGES... ACCURATE AND CONSISTENT PRODUCTION OF DRAWINGS... CAPTURED, INFORMATION FROM FUTURE DRAWINGS /FROM ENGINEERING INFORMATION IN THE MASTER FILE, ADDITIONAL USERS PROGRAMS CAN PROVIDE COMPONENT LISTS, WIRE LISTS, LOCATION LISTS, SIGNAL LISTS, AND DESIGN CHECKING ERRATA LISTS./

FEATURES-- THE MACHINE PRINTED PAGE PROVIDES--  
- UP TO 54 BLOCKS PER PAGE  
- UP TO 30 CHARACTERS OF INFORMATION IN A BLOCK  
- 16 INPUT/OUTPUT LINES TO AND FROM BLOCKS  
- 88 INPUT/OUTPUT LINES TO AND FROM THE DIAGRAM PAGE  
- 15 LINES /120 CHARACTERS PER LINE/ FOR FOOTNOTES  
- BLOCK PERIMETERS MAY BE REMOVED  
- MULTIPLE COPIES READILY PRODUCED

USE-- THE ENGINEER SKETCHES HIS DESIGN ON A SPECIAL LOGIC SKETCH SHEET. THE INFORMATION IS TRANSCRIBED AND KEYPUNCHED TO PROVIDE INPUT FOR THE BLOCK-UPDATE PROGRAM, WHICH PROCESSES IT TO PROVIDE INITIAL INFORMATION FOR THE MASTER FILE. THE BLOCK-UPDATE RUN PROVIDES SELECTED PAGES /DIAGRAMS/ FOR THE BLOCK-WRITE PROGRAM, ALONG WITH THE NEW MASTER FILE TAPE AND AN INDEX OF THE MASTER FILE.

THE BLOCK-WRITE PROGRAM PROCESSES THE SELECTED PAGES TAPE TO PRODUCE THE PAGE OUTPUT TAPE, WHICH IS THEN PRINTED BY THE AUXILIARY PROGRAM TO FURNISH THE DESIRED LOGIC DIAGRAM. PROGRAMMING SYSTEMS ARE WRITTEN IN AUTOCODER LANGUAGE, USING IOCS, ASSEMBLED UNDER THE 1410 PROCESSOR OPERATING SYSTEM /1410-PR-108/.

MINIMUM SYSTEM REQUIREMENTS-- A 40K 1410 SYSTEM WITH SIX MAGNETIC TAPE UNITS -- IF INPUT/OUTPUT OPERATIONS ARE RUN ON THIS SYSTEM IN COMPATIBILITY MODE, ADD 1402 CARD READ PUNCH AND 1403 PRINTER MODEL 2, SEE RECOMMENDED CHAIN CHARACTER ABOVE.  
INPUT/OUTPUT OPERATIONS ARE PERFORMED ON A 1401 SYSTEM WITH ADVANCED PROGRAMMING AND HIGH-LOW-EQUAL COMPARE... ONE MAGNETIC TAPE UNIT... 1402 CARD READ PUNCH... 1403 PRINTER MODEL 2, SEE RECOMMENDED CHAIN CHARACTERS ABOVE.

PUNCHING OF THE 1410 OBJECT DECKS FOR PREPARING PROGRAM TAPES REQUIRES A 1-4K 1401 WITH 1402 CARD READ PUNCH... 1403 PRINTER... ONE MAGNETIC TAPE UNIT... PLUS A NO-CHARGE RPK /NO. 898148/ ON THE 1401 UNIT FOR PROPER PUNCHING OF THE 8-2 PUNCH.

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. \*M

BASIC PROGRAM MATERIAL --  
DOCUMENTATION -- PROGRAM WRITE-UP... APPLICATION DIRECTORY... APPLICATION DESCRIPTION... PROGRAMMERS MANUAL... OPERATORS MANUAL.  
MAG. TAPE -- ONE REEL CONTAINING... OBJECT DECKS... SOURCE DECKS... LISTINGS FOR THE BLOCK-UPDATE AND BLOCK WRITE PROGRAMS... ONE SET OF SIX CARDS, INCLUDING OBJECT AND SOURCE DECKS FOR 1401 AUXILIARY PROGRAM... CONTROL CARDS... SAMPLE PROBLEM RUNS... 1410 LOAD PROGRAM.

OPTIONAL PROGRAM MATERIAL -- SYSTEMS MANUAL.

1410-FO-138 FORTRAN SUBROUTINE LIBRARY \*M  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 1410-FO-138

THE DISTRIBUTION OF THE FORTRAN SUBROUTINE LIBRARY IS IN CARDS IN ABSOLUTE FORMAT. THE AUTOCODER MIXED OUTPUT TAPE FOR 1410-FO-138 CONTAINING THE LIBRARY SUBROUTINE AND THE RELOCATABLE LOADER /TOTAL OF 51 FILES/ IS NO LONGER TO BE INCLUDED IN ANSWER TO REQUESTS FOR THE 1410 FORTRAN SUBROUTINE LIBRARY. HOWEVER, THE TAPE IS AVAILABLE AS AN OPTIONAL PROGRAM ITEM FOR THOSE WHO REQUEST SYMBOLIC LISTINGS AND PROGRAM DECKS. INFORMATION CONTAINED IN MATERIAL AVAILABLE TO USERS OF 1410-PR-108 /ADDENDUM FOR FORTRAN AND FORTRAN SUBROUTINES/ AND 1410-PR-134 /ADDENDUM TO IBM 1410 PROCESSOR OPERATING SYSTEM USING IBM 1301 DISK STORAGE/ APPENDIX C CONTAINS INSTRUCTIONS FOR CONSTRUCTING AND MAINTAINING A FORTRAN LIBRARY TAPE.

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1410-IL-06X 62 CFO /CONSOLIDATED  
FUNCTIONS ORDINARY/ DAILY CYCLE AND VALUATION PROGRAMS  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 1410-1L06X

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CONTINUED FROM PRIOR COLUMN--

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... 62 CFO VOLUME 20 /1410  
POLICY MASTER RECORD CODE BOOK/ PLUS VOLUMES 23 THROUGH  
36.  
CARD DECKS - A PROGRAM, IN OBJECT DECK FORM, DESIGNED TO ADD  
TO OR CHANGE PROGRAMS ON THE 62 CFO PROGRAM TAPE AND TO  
DELETE, EXTRACT, LIST OR PUNCH PROGRAMS FROM THAT TAPE.  
ONE MAG. TAPE - SOURCE PROGRAM CARDS FOR 40 62 CFO PROGRAMS,  
THE ,GET,, AND ,PUT,, MACRO-INSTRUCTIONS... TWO 1401  
RATE TAPE GENERATION PROGRAMS TO BE RUN IN COMPATIBILITY  
MODE AND MORTALITY TABLES.

1410-PR-108 PROCESSOR OPERATING SYSTEM  
TAPE  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 1410-PR-108

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THE FOLLOWING PROGRAMS ARE CONTAINED ON THIS SYSTEM TAPE.  
1410 AUTOCODER 140-AU-906  
1410 COBOL 1410-CB-912  
1410 FORTRAN 1410-FO-913  
1410 FORTRAN /SUBROUTINES/ /SEE 1410-FO-913/  
1410 FORTRAN 40K PROCESSOR 1410-FO-950  
1410 INPUT/OUTPUT CONTROL SYSTEM 1410-IO-926  
1410 REPORT PROGRAM GENERATOR 1410-RG-910  
1410 SYSTEMS SUPERVISOR 1410-SV-907

AUTOCODER  
1410-AU-906

THE 1410 AUTOCODER RELIEVES THE USER FROM WRITING  
HIS ROUTINES IN MACHINE LANGUAGE. HE CAN WRITE HIS ROUTINE  
USING A WELL DEFINED SET OF MNEMONIC OPERATION CODES IN  
CONJUNCTION WITH USEFUL AND SIGNIFICANT LABELS, WHICH HE  
DEFINES, AND THEN PROCESSES WITH AUTOCODER TO PRODUCE  
AN OPERATING SYSTEM DECK. HE MAY ALSO WRITE MACRO  
STATEMENTS AND INCLUDE SUBROUTINES IN THE LIBRARY. A MORE  
DETAILED DESCRIPTION OF THIS PROGRAM IS CONTAINED IN THE  
AUTOCODER BULLETIN LISTED IN THE REFERENCES. MACHINE  
CONFIGURATION 1. 20K STORAGE. 2. FOUR IBM MAGNETIC TAPE  
UNITS. 3. AN IBM 1402\* 4. AN IBM 1403\* \*OPTIONS ARE  
AVAILABLE TO TRADE 1, 2, OR 3 MAGNETIC TAPE UNITS FOR THE  
1402 AND 1403 UNIT RECORD DEVICES.

COBOL PROCESSOR  
1410-CB-912

1410 COBOL PROCESSOR ACCEPTS PROGRAMS WRITTEN IN THE COBOL  
LANGUAGE AS INPUT AND PRODUCES COMPLETE OBJECT PROGRAMS  
TO PERFORM THE FUNCTIONS SPECIFIED IN THE SOURCE  
STATEMENTS.

THE PROCESS INVOLVES A COBOL RUN /WHICH PRODUCES COBOL  
DIAGNOSTICS AND THE SOURCE PROGRAM TRANSLATED INTO  
AUTOCODER LANGUAGE AND FORMAT/ FOLLOWED BY AN AUTOCODER RUN  
/WHICH PRODUCES THE OBJECT PROGRAM ASSEMBLY LISTING AND A  
CONDENSED DECK/. THE PROCESS IS CONTINUOUS AND COMPLETE  
IF- 1. NO SERIOUS DIAGNOSTIC ERRORS ARE DISCOVERED, AND  
2. IF THE SYSTEM CONFIGURATION PROVIDES TAPE INPUT TO THE  
AUTOCODER PROCESSOR.

THE MINIMUM MACHINE CONFIGURATION REQUIRED BY THE COBOL  
PROCESSOR IS- 1. 20K STORAGE 2. IBM 1402 CARD PUNCH  
MODEL 2 3. IBM 1403 PRINTER, MODEL 2 4. FOUR IBM 729 II,  
IV, V OR 7330 MAGNETIC TAPE UNITS.

THE LISTING TAPES FOR SUBJECT SYSTEMS ARE THE STANDARD  
OUTPUT TAPES PRODUCED BY 1410 AUTOCODER AS DESCRIBED IN THE  
OPERATORS GUIDE FOR SYSTEM SUPERVISOR AND AUTOCODER. THEY  
CONTAIN THE SELF LOADING 1401 PROGRAM WHICH PRINTS AND  
PUNCHES THE CONTENTS OF THE TAPE. THE OPERATING PROCEDURE  
FOR THIS PROGRAM IS IN THE SYSTEM SUPERVISOR OPERATORS  
GUIDE. WHILE THE TAPE WILL NORMALLY BE USED TO PRODUCE  
PRINTED LISTINGS, IT MAY ALSO BE USED TO OBTAIN SYMBOLIC  
DECKS.

FORTRAN /FORMULA TRANSLATING/ II PROCESSOR  
1410-FO-913

THE 1410 FORTRAN /FORMULA TRANSLATING/ II PROCESSOR IS A  
1410 MACHINE LANGUAGE PROGRAM. THIS PROGRAM CONVERTS A  
SOURCE PROGRAM WRITTEN IN THE FORTRAN II LANGUAGE /WHICH  
CLOSELY RESEMBLES THE LANGUAGE OF MATHEMATICS/ INTO AN  
OBJECT PROGRAM READY TO RUN ON THE IBM 1410. THE FORTRAN  
PROCESSOR THUS MAKES IT POSSIBLE FOR PERSONNEL TRAINED IN  
MATHEMATICS BUT NOT IN PROGRAMMING TO PREPARE PROBLEMS FOR  
THE COMPUTER.

THE PROCESSOR IS USED IN TWO PHASES. A FORTRAN PHASE AND  
AN AUTOCODER PHASE. DURING THE FORTRAN PHASE, THE  
PROCESSOR COMPILES A SYMBOLIC PROGRAM IN AUTOCODER FORMAT.  
DURING THE AUTOCODER PHASE, THE PROCESSOR CONVERTS THIS  
AUTOCODER PROGRAM INTO A 1410 OBJECT PROGRAM.

THE MINIMUM MACHINE CONFIGURATION REQUIRED BY THE FORTRAN  
II PROCESSOR IS- 1. 20K STORAGE 2. FOUR IBM 729 II, IV, V  
OR 7330 MAGNETIC TAPE UNITS 3. ONE IBM 1402 CARD  
READ-PUNCH\* 4. ONE IBM 1403 PRINTER MODEL 2 \*OPTIONS ARE  
1410 FORTRAN /SUBROUTINES/ 1410-FO-138 /SEE 1410-FO-913/  
AVAILABLE TO TRADE 1, 2, OR 3 MAGNETIC TAPE UNITS FOR THE  
1402 AND 1403 UNIT RECORD DEVICES.  
OUTPUT TAPES PRODUCED BY 1410 AUTOCODER AS DESCRIBED IN THE  
OPERATORS GUIDE FOR SYSTEM SUPERVISOR AND AUTOCODER. THEY  
CONTAIN THE SELF-LOADING 1401 PROGRAM WHICH PRINTS AND  
PUNCHES THE CONTENTS OF THE TAPE. THE OPERATING PROCEDURE  
FOR THIS PROGRAM IS IN THE SYSTEM SUPERVISOR OPERATORS  
GUIDE. WHILE THE TAPE WILL NORMALLY BE USED TO PRODUCE  
PRINTED LISTINGS, IT MAY ALSO BE USED TO OBTAIN SYMBOLIC  
AND CONDENSED DECKS.

FORTRAN /40K/ PROCESSOR  
1410-FO-950

THE FORTRAN /40K/ PROCESSOR CAN REPLACE THE INITIAL  
FORTRAN /20K/ PROCESSOR FOR IBM 1410 SYSTEM WITH 40,000 OR  
MORE CORE-STORAGE POSITIONS. THIS PROCESSOR TAKES  
ADVANTAGE OF THE LARGER CORE-STORAGE CAPACITIES BY USING  
LARGER TABLES FOR PROCESSING SOURCE STATEMENTS. THE  
FORTRAN /40K/ PROCESSOR ALSO PROVIDES MORE COMPLETE  
DIAGNOSTIC CHECKING AND FASTER COMPILATION THAN THE 20K  
PROCESSOR. IN A SERIES OF COMPILATION TESTS, USING SAMPLE  
SOURCE PROGRAMS SUBMITTED BY PERSONNEL IN THE FIELD,

DESCRIPTION- THE 27 DAILY CYCLE PROGRAMS MEET DATA PROCESSING  
REQUIREMENTS FOR ORDINARY LIFE INSURANCE COMPANIES IN THE  
FOLLOWING AREAS- /1/ INPUT PREPARATION TO THE DAILY CYCLE  
/BALANCE, SORT, EDIT/... /2/ DAILY CYCLE PROCESSING FOR ALL  
POLICIES CONTAINED IN THE MASTER FILE /FILE MAINTENANCE,  
ACCOUNTING, COMMISSION, BILLING, LOAN OR NONFORFEITURE/  
CALCULATIONS AND TERMINATIONS/... /3/ PREPARATION OF DAILY  
ACCOUNTING JOURNALS... /4/ PERIODIC FILE UPDATING RUNS  
/DIVIDENDS, CASH VALUES, AND RENEWABLE TERM PREMIUMS/.  
THE SERIES OF 13 VALUATION PROGRAMS, DESIGNED TO OPERATE  
EXCLUSIVELY IN THE AREA OF VALUATION AND IN THE PREPARATION OF  
THE POLICY EXHIBIT, ASSUME A STANDARD 62 CFO RECORD  
FORMAT. PROCESSING MAY BE PERFORMED ON A STANDARD ANNUAL BASIS  
OR AT ANY MORE FREQUENTLY DESIRED CYCLE SUCH AS SEMI-ANNUALLY,  
QUARTERLY, OR MONTHLY. ALL INFORMATION FURNISHED BY THESE  
PROGRAMS COMES EXCLUSIVELY FROM PAID BUSINESS IN THE FILE ON THE  
VALUATION DATE AND DOES NOT PERTAIN TO SUPPLEMENTARY FILES.  
POLICY EXHIBIT AND RESERVES RELEASED ARE BASED ON ACTIVITY TO THE  
POLICY MASTER EXHIBIT DURING THE REPORTING PERIOD.  
THESE PROGRAMS PROVIDE FOR AUTOMATIC PROCESSING OF ALL  
SCHEDULED TRANSACTIONS AND REQUESTED PROCESSING OF ALL  
NON-SCHEDULED TRANSACTIONS INVOLVING ORDINARY LIFE CONTRACTS.  
EXCEPTIONS TO THIS WILL OCCUR ONLY WHEN THE POLICY IS ISSUED  
UNDER EXTREMELY UNUSUAL ARRANGEMENTS. THE SYSTEM  
CONSOLIDATES ALL POLICY INFORMATION INTO A SINGLE MAGNETIC TAPE  
RECORD AND INTEGRATES ALL PROCESSING FUNCTIONS WITHIN A SINGLE  
COMPUTER SYSTEM. THE STANDARD VALUATION PROGRAMS BEGIN WITH  
PAYMENT AND CONTINUES THROUGH MATURE POLICY OR ANY OTHER FORM  
OF TERMINATION. ACCOUNTING AND COMMISSION RECORDS AS WELL AS  
POLICY EXHIBIT TRANSACTIONS ARE GENERATED AUTOMATICALLY AND  
BROUGHT FORWARD UNDER PROGRAM CONTROL FOR MONTH-END PROCESSING  
OR FOR VALUATION PURPOSES.  
FEATURES- 62 CFO DAILY CYCLE PROGRAMS PROVIDE LIFE INSURANCE  
COMPANIES WITH OPERATIONAL EFFICIENCY, AND- /1/ DAILY  
ANALYSIS OF ALL POLICY RECORDS FOR ANY FORM OF ACTIVITY...  
/2/ CONTINUOUS CONTROL OF THE POLICY MASTER FILE... /3/ POLICY  
INFORMATION FOR ACCOUNTING JOURNALS, COMMISSION STATEMENTS,  
NOTIFICATION, POLICYHOLDER SERVICE AND VALUATION REPORTS FROM A  
SINGLE SOURCE... /4/ ORGANIZATION OF OUTPUT FROM THE SYSTEM  
INTO MEANINGFUL PRINTED REPORTS. THE VALUATION PROCEDURES WERE  
DESIGNED TO GATHER STANDARD VALUATION PRACTICES AND TO  
FURNISH THE MAXIMUM AMOUNT OF INFORMATION AVAILABLE FROM A  
CURRENT CONSOLIDATED POLICY MASTER FILE. ALL RESERVES AND NET  
PREMIUMS ARE STORED ON MACHINE-GENERATED RATE TAPES AND ARE  
ASSOCIATED WITH EACH POLICY RECORD ONLY AT THE TIME OF  
VALUATION, ELIMINATING THE NEED TO STORE EXCESSIVE VALUATION  
INFORMATION AS A PART OF EACH POLICY RECORD. THE MAJOR FEATURES  
OF THE OVERALL APPROACH ARE- /1/ USING THE DAILY CYCLE  
PROGRAMS, CONTROL OF THE POLICY MASTER FILE MAINTAINED ON A  
CURRENT DAILY BASIS FOR THE NUMBER OF POLICIES, IMPAIRMENT, ALL  
FORMS OF DEPOSITS, AND SUSPENSE ITEMS, ELIMINATING THE NEED FOR  
PREPARATORY WORK BEFORE THE BEGINNING OF A VALUATION... /2/ ALL  
ELEMENTS OTHER THAN LEGAL RESERVES ARE CARRIED AS LEDGER  
ITEMS. EACH DETAIL ITEM NEEDED FOR A VALUATION IS EXTRACTED FROM  
THE POLICY MASTER FILE ON AN INDIVIDUAL BASIS FOR REPORTING  
PURPOSES. ALLOWING COMPLETE FLEXIBILITY IN REPORTING  
TECHNIQUES... /3/ RESERVES ARE COMPUTED FOR PREMIUM PAYING  
POLICIES, ALL FORMS OF PAID-UP POLICIES, AND FOR EACH OF THE  
VARIIOUS TYPES OF SUPPLEMENTAL BENEFITS AND EXTRA LIFE  
PREMIUMS... /4/ DEFERRED AND UNCOLLECTED PREMIUMS ARE COMPUTED ON  
BOTH A GROSS AND NET BASIS. IN ADDITION, GROSS ADVANCE PREMIUMS  
ARE CALCULATED... /5/ AMOUNTS OF THE ENTIRE MASTER  
POLICY FILE ARE COMPUTED, MAINTAINED, AND REPORTED AS A PART OF  
THE VALUATION PROCEDURE... /6/ REPORTS ARE AVAILABLE AS A DETAIL  
LISTING OF EACH ITEM, BY VALUATION CELL, BY PLAN, AND BY METHOD OF  
VALUATION, MORTALITY TABLE, AND INTEREST RATE.  
USE- 62 CFO DAILY CYCLE PROGRAMS ASSUME THE DEVELOPMENT OF A  
COMPLETE POLICY MASTER FILE BY EACH USER. TO HELP IN THE DATA  
GATHERING NECESSARY FOR A CONSOLIDATED FILE, 1401 PROGRAMS ARE  
NOW AVAILABLE FOR OPERATION IN COMPATIBILITY MODE TO  
GENERATE RESERVE, NET PREMIUM AND MINIMUM CASH VALUE RATE  
TAPES. RATE-TAPE PHILOSOPHY HAS BEEN INCORPORATED INTO THE  
OVERALL SYSTEM TO FACILITATE THE HANDLING OF ANY TYPE OF  
UPDATING REQUIRED AND IN MANY CASES ELIMINATE THE NECESSITY FOR  
DATA GATHERING.  
USER RESPONSIBILITY CONSISTS OF THE FOLLOWING MAJOR AREA-  
/1/ GATHERING DATA NECESSARY TO ESTABLISH A POLICY MASTER  
RECORD... /2/ PREPARATION OF CONVERSION PROGRAMS WHICH WILL  
CONVERT GATHERED DATA INTO AN ACCEPTABLE FORMAT...  
/3/ PREPARATION OF NEW BUSINESS PROGRAMS WHICH WILL CONVERT NEW  
ISSUE DATA INTO AN ACCEPTABLE FORMAT... /4/ PREPARATION OF A  
PRINT PROGRAM FOR PREMIUM AND ANNIVERSARY  
NOTICES... /5/ PREPARATION OF CASH VALUE AND DIVIDEND RATE  
TAPES, RENEWABLE TERM PREMIUM RATE CARDS, AGENTS CONTROL RECORDS,  
AND COMMISSION TABLES.  
DAILY CYCLE PROGRAMS MAY BE USED AS THEY ARE OR WITH SLIGHT  
MODIFICATIONS TO FACILITATE AUDITING NEWLY CONVERTED POLICY  
RECORDS. DIVIDEND, CASH VALUE AND RENEWABLE TERM UPDATING  
PROGRAMS CAN ALSO BE USED AS CONVERSION PROGRAMS. DAILY CYCLE  
PROGRAMS WILL OPERATE UPON ANY PROPERLY CONVERTED BLOCK OF  
POLICIES ON EITHER A DAILY OR PERIODIC SCHEDULE.  
62 CFO VALUATION MAY BE TAKEN ON EITHER A PARTIAL BASIS OR A  
COMPLETE BASIS AS OF ANY MONTH END. MINIMUM RESULTS WILL  
INVOLVE- /1/ LOAN BALANCES WITH EITHER ACCRUED OR UNEARNED  
INTEREST ADJUSTMENTS... /2/ AMOUNTS ON DEPOSIT WITH ACCRUED  
INTEREST... /3/ SUSPENSE TOTALS OF UNAPPLIED CASH OR RETURNED  
ITEMS... /4/ LIFE RESERVES AND CORRESPONDING PREMIUM  
ADJUSTMENTS... /5/ POLICY EXHIBIT CHANGES WITHIN THE REPORTING  
PERIOD... /6/ SUMMARY REPORTS OF EACH OF THE ABOVE ITEMS.  
ADDITIONAL RESULTS FROM A FULL VALUATION WILL INCLUDE ALL OF THE  
ABOVE AS WELL AS- /1/ DEFICIENT RESERVES... /2/ TOTALS FOR ANNUAL  
STATEMENT PAGE 15 AND STATE POLICY EXHIBITS, AND A DETAIL  
LISTING OF CHANGES... /3/ RESERVES RELEASED AND TABULAR NET  
PREMIUM ADJUSTMENTS... /4/ EITHER SUMMARY OR DETAIL REPORTS OF  
ALL VALUATION ITEMS.  
PROGRAMMING SYSTEMS- THE PROGRAM SOURCE CARDS DISTRIBUTED FOR  
THIS SYSTEM ARE WRITTEN AS INPUT FOR ASSEMBLY UNDER THE IBM 1410  
AUTOCODER WITH IQCS. THE USER IS EXPECTED TO HAVE A CURRENT  
VERSION OF THE 1410/729 TAPE PROCESSOR SYSTEM /1410-PR-108/  
AVAILABLE IN HIS INSTALLATION TO MAKE USE OF THE PROGRAM  
MATERIAL.  
MINIMUM SYSTEM REQUIREMENTS- 40K 1410 SYSTEM WITH PRIORITY  
PROCESSING, PROCESS OVERLAP. 1402 CARD READ PUNCH MDL 2... 1403  
PRINTER MDL 2... TWO CHANNELS-THREE MAGNETIC TAPE UNITS ON  
CHANNEL 1 AND TWO MAGNETIC TAPE UNITS ON CHANNEL 2.  
THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM  
REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE  
TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL  
REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

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TIMING COMPARISONS WERE MADE BETWEEN THE FORTRAN /20K/ PROCESSOR AND THE FORTRAN /40K/ PROCESSOR. THE RESULTS OF THESE COMPARISONS ARE PRESENTED IN THE TABLE BELOW. /THE TESTS WERE MADE ON A 40K 1410 SYSTEM, USING SIX 729 VI MAGNETIC TAPE UNITS/.

	BATCH 1	BATCH 2	BATCH 3	BATCH 4
NO. OF PROGRAMS	9	4	18	1
COMPILED SIZE	60,000	64,000	39,000	60,000
FORTRAN /20K/	79 MIN.	82 MIN.	83 MIN.	85 MIN.
FORTRAN /40K/	12.5 MIN.	18 MIN.	13 MIN.	28 MIN.

THE FORTRAN /40K/ PROCESSOR COMPILES DIRECTLY INTO RELOCATABLE, MACHINE-LANGUAGE OBJECT PROGRAMS. A SYMBOLIC LISTING OF THE OBJECT PROGRAM CAN BE PRODUCED WITH EACH COMPILATION. THE FORTRAN /40K/ PROCESSOR OPERATES UNDER 1410 PROCESSOR OPERATING SYSTEM AND USES THE CURRENT FORTRAN LOADER AND LIBRARY TAPE. FURTHERMORE, PROGRAMS AND SUBPROGRAMS COMPILED WITH THE AUTOCODER OR FORTRAN /20K/ PROCESSOR CAN BE LOADED WITH PROGRAMS AND SUBPROGRAMS COMPILED WITH THE NEW PROCESSOR. FOR COMPILATION OF SOURCE PROGRAMS, 40K 1410 SYSTEM WITH, FOUR MAGNETIC TAPE UNITS /729 OR 7330/, ONE 1402 CARD READ PUNCH MODEL 2 /OR A TAPE UNIT/ AND, ONE 1403 MODEL 2 /OR A TAPE UNIT/. /NOTE- OUTPUT FOR THE PUNCH AND PRINTER CAN BE COMBINED ON ONE TAPE UNIT/. FOR EXECUTION OF OBJECT PROGRAMS- IN ADDITION TO THE MACHINE REQUIREMENTS FOR THE OBJECT PROGRAMS PROCESSING, TWO TAPE UNITS MUST BE PROVIDED. ONE OF THESE UNITS IS FOR THE FORTRAN LOADER AND LIBRARY- THE OTHER IS USED AS A WORK FILE BY THE LOADER AT LOAD TIME AND IS THEN AVAILABLE TO THE OBJECT PROGRAM.

## INPUT/OUTPUT CONTROL SYSTEM 1410-IO-926

THIS PROGRAM PROVIDES USERS OF THE IBM PROGRAMMED TRANSMISSION CONTROLS /PTC/ WITH READ, WRITE, CONTROL, AND ERROR DETECTION ROUTINES FOR TRANSFERRING INFORMATION BETWEEN THE IBM 1410 AND THE PTC. THESE ROUTINES ARE COMPLETELY WRITTEN AND TESTED. THIS IOCS ALSO CONTAINS ROUTINES THAT SAVE AND REPORT THE STATUS OF THE 1410 WHEN AN INTERRUPT OCCURS AND THAT SCHEDULE THE TRANSFER OF CONTROL TO THE USER'S DATA-HANDLING ROUTINES. THE 1410 IOCS FOR PTC HAS THE FOLLOWING MINIMUM MACHINE REQUIREMENTS- 20,000 POSITIONS OF CORE STORAGE, PROCESSING OVERLAP AND PRIORITY SPECIAL FEATURES, ONE OR MORE TELECOMMUNICATION DEVICES ATTACHED TO AN IBM 7750 OR AN IBM 1440-1448.

## REPORT PROGRAM GENERATOR 1410-RG-910

THE REPORT PROGRAM GENERATOR ACCEPTS REPORT SPECIFICATIONS AND PRODUCES A SYMBOLIC PROGRAM DECK /AUTOCODER FORMAT/ FOR THE DESIRED REPORT PROGRAM. THE GENERATED REPORT PROGRAM CAN PRODUCE A WIDE RANGE OF FORMATS, EXTRACTING ITS DATA FROM A CALCULATIONS AT ANY POINT IN THE REPORTING PROCESS. RPG-GENERATED PROGRAMS UTILIZE THE 1410 IOCS. MACHINE CONFIGURATION 1. FOR RPG /I/O GENERATE THE REPORT PROGRAM/- 20K STORAGE... 1402 CARD READ PUNCH... TWO MAGNETIC TAPE UNITS 2. FOR AUTOCODER /I/O ASSEMBLE THE REPORT PROGRAM/- 20K STORAGE... 1402 CARD READ PUNCH... TWO MAGNETIC TAPE UNITS 2. FOR AUTOCODER /I/O ASSEMBLE THE REPORT PROGRAM/- 20K STORAGE... 1402 CARD READ PUNCH... FOUR MAGNETIC TAPE UNITS... 1403 PRINTER, MODEL 2. 3. FOR THE REPORT PROGRAM /I/O TO PRODUCE THE REPORT/ - 20K STORAGE... 1402 CARD READ PUNCH... OTHER I/O UNITS APPROPRIATE TO THE PROGRAM.

## SYSTEMS SUPERVISOR 1410-SV-907

THE 1410 SYSTEM SUPERVISOR HAS SEVERAL FUNCTIONS IN THE OPERATION OF THE PROCESSOR OPERATING SYSTEM TAPE. 1. IN THE ROLE OF A SUPERVISOR, IT PICKS UP INFORMATION FROM CONTROL CARDS AND, ACTING UPON THIS INFORMATION, POSITIONS THE SYSTEM TAPE, CALLS IN THE REQUIRED PHASE OR PROGRAM AND THEN TURNS CONTROL OVER TO THE PROGRAM CALLED. 2. THE SYSTEM SUPERVISOR ALSO ACCOMPLISHES THE DUPLICATION OF NEW SYSTEM TAPES AS WELL AS THE MAINTENANCE OF THE SYSTEM TAPE. 3. ANOTHER PART OF THE SYSTEM SUPERVISOR IS THE LIBRARY PRINT PROGRAM, WHICH PRINTS ANY DESIRED SECTION OF THE LIBRARY THAT IS ON THE PROCESSOR OPERATING SYSTEM TAPE. MACHINE CONFIGURATION 1. 20K STORAGE. 2. TWO IBM 729 II, IV, OR 7330 MAGNETIC TAPE UNITS. 3. IBM 1402 CARD READ PUNCH. THE MACHINE CONFIGURATION FOR THE INDIVIDUAL PROGRAMS ON THE PROCESSOR OPERATING SYSTEM TAPE ARE SPECIFIED IN THE ABSTRACTS OF THE PROGRAMS. THE 1410 AUTOCODER HAS THE LARGEST MINIMUM REQUIREMENT. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP...LISTINGS...FLOWCHARTS...  
OPERATING INSTRUCTIONS.  
CARD DECKS - CONDENSED PROGRAM DECK...SAMPLE PROBLEM DECK...  
IOCS RESTART DECK.  
TWO MAGNETIC TAPES - PROCESSOR OPERATING SYSTEM TAPE /ONE TAPE/...FORTRAN 40K PROCESSOR, /ONE TAPE/.

OPTIONAL PROGRAM MATERIAL -  
EIGHT MAGNETIC TAPES - 1410-AU-906 AND 1410-SV-907 ASSEMBLY LISTINGS, /ONE TAPE/...1410-CB-912 ASSEMBLY LISTINGS, /ONE TAPE/...1410-FO-913 ASSEMBLY LISTINGS, /THREE TAPES/...1410-FO-950 AUTOCODER LANGUAGE, /ONE TAPE/...1410-RG-910 ASSEMBLY LISTING, /ONE TAPE/.

1410-PR-134 1410/1301 /DISK/ PROCESSOR  
OPERATING SYSTEM TAPE \*M  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 1410-PR-134

THE FOLLOWING PROGRAMS ARE CONTAINED ON THIS SYSTEM TAPE.  
1410 AUTOCODER 1410-AU-942  
1410 COBOL PROCESSOR 1410-CB-944  
1410 FORTRAN II PROCESSOR 1410-FO-945  
1410 FORTRAN /SUBROUTINES/ 1410-FO-138 /SEE 1410-FO-945/  
1410 INPUT/OUTPUT CONTROL SYSTEMS 1410-IO-926  
1410/1301 REPORT PROGRAM GENERATOR 1410-RG-943  
1410 SYSTEM SUPERVISOR 1410-SV-941

CONTINUED FROM PRIOR COLUMN--

## AUTOCODER 1410-AU-942

1410-AU-942 AUTOCODER. THE 1410 AUTOCODER RELIEVES THE USER FROM WRITING HIS ROUTINES IN MACHINE LANGUAGE. HE CAN WRITE HIS ROUTINES USING A WELL-DEFINED SET OF MNEMONIC OPERATION CODES IN CONJUNCTION WITH USEFUL AND SIGNIFICANT LABELS, WHICH HE DEFINES, AND THEN PROCESSES WITH AUTOCODER TO PRODUCE AN OPERATING SYSTEM DECK. HE MAY ALSO WRITE MACRO STATEMENTS AND INCLUDE SUBROUTINES IN THE LIBRARY. A MORE DETAILED DESCRIPTION OF THIS PROGRAM IS CONTAINED IN THE AUTOCODER BULLETIN LISTED IN THE REFERENCES. THE SOURCE SYMBOLIC PROGRAM IS SET UP IN A PRESCRIBED MANNER AND IS OPERATED ON BY THE AUTOCODER TO PRODUCE AN OPERATING SYSTEM DECK.

THE MINIMUM MACHINE CONFIGURATION REQUIRED BY THIS AUTOCODER PROCESSOR IS:

1. 40K STORAGE, OVERLAP AND PRIORITY
  2. 50 CYLINDERS OF 1301 DISK STORAGE AS REQUIRED BY 1410/1301 PROCESSOR OPERATING SYSTEM, NO. 1410-PR-134.
  3. ONE IBM 1402 CARD READ-PUNCH\*
  4. ONE IBM 1403 PRINTER, MODEL 2\*
- \* OPTIONS ARE AVAILABLE TO TRADE 1 OR 2 OR 3 MAGNETIC TAPE UNITS FOR THE 1402 AND 1403 RECORD DEVICES.
1. PRELIMINARY REFERENCE MANUAL IBM 1410 PROCESSOR OPERATING SYSTEM, USING IBM 1301 DISK STORAGE.
  2. SAMPLE PROGRAM FOR AUTOCODER AND IOCS, INCLUDING A CARD PROGRAM DECK, LISTING AND INSTRUCTIONS.

## COBOL PROCESSOR 1410-CB-944

1410 COBOL PROCESSOR ACCEPTS PROGRAMS WRITTEN IN THE COBOL LANGUAGE AS INPUT AND PRODUCES COMPLETE OBJECT PROGRAMS TO PERFORM THE FUNCTIONS SPECIFIED IN THE SOURCE STATEMENTS. THE PROCESS INVOLVES A COBOL RUN /WHICH PRODUCES COBOL DIAGNOSTICS AND THE SOURCE PROGRAM TRANSLATED INTO AUTOCODER LANGUAGE AND FORMAT/ FOLLOWED BY AN AUTOCODER RUN /WHICH PRODUCES THE OBJECT PROGRAM ASSEMBLY LISTING AND A CONDENSED DECK/. THE PROCESS IS CONTINUOUS AND COMPLETE IF- 1. NO SERIOUS DIAGNOSTIC ERRORS ARE DISCOVERED, AND 2. IF THE SYSTEM CONFIGURATION PROVIDES TAPE INPUT TO THE AUTOCODER PROCESSOR.

THE MINIMUM MACHINE CONFIGURATION REQUIRED BY THE COBOL PROCESSOR IS- 1. 40K STORAGE 2. PROCESSING OVERLAP AND PRIORITY SPECIAL FEATURES 3. TWO IBM 729 II, 729 IV, 729 V OR 7330 MAGNETIC TAPE UNITS. USERS WHO DO NOT HAVE TAPE UNITS CAN SUBSTITUTE AN IBM 1402 CARD READ-PUNCH, MODEL 2, AND A 1403 PRINTER, MODEL 2, FOR THESE TWO TAPE UNITS.

THE LISTING TAPES FOR SUBJECT SYSTEMS ARE THE STANDARD OUTPUT TAPES PRODUCED BY 1410 AUTOCODER AS DESCRIBED IN THE OPERATORS GUIDE FOR SYSTEM SUPERVISOR AND AUTOCODER. THEY CONTAIN THE SELF-LOADING 1401 PROGRAM WHICH PRINTS AND PUNCHES THE CONTENTS OF THE TAPE. THE OPERATING PROCEDURE FOR THIS PROGRAM IS IN THE SYSTEM SUPERVISOR OPERATORS GUIDE. WHILE THE TAPE WILL NORMALLY BE USED TO PRODUCE PRINTED LISTINGS, THEY MAY ALSO BE USED TO OBTAIN SYMBOLIC DECKS.

## FORTRAN /FORMULA TRANSLATING/ II PROCESSOR 1410-FO-945

THE 1410 FORTRAN /FORMULA TRANSLATING/ II PROCESSOR IS A 1410 MACHINE LANGUAGE PROGRAM. THIS PROGRAM CONVERTS A SOURCE PROGRAM WRITTEN IN THE FORTRAN II LANGUAGE /WHICH CLOSELY RESEMBLES THE LANGUAGE OF MATHEMATICS/ INTO AN OBJECT PROGRAM READY TO RUN ON THE IBM 1410. THE FORTRAN PROCESSOR THUS MAKES IT POSSIBLE FOR PERSONNEL TRAINED IN MATHEMATICS BUT NOT IN PROGRAMMING TO PREPARE PROBLEMS FOR THE COMPUTER.

THE PROCESSOR IS USED IN TWO PHASES, A FORTRAN PHASE AND AN AUTOCODER PHASE. DURING THE FORTRAN PHASE, THE PROCESSOR COMPILES A SYMBOLIC PROGRAM IN AUTOCODER FORMAT. DURING THE AUTOCODER PHASE, THE PROCESSOR CONVERTS THIS AUTOCODER PROGRAM INTO A 1410 OBJECT PROGRAM.

THE MINIMUM MACHINE CONFIGURATION REQUIRED BY THE FORTRAN II PROCESSOR IS SPECIFIED IN THE REFERENCE MANUAL C28-0287, IBM 1410 PROCESSOR OPERATING SYSTEM USING IBM 1301 DISK STORAGE.

THE USER OF 1410 FORTRAN, 1410-FO-945, MUST OBTAIN A COPY OF THE 1410 FORTRAN SUBROUTINE LIBRARY, 1410-FO-138. THIS SUBROUTINE LIBRARY INCLUDES THE RELOCATION LOADER AND SUBROUTINES NECESSARY FOR EXECUTING FORTRAN OBJECT PROGRAMS.

THE LISTING TAPES FOR SUBJECT SYSTEMS ARE THE STANDARD OUTPUT TAPES PRODUCED BY 1410 AUTOCODER AS DESCRIBED IN THE OPERATORS GUIDE FOR SYSTEM SUPERVISOR AND AUTOCODER. THEY CONTAIN THE SELF-LOADING 1401 PROGRAM WHICH PRINTS AND PUNCHES THE CONTENTS OF THE TAPE. THE OPERATING PROCEDURE FOR THIS PROGRAM IS IN THE SYSTEM SUPERVISOR OPERATORS GUIDE. WHILE THE TAPE WILL NORMALLY BE USED TO PRODUCE PRINTED LISTINGS, THEY MAY ALSO BE USED TO OBTAIN SYMBOLIC AND CONDENSED DECKS.

## INPUT/OUTPUT CONTROL SYSTEM 1410-IO-926

1410-IO-926 1410 IOCS. THE IBM 1410 INPUT/OUTPUT CONTROL SYSTEM IS A SET OF PRE-WRITTEN ROUTINES THAT WILL PERFORM ALL INPUT/OUTPUT FUNCTIONS FOR AN OBJECT PROGRAM. AMONG THESE FUNCTIONS ARE SCHEDULING OF READ AND WRITE OPERATIONS, ERROR DETECTION AND CORRECTION, END-OF-FILE HANDLING, AND BLOCKING AND DEBLOCKING OF RECORDS. SUCH FUNCTIONS NORMALLY REQUIRE APPROXIMATELY 40 PER CENT OF THE INSTRUCTIONS IN AN AVERAGE PROGRAM. THE IOCS IS CONTAINED IN THE LIBRARY OF THE PROCESSOR OPERATING SYSTEM.

THE 1410 IOCS INCLUDES MACRO-INSTRUCTIONS AND ROUTINES WHICH PROVIDE PROGRAMMING SUPPORT FOR-

1. UNIT RECORD EQUIPMENT
2. MAGNETIC TAPE UNITS
3. 1405 DISK STORAGE
4. 1301 DISK STORAGE
5. 1414 I/O SYNCHRONIZER, MODELS 4 & 5

THE IOCS NOW INCLUDES AN INDEPENDENT ASSEMBLY FEATURE WHICH ENABLES USERS OF THE 1410 IOCS TO ASSEMBLE SEPARATELY OBJECT PROGRAMS AND AN IOCS THAT WILL SERVE THESE PROGRAMS.

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A PARTICULAR ADVANTAGE OF THE FEATURE IS THE SIGNIFICANT REDUCTION OF TIME REQUIRED FOR REASSEMBLY WORK. WHEN THIS FEATURE IS USED, MODIFICATIONS TO OBJECT PROGRAMS DO NOT NECESSITATE REASSEMBLY OF THE OBJECT PROGRAMS, NOR DO CHANGES TO AN IOCS NECESSITATE REASSEMBLY OF THE OBJECT PROGRAM WHICH IT SERVES.

FEATURES PROVIDED IN SUPPORT OF THE 1414 I/O SYNCHRONIZER, MODELS 4 & 5, INCLUDE ROUTINES TO OPEN AND CLOSE INPUT AND OUTPUT AREAS FOR THE RECEIPT AND TRANSMISSION OF DATA, READ AND WRITE INFORMATION FROM AND TO THE 1414 I/O AND FROM CORE STORAGE, SAVE AND RESTORE CPU STATUS WHEN INTERRUPTED, CONTROL TRANSFER TO THE APPROPRIATE REAL-TIME ROUTINE, AND DETECT ERRORS AND WHEN POSSIBLE CORRECT ERRORS. THE ROUTINES IN SUPPORT OF 1301 AND 1405 DISK STORAGE AND THE 1414 I/O SYNCHRONIZER, MODELS 4 & 5, REQUIRE THE PROCESSING OVERLAP AND PRIORITY SPECIAL FEATURES. AFTER THE PROGRAMMER DEFINES HIS PARTICULAR MACHINE CONFIGURATION BY MEANS OF DIOCS AND DTF STATEMENTS, HE CAN USE THE IOCS MACRO-INSTRUCTIONS TO GENERATE, THROUGH THE AUTOCODER PROCESSOR, APPROPRIATE BLOCKING, DEBLOCKING, AND SCHEDULING ROUTINES. LABELLING ROUTINES, AND, WHERE APPLICABLE, CHECKPOINT ROUTINES CAN ALSO BE USED. THE INDEPENDENT ASSEMBLY FEATURE IS INCLUDED THROUGH THE DIOCS ENTRY OPTIONS.

THE 1410 IOCS HAS THE FOLLOWING MINIMUM MACHINE REQUIREMENTS-- 20,000 POSITIONS OF CORE STORAGE  
 1 IBM 1405 DISK STORAGE /REQUIRED ONLY FOR A 1405 IOCS/  
 1 IBM 1301 DISK STORAGE /REQUIRED ONLY FOR A 1301 IOCS/  
 ONE OR MORE TELECOMMUNICATION DEVICES ATTACHED TO A 1414 INPUT/OUTPUT SYNCHRONIZER, MODEL 4 OR 5 /REQUIRED ONLY FOR A 1414 IOCS/  
 PROCESSING OVERLAP AND PRIORITY SPECIAL FEATURES /REQUIRED ONLY FOR 1405, 1301, OR 1414 IOCS/  
 UNIT RECORD DEVICES /AND/ OR MAGNETIC TAPE UNITS ARE SUPPORTED BY CARD/TAPE FEATURES IN ANY CONFIGURATION.  
 1. CARD DECK - RESTART PROGRAM IOCS  
 2. OPERATORS GUIDE

## REPORT PROGRAM GENERATOR 1410-RG-943

1410-RG-943 1410/1301 REPORT PROGRAM GENERATOR. THE 1410 RPG ACCEPTS REPORT SPECIFICATIONS AND PRODUCES A SYMBOLIC PROGRAM DECK /AUTOCODER FORMAT/ FOR THE DESIRED REPORT-WRITING PROGRAM. THE GENERATED REPORT-WRITING PROGRAM CAN PRODUCE REPORTS IN A WIDE RANGE OF FORMATS, EXTRACTING ITS DATA FROM A CARD, TAPE, OR DISK FILE /ONE ONLY/ AND PERFORMING CALCULATIONS AT ANY POINT IN THE REPORTING PROCESS. RPG-GENERATED PROGRAMS UTILIZE 1410 IOCS.

THE CONTROL CARDS AND THE REPORT-SPECIFICATIONS CARDS ARE PLACED IN PARALLEL ORDER. THE PROGRAM OPERATING SYSTEM, NO. 1410-PR-134, IS USED IN AN RPG RUN. AN AUTOCODER RUN WILL FOLLOW AUTOMATICALLY TO PRODUCE THE PROGRAM DECK FOR THE REPORT-WRITING PROGRAM. THE OUTPUT OF THE GENERATED PROGRAM CAN BE A PRINTED REPORT AND/OR PUNCHED CARDS OR TAPE IN THE MOVE MODE, EVEN PARITY.

MINIMUM REQUIREMENTS ARE--

- 40K STORAGE OVERLAP AND PRIORITY
  - 50 CYLINDERS OF 1301 DISK STORAGE AS REQUIRED BY 1410/1301 PROCESSOR OPERATING SYSTEM, NO. 1410-PR-134.
  - ONE IBM 1402 CARD READ-PUNCH\*
  - ONE IBM 1403 PRINTER, MODEL 2\*
  - OPTIONS ARE AVAILABLE TO TRADE 1 OR 2 OR 3 MAGNETIC TAPE UNITS FOR THE 1402 AND 1404 UNIT RECORD DEVICE.
1. SAMPLE PROBLEM FOR RPG. THIS INCLUDES A CARD PROGRAM DECK, LISTING, AND INSTRUCTIONS.  
 2. PRELIMINARY REFERENCE MANUAL FOR IBM 1410 PROCESSOR OPERATING SYSTEM, USING IBM 1301 DISK STORAGE.

## SYSTEMS SUPERVISOR 1410-SV-941

1410-SV-941 SYSTEM CONTROL. THE PURPOSE OF SYSTEM CONTROL IS TO PROVIDE SUPPORT FOR THE PROCESSORS IN THE PROCESSOR OPERATING SYSTEM. IN THIS CAPACITY IT CONTROLS JOB SEQUENCING, ANALYSIS OF CONTROL INFORMATION, INPUT/OUTPUT OPERATIONS, AND MAINTENANCE OF THE SYSTEM ITSELF. UPDATING THE SYSTEM LIBRARY TAPE, LOADING THE SYSTEM LIBRARY TAPE ONTO THE 1301, AND PRINTING SPECIFIED PARTS OF THE SYSTEM/. THE SYSTEM CONTROL CONSISTS OF EIGHT PROGRAMS, CONTAINED ON THE SYSTEM. SOME ARE CALLED VIA CONTROL CARDS OR CONTROL INFORMATION SUPPLIED BY THE OPERATOR AND OTHERS ARE CALLED BY OTHER PROGRAMS IN THE PROCESSOR OPERATING SYSTEM.

THE MINIMUM MACHINE CONFIGURATION REQUIRED BY SYSTEM CONTROL FOR SYSTEM MAINTENANCE RUNS AND PROCESSOR RUNS IS--

- 40K STORAGE
  - OVERLAP AND PRIORITY
  - TWO IBM 729 II, IV, V, VI OR 7330 MAGNETIC TAPE UNITS
  - ONE IBM 1402 CARD READ-PUNCH
  - 50 CYLINDERS OF IBM 1301 DISK STORAGE
- \* ONE OF THESE TAPE UNITS CAN BE REPLACED BY ONE IBM 1403 PRINTER FOR A LIBRARY PRINT RUN.  
 \*\* THIS ITEM MAY BE REPLACED BY AN ADDITIONAL IBM 729II, IV, V, OR 7330 MAGNETIC TAPE UNIT.

1. 1410/1301 PROCESSOR OPERATING SYSTEM REFERENCE MANUAL. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
 DOCUMENTATION - PROGRAM WRITE-UP...LISTINGS...FLOWCHARTS... OPERATING INSTRUCTIONS.  
 CARD DECKS - CONDENSED PROGRAM DECK...SAMPLE PROBLEM DECK... IOCS RESTART DECK.  
 ONE MAGNETIC TAPE - PROCESSOR OPERATING SYSTEM TAPE.

OPTIONAL PROGRAM MATERIAL -  
 EIGHT MAGNETIC TAPES - 1410-AU-942 ASSEMBLY LISTING, /ONE TAPE/...1410-CB-944 ASSEMBLY LISTING, /TWO TAPES/...1410-F0-945 ASSEMBLY LISTINGS, /THREE TAPES/...1410-SV-941 ASSEMBLY LISTINGS, /ONE TAPE/...1410-RG-943 ASSEMBLY LISTINGS, /ONE TAPE/.

1410-PR-155  
TAPE

1410/7010 OPERATING SYSTEMS

\*M

ORDER THROUGH LOCAL IBM BRANCH OFFICE  
 SPECIFY FILE NUMBER 1410-PR-155

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USERS OF 1410 AND 7010 SYSTEMS CAN NOW MORE FULLY REALIZE THE CAPABILITIES OF THEIR MACHINES. THE 1410/7010 OPERATING SYSTEM IS A FLEXIBLE PACKAGE OF CONTROL PROGRAMS AND PROCESSING PROGRAMS, DESIGNED TO PROVIDE CUSTOMERS WITH PROGRAMMED CONTROL OF OPERATING PROCEDURES AND WITH FULLY TESTED PROGRAMS THAT SATISFY SUCH BASIC NEEDS AS SORTING AND COMPILING. THE COMPILERS INCLUDED IN THIS MODULAR SYSTEM ARE NEW PROGRAMS--THEY ARE NOTABLY FASTER THAN PREVIOUS VERSIONS OF THESE COMPILERS. USE OF THE OPERATING SYSTEM NOT ONLY MINIMIZES THE NEED FOR MANUAL CONTROL OF THE MACHINE, BUT ALSO REDUCES THE TIME REQUIRED FOR BOTH THE WRITING AND EXECUTION OF PROGRAMS. UNDER CONTROL OF THE SYSTEM MONITOR, AN INSTALLATIONS DAILY WORK LOAD CAN BE BATCHED AND CONTINUOUSLY FED INTO THE SYSTEM. THE BATCH OF WORK CAN INCLUDE ANY NUMBER AND MIXTURE OF JOB TYPES-- PRODUCTION RUNS /PAYROLL, INVENTORY, BILLING/- COMPILATIONS- UTILITY OPERATIONS /STORAGE PRINTS, TAPE PRINTS/- SORTING AND MERGING- PROGRAM TESTING.

THE OPERATING SYSTEM PROVIDES SUPPORT FOR A TELE-PROCESSING SYSTEM. ALL PROGRAMS WITHIN THE OPERATING SYSTEM HAVE BEEN WRITTEN TO OPERATE WITHIN THIS TYPE OF PROCESSING ENVIRONMENT. THE 7770 AUDIO RESPONSE UNIT CAN BE USED AS A TELE-PROCESSING DEVICE. THE 7770 HAS THE CAPABILITY OF SENDING VOCAL RESPONSES TO THE PERSON MAKING AN INQUIRY. THE TELE-PROCESSING SUPERVISOR SYSTEM CAN OPERATE UNDER THE CONTROL OF THE OPERATING SYSTEM TO ANSWER INQUIRIES FROM A 7770. ERROR CHECKING OCCURS ON BOTH INPUT AND OUTPUT. THE ANSWER IS TO THE ORIGINATING 7770. IN ADDITION, THE TELE-PROCESSING SUPERVISOR CAN BE INCORPORATED INTO THE SYSTEM MONITOR, PROVIDING INPUT/OUTPUT CONTROL FOR TELE-PROCESSING DEVICES AND SUPERVISING THE LOADING AND EXECUTION OF PROGRAMS TO HANDLE THAT INPUT/OUTPUT. THE ENTIRE SYSTEM CAN OPERATE EITHER TO TAPE OR TO DISK STORAGE, OR THE USER CAN WORK WITH A COMBINATION OF THE TWO MEDIA--SUCH AS A DISK-ORIENTED MONITOR CONTROLLING COMPILERS THAT USE TAPE FOR WORK FILES.  
 ADDITIONAL FEATURES--  
 -1302 DISK FORMAT/ADDRESS GENERATOR  
 -FILE SAVE PROGRAM, RESTORES DATA TO 1301 OR 1302 DISK STORAGE.  
 -DISK PRINT PROGRAM, PRINTS THE CONTENTS OF 1301 OR 1302 DISK.  
 -DATA FILE GENERATOR, GENERATES DATA FILES ON MAGNETIC TAPE, 1301 OR 1302 DISK STORAGE.

OPTIONAL PROGRAM MATERIAL CONSISTS OF 2 TAPES

TAPE 1	NO. OF CHARTS
SYSTEM MONITOR	1410-SV-962 45
RESIDENT AND TRANSITIONAL MONITORS	1410-UT-963 36
LINKAGE LOADER	1410-SV-964 48
TELE-PROCESSING SUPERVISOR	1410-MI-965 47
SYSTEM GENERATION PROGRAMS	1410-IO-966 21
BASIC INPUT/OUTPUT CONTROL SYSTEM	1410-IO-967 3
RANDOM-PROCESSING SCHEDULER	1410-CB-969 17
COBOL PROCESSOR	NO. OF CHARTS
TAPE 2	
AUTOCODER PROCESSOR	1410-AU-968 49
FORTRAN PROCESSOR	1410-F0-970 138
GENERALIZED TAPE SORTING PROGRAM	1410-SM-971 34
UTILITY PROGRAMS	1410-UT-973 19
GENERALIZED SORT USING DISK	NO CHARTS AVAILABLE.

THE MINIMUM MACHINE REQUIREMENTS FOR AN ATTACHED 1015 INQUIRY DISPLAY TERMINAL SYSTEM-- 6145 1410/7010... FIVE MAG. TAPE UNITS...ONE CARD READER...ONE PRINT UNIT...ONE MAG. TAPE UNIT FOR THE TELE-PROCESSING LIBRARY FILE. NOTE-- ONE ADDITIONAL TAPE UNIT MAY BE USED IN PLACE OF THE CARD READER, AND ONE ADDITIONAL TAPE UNIT MAY BE USED IN PLACE OF THE PRINTER. FOR A DISK ORIENTED SYSTEM-- 80K 1410/7010...TWO MAG. TAPE UNITS, FOR SYSTEM GENERATION, ...ONE CARD READER...ONE PRINT UNIT...ONE MAGNETIC TAPE UNIT FOR THE TELE-PROCESSING LIBRARY FILE. NOTE-- WHEN DISK AREA FOR THE TELE-PROCESSING LIBRARY FILE. NOTE-- WHEN SYSTEM GENERATION IS NOT BEING PERFORMED, ONE OF THE TWO TAPE UNITS REQUIRED FOR SYSTEM GENERATION MAY BE USED IN PLACE OF THE CARD READER, AND ONE OF THE TWO TAPE UNITS MAY BE USED IN PLACE OF THE PRINTER.

MINIMUM MACHINE REQUIREMENTS FOR AN ATTACHED 7770 MODEL 2- TAPE SYSTEM-- 60K 1410/7010...FIVE MAGNETIC TAPE UNITS...ONE CARD READER OR AN ADDITIONAL TAPE UNIT...ONE PRINT UNIT OR AN ADDITIONAL TAPE UNIT...AND ONE MAGNETIC TAPE UNIT FOR THE TELE-PROCESSING LIBRARY FILE. A DISK ORIENTED SYSTEM REQUIRES-- AN 80K 1410/7010...TWO MAGNETIC TAPE UNITS FOR SYSTEM GENERATION...ONE CARD READER...ONE PRINT UNIT...ONE MODULE OF 1301 OR 2302 DISK STORAGE...AND ONE MAGNETIC TAPE UNIT OR DISK AREA FOR THE TELE-PROCESSING LIBRARY FILE. NOTE-- WHEN SYSTEM GENERATION IS NOT BEING PERFORMED, ONE OF THE TWO TAPE UNITS REQUIRED FOR GENERATION MAY BE USED IN PLACE OF THE CARD READER, AND ONE OF TWO TAPE UNITS IN PLACE OF THE PRINT UNIT.

THE FILE ORGANIZATION SYSTEM FOR 1301/2302 DISK STORAGE DOES NOT HAVE FLOW CHARTS THE FILE NO. IS 1410-MI-977.  
 THE IBM 1015 INQUIRY DISPLAY TERMINAL MAY BE USED WITH THE 1410 OR 7010 UNDER THE OPERATING SYSTEM. THE PROGRAMMING SUPPORT CONSISTS OF TWO MODULES, ONE FOR EACH CHANNEL. THE APPROPRIATE MODULE, LIKE MODULES FOR OTHER TELE-PROCESSING DEVICES, IS INCORPORATED INTO THE TELE-PROCESSING SUPERVISOR BY THE USER AT SYSTEM GENERATION. THE 1015 PROVIDES VISUAL DISPLAY OF INFORMATION FROM A CENTRAL FILE STORAGE, ALLOWING THE USER IMMEDIATE ACCESS TO UP-TO-DATE RECORDS FOR CUSTOMER INQUIRY AND MANY OTHER APPLICATIONS WHERE NO HARD COPY IS REQUIRED. THE TERMINAL CONSISTS OF A KEYBOARD BY WHICH THE USER ENTERS INQUIRIES INTO THE COMPUTER AND A CATHODE-RAY TUBE DISPLAY UNIT ON WHICH THE RESPONSE APPEARS. AS WITH OTHER TELE-PROCESSING DEVICES, THE TELE-PROCESSING SUPERVISOR CAN INTERRUPT BATCH PROGRAMS BEING PROCESSED UNDER THE OPERATING SYSTEM TO SERVICE AN INQUIRY FROM THE 1015 TERMINAL. AFTER USER-WRITTEN ROUTINES ANALYZE THE INQUIRY AND COMPOSE A RESPONSE, THE SUPERVISOR CAUSES THE RESPONSE TO BE TRANSMITTED TO THE 1015 THAT ORIGINATED THE INQUIRY. ERROR CHECKING OCCURS ON BOTH INPUT AND OUTPUT.  
 OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH.

BASIC PROGRAM MATERIAL -  
 DOCUMENTATION - PROGRAM WRITE-UP... SAMPLE PROBLEM... LISTINGS. TWO MAGNETIC TAPES - /ONE TAPE/ SYSTEM TAPE - TAPE ORIENTED SYSTEM... /ONE TAPE/ SYSTEMS TAPE - DISK ORIENTED SYSTEM.

OPTIONAL PROGRAM MATERIAL -  
 THREE MAGNETIC TAPES - /ONE TAPE/ - HISTORY FILE... /TWO TAPES/ - AUTOCHARTS... LISTINGS.

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<p>1410-SE-01X 1410/7010 OPERATING SYSTEM CONVERSION PROGRAM *M            ORDER THROUGH LOCAL IBM BRANCH OFFICE            SPECIFY FILE NUMBER 1410-SE-01X            OS THE 1410/7010 OPERATING SYSTEM CONVERSION PROGRAM ACCEPTS AS INPUT USERS PROGRAMS WRITTEN IN 1410 AUTOCODER - IOCS. IT AUTOMATICALLY CONVERTS ALL POSSIBLE STATEMENTS TO THE LANGUAGE OF THE 1410/7010 OPERATING SYSTEM AND FLAGS ALL THOSE STATEMENTS ABOUT WHICH IT HAS INSUFFICIENT INFORMATION TO PERFORM THE NECESSARY CONVERSION. IT IS AN EFFECTIVE CONVERSION TOOL FOR BOTH TAPE AND DISK SYSTEMS AND HAS BEEN FIELD TESTED WITH EXCELLENT RESULTS.            FEATURES            - EFFICIENT CONVERSION OF TAPE AND DISK PROGRAMS.            - REDUCED CONVERSION TIME AND COST            - PERMITS FULL UTILIZATION OF ALL OPERATING SYSTEM ADVANTAGES-- FASTER SORTS, MORE EFFICIENT COMPILERS, MODULAR PROGRAMMING, MONITORED OPERATION.            - OPERATES ON ANY SYSTEM WITH OPERATING SYSTEM CAPACITY.            - MODULAR AND EASILY MODIFIED.            USE-- THE USERS AUTOCODER-- IOCS SOURCE STATEMENTS ARE READ INTO THE SYSTEM BY THE CONVERSION PROGRAM. THE PROGRAM MAKES THE NECESSARY CHANGES TO THE SOURCE DECK, PLACING THE NEW SOURCE CARDS ON A WORK TAPE. THE TAPE IS REWOUND, AND THE CONVERTED DECK PUNCHED. AT THE SAME TIME A LISTING IS PRINTED WHICH CONTAINS BOTH THE OLD /DELETED/ AUTOCODER - IOCS STATEMENTS AND THE NEW /INSERTED/ OPERATING SYSTEM COMPATIBLE STATEMENTS. THE PUNCHED DECK OMTS THE /DELETED/ STATEMENTS. STATEMENTS WHICH MAY REQUIRE SPECIAL DECISIONS ARE FLAGGED TO BE /CHECKED/ AND ARE PUNCHED EXCEPT FOR THOSE /CHECKED/ STATEMENTS ON WHICH ACTION MUST BE TAKEN. THE NEW SOURCE DECK IS READY FOR AN AUTOCODER ASSEMBLY UNDER THE 1410/7010 OPERATING SYSTEM.            MINIMUM SYSTEM REQUIREMENTS-- A 40 K 1410 SYSTEM WITH ONE CHANNEL, OVERLAP AND PRIORITY, A 1402 CARD READ PUNCH, A 1403 PRINTER, AND ONE TAPE UNIT. THE 1402 CARD READ PUNCH AND/OR 1403 PRINTER MAY BE REPLACED BY MAGNETIC TAPE UNITS.            THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM *M            REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MU* I BE ITEMIZED ON THE ORDER CARD. *</p>	<p>CONTINUED FROM PRIOR COLUMN-- MODEL 2.            THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. *            BASIC PROGRAM MATERIAL -            DOCUMENTATION - PROGRAM WRITEUP ... OPERATING INSTRUCTIONS            CARD DECK - CONDENSED PROGRAM DECK. *            OPTIONAL PROGRAM MATERIAL -            ONE 2400 FOOT MAG. TAPE CONTAINING THE ASSEMBLY LISTINGS. *</p>
<p>BASIC PROGRAM MATERIAL -            DOCUMENTATION - PROGRAM WRITE-UP... REFERENCE MANUAL.            CARD DECKS - SAMPLE PROBLEM DECK.            MAGNETIC TAPES - ONE REEL CONTAINING THE OUTPUT OF A PR-108 ASSEMBLY RUN INCLUDING SOURCE AND OBJECT PROGRAM AND PROGRAM LISTINGS.</p>	<p>1410-SM-137 GENERALIZED SORTING PROGRAM *M            USING IBM 1301 DISK STORAGE            ORDER THROUGH LOCAL IBM BRANCH OFFICE            SPECIFY FILE NUMBER 1410-SM-137            THE IBM 1410 SORTING PROGRAM USING IBM 1301 DISK STORAGE WILL SORT FIXED-LENGTH OR VARIABLE-LENGTH DATA RECORDS, SINGLE OR BLOCKED. THE PROGRAM IS CONSIDERED A GENERALIZED SORT BECAUSE IT IS CAPABLE OF MODIFYING ITSELF ACCORDING TO THE SPECIFICATIONS DETAILED ON ITS CONTROL CARDS.            THE PROGRAM REQUIRES AN IBM 1410 WITH 40K, 60K, OR 80K CORE STORAGE, THE PROCESSING OVERLAP AND PRIORITY SPECIAL FEATURES, AND ONE OR TWO MODULES OF 1301 DISK STORAGE. AT LEAST ONE TAPE UNIT AND TWO MODULES OF 1301 DISK STORAGE ARE REQUIRED TO ACHIEVE OPTIMUM EFFICIENCY. HOWEVER, THE PROGRAM WILL RUN WITHOUT TAPE UNITS AND WITH ONE DISK STORAGE MODULE.            BASIC PROGRAM MATERIAL--            1. A PROGRAM DECK FOR LOADER 2 /DSL02/            2. A PROGRAM DECK FOR RESTART /DSRST/            3. A REFERENCE MANUAL            4. A SAMPLE PROBLEM INPUT TAPE AND THREE CONTROL CARDS            5. A DESCRIPTION OF THE SAMPLE PROBLEM            6. FLOW CHARTS FOR THE IBM 1410 GENERALIZED SORTING PROGRAM USING IBM 1301 DISK STORAGE            7. A CARD DECK CONTAINING THREE MODIFICATION CARDS WHICH ARE REQUIRED FOR 1410 SYSTEMS THAT DO NOT HAVE TWO-CHANNEL CAPABILITY.            THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM *M            REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MU* T BE ITEMIZED ON THE ORDER CARD. *</p>
<p>1410-SI-101 SIMULATION OF THE 650 WITH *M            THE 1410            ORDER THROUGH LOCAL IBM BRANCH OFFICE            SPECIFY FILE NUMBER 1410-SI-101            PURPOSE THE 650 SIMULATION PROVIDES MEANS TO RUN 650 PROGRAMS ON A PRODUCTION BASIS. IF THE USER REQUIRES A MORE DETAILED DESCRIPTION ON THE PROGRAM, HE MAY OBTAIN IT BY REQUESTING THE SIMULATION OF IBM 650 ON IBM 1410 BULLETIN. MACHINE CONFIGURATION 1. MINIMUM OF 40,000 CORE LOCATIONS. 2. ONE 1402 READER-PUNCH.            THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM *M            REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES* PROVIDED MUST BE 2400 FEET IN LENGTH. *</p>	<p>BASIC PROGRAM MATERIAL -            DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.            ONE MAGNETIC TAPE - SYSTEM TAPE /INCLUDES ASSEMBLY LISTINGS &amp; CONDENSED CARDS. *M</p>
<p>BASIC PROGRAM MATERIAL -            DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.            ONE MAGNETIC TAPE - SYSTEM TAPE /INCLUDES ASSEMBLY LISTINGS &amp; CONDENSED CARDS. *</p>	<p>1410-UT-106 INDIVIDUAL UTILITY PROGRAM *M            ORDER THROUGH LOCAL IBM BRANCH OFFICE            SPECIFY FILE NUMBER 1410-UT-106            UPOS CONTROL PROGRAM. THIS PROGRAM RESIDES IN STORAGE DURING AN ENTIRE 1410 DATA PROCESSING SYSTEM. IT CONTROLS THE OPERATION OF AND LINKAGES TO THE UTILITY AND OBJECT PROGRAMS BY MEANS OF CONTROL CARDS AS SET UP IN THE CONTROL DECK UNIT BY THE OPERATOR FOR THE TOTAL SYSTEM RUN.            THE IBM 1410 UTILITY PROGRAM OPERATING SYSTEM /UPOS/ OFFERS A FLEXIBLE MEANS OF USING THE UTILITY PROGRAMS PROVIDED FOR THE IBM 1410 DATA PROCESSING SYSTEM, AND SAVES MACHINE TIME BY ELIMINATING EXCESSIVE CARDS AND TAPE HANDLING. THE NUMBER OF CONSOLE MANIPULATIONS IS ALSO REDUCED, THEREBY REDUCING THE POSSIBILITY OF ERRORS. EACH OF THE PROGRAMS CAN BE USED IN CONJUNCTION WITH UPOS OR THEY CAN BE LOADED INDIVIDUALLY THROUGH THE CARD READER /OR CARD READER TAPE/.</p>
<p>1410-SM-111 SORT/MERGE 11 *M            ORDER THROUGH LOCAL IBM BRANCH OFFICE            SPECIFY FILE NUMBER 1410-SM-111            PURPOSE SORT-MERGE 11 IS A GENERALIZED UN-BUFFERED TAPE SORTING AND MERGING PROGRAM DESIGNED TO PERMIT EITHER THE SORTING OR THE MERGING OF DATA SO AS TO PRODUCE ORDERED OUTPUT DATA. INPUT RECORDS CAN BE FIXED OR VARIABLE LENGTH, SINGLE OR BLOCKED. OUTPUT CAN BE EITHER IN ASCENDING OR DESCENDING ORDER. ANY ORDER OF MERGE UP TO 5-WAY MAY BE EMPLOYED. USE A MINIMUM OF TWO CONTROL CARDS MUST BE PREPARED BY THE USER MACHINE CONFIGURATION A* 20,000 POSITIONS OF CORE STORAGE B* 4 IBM 729 II, 729 IV, AND/OR 730 MAGNETIC TAPE UNITS /MAY BE INTER-MIXED/ IF SORT/MERGE 11 IS TO PERFORM AS A SORT. /TO PERFORM A 2-WAY MERGE ONLY THREE TAPES ARE NEEDED./ C* IBM 1402 CARD READ-PUNCH MODEL 2. IF STORAGE SIZE IS 40K, 60K OR 80K, SORT/MERGE 11 WILL USE THE ADDITIONAL STORAGE, WHEN NECESSARY, TO INCREASE THE SIZE OF ITS INPUT/OUTPUT AREAS AND WORK AREAS.            THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM *M            REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. *</p>	<p>THE MINIMUM MACHINE REQUIREMENTS FOR UPOS ARE AS FOLLOWS-- CORE-STORAGE POSITIONS 0000-00500, EXCLUSIVE OF THE INDEX REGISTER LOCATIONS AND PRIORITY ROUTINE LOCATIONS /THE TOTAL NUMBER OF CORE-STORAGE POSITIONS REQUIRED DEPENDS ON THE INDIVIDUAL UTILITY PROGRAMS/.            1. IBM 1402 CARD READ-PUNCH, MODEL 2 /A MAGNETIC TAPE UNIT -IBM 1402 CARD READ-PUNCH, MODEL 2, V, V1, OR 730-CAN BE SUBSTITUTED/.            2. THE TAPE FILE GENERATOR A. THIS PROGRAM PREPARES FIXED-LENGTH, UNBLOCKED RECORDS FROM CARDS OR CARD IMAGE RECORDS ON TAPE.            3. THE TAPE FILE GENERATOR B. THIS PROGRAM, FORMERLY KNOWN AS CIT, PREPARES FIXED-LENGTH, BLOCKED RECORDS FROM CARDS OR CARD IMAGE RECORDS ON TAPE.            4. THE STORAGE PRINT PROGRAM. THIS PROGRAM PRINTS OUT THE CONTENTS OF CORE STORAGE.            5. THE TAPE PRINT PROGRAM. THIS PROGRAM PRINTS A LISTING OF THE DATA CONTAINED ON ANY MAGNETIC TAPE WRITTEN BY AN IBM 1410.            6. THE SNAPSHOT PROGRAM. THIS PROGRAM PRINTS OUT THE CONTENTS OF A SELECTED AREA OF CORE STORAGE FOLLOWING THE EXECUTION OF A SPECIFIED INSTRUCTION IN THE OBJECT PROGRAM.            7. THE BRANCH TRACE PROGRAM. THIS PROGRAM TRACES EACH BRANCH INSTRUCTION IN A 1410 PROGRAM BY PRINTING A LIST OF THE EXECUTED BRANCH INSTRUCTIONS.            8. THE TRACE PROGRAM. THIS PROGRAM TRACES EACH INSTRUCTION WITHIN A SPECIFIED AREA OF A 1410 PROGRAM BY PRINTING A LIST OF THE INSTRUCTIONS /WITH ASSOCIATED DATA/ THAT ARE EXECUTED.            9. THE TAPE COMPARE PROGRAM. THIS PROGRAM COMPARES THE CONTENTS OF TWO TAPE FILES AND LISTS THE RECORDS AND RECORD NUMBERS OF THE RECORDS THAT ARE NOT IDENTICAL.            10. THE TAPE DUPLICATE PROGRAM. THIS PROGRAM COPIES RECORDS FROM ONE TAPE ONTO ANOTHER TAPE.            11. THE STORAGE PUNCH PROGRAM. THIS PROGRAM PUNCHES THE CONTENTS OF A SELECTED AREA OF CORE STORAGE INTO CARDS.            NOTE-- ANY OF THE ABOVE PROGRAMS REQUIRING A 1403 PRINTER MAY BE ALTERED WITH A CONTROL CARD TO WRITE THE PRINTED OUTPUT ON A SUBSTITUTE PRINTER TAPE, /SUBPRINTER/. THESE ARE THE PROGRAMS WHICH OPERATE UNDER THE UPOS CONTROL PROGRAM. THE FOLLOWING PROGRAMS ARE DISTRIBUTED BY IBM AT THE END OF THE UPOS PROGRAM DECK.            12. THE STANDARD 1410 LOAD PROGRAM. THIS PROGRAM LOADS UP TO 60 CHARACTERS CONTAINED ON A LOAD CARD INTO</p>
<p>BASIC PROGRAM MATERIAL -            DOCUMENTATION - PROGRAM WRITEUP ... OPERATING INSTRUCTIONS.            CARD DECK - CONDENSED PROGRAM DECK. *</p> <p>OPTIONAL PROGRAM MATERIAL -            ONE 2400 FOOT MAG. TAPE CONTAINING THE ASSEMBLY LISTINGS. *</p>	<p>1410-SM-112 SORT/MERGE 12 *M            ORDER THROUGH LOCAL IBM BRANCH OFFICE            SPECIFY FILE NUMBER 1410-SM-112            PURPOSE SORT - MERGE 12 IS A GENERALIZED TAPE SORTING AND MERGING PROGRAM WHICH EMPLOYS THE PROCESSING OVERLAP AND PRIORITY SPECIAL FEATURES. IT IS DESIGNED TO PERMIT EITHER THE SORTING OR THE MERGING OF DATA SO AS TO PRODUCE ORDERED OUTPUT DATA. INPUT RECORDS CAN BE FIXED OR VARIABLE LENGTH, SINGLE OR BLOCKED. OUTPUT CAN BE EITHER IN ASCENDING OR DESCENDING ORDER. ANY ORDER OF MERGE UP TO 5-WAY MAY BE EMPLOYED. USE A MINIMUM OF TWO CONTROL CARDS MUST BE PREPARED BY THE USER MACHINE CONFIGURATION A* 20,000 POSITIONS OF CORE STORAGE B* PROCESSING OVERLAP AND PRIORITY SPECIAL FEATURES C* 4 IBM 729 II, 729 IV, AND/OR 730 MAGNETIC TAPE UNITS /MAY BE INTER-MIXED/ IF SORT/MERGE 12 IS TO FUNCTION AS A SORT. /TO PERFORM A 2-WAY MERGE, ONLY THREE TAPES ARE NEEDED./ D* IBM 1402 CARD READ-PUNCH</p>

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SEQUENTIAL CORE STORAGE LOCATIONS. THIS IS A 9 CARD PROGRAM. THE LAST TWO CARDS ARE AS FOLLOWS--

A. CLEAR STORAGE--THIS CARD CLEARS ALL STORAGE ABOVE LOCATION 00499 TO BLANKS.

B. SET INDEXES -- THIS CARD CLEARS ALL INDEX REGISTERS TO BLANKS AND SETS WORD MARKS AT THE HIGH ORDER POSITION OF EACH.

13. THE WRITE--TAPE--MARK--AND--REWIND--PROGRAM. THIS PROGRAM CAUSES A TAPE MARK TO BE WRITTEN AT THE CURRENT POSITION OF A SPECIFIED TAPE AND ALSO CAUSES THE TAPE TO BE REWOUND. THIS IS A ONE CARD PROGRAM, HOWEVER, TWO CARDS ARE DISTRIBUTED BY IBM-- THE ONE CARD PROGRAM FOR CHANNEL ONE TAPE, AND THE ONE CARD PROGRAM FOR CHANNEL TWO TAPE.

ALL OF THE INDIVIDUAL UTILITY PROGRAMS REQUIRE THE FOLLOWING MINIMUM REQUIREMENTS-- 10,000 POSITIONS OF CORE STORAGE, 1 IBM 1402 CARD READ--PUNCH, MODEL 2 OR 1 IBM 729 II, 729 IV, OR 7330 MAGNETIC TAPE UNIT. PROGRAMS PRODUCING PRINTED OUTPUT ALSO REQUIRE-- 1 IBM 1403 PRINTER, MODEL 2 OR 1 IBM 729 II, 729 IV, OR 7330 MAGNETIC TAPE UNIT. IN ADDITION, PROGRAMS USING MAGNETIC TAPES ALSO REQUIRE-- 1 OR 2 IBM 729 II, 729 IV, OR 7330 MAGNETIC TAPE UNITS, DEPENDING ON THE PROGRAM. NOTE-- TAPE DRIVES MAY BE INTERMIXED. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*M

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. \*

BASIC PROGRAM MATERIAL -- DOCUMENTATION -- PROGRAM WRITE-UP... OPERATING INSTRUCTIONS... FLOWCHARTS... LISTINGS. CARD DECK -- CONDENSED PROGRAM DECK.

OPTIONAL PROGRAM MATERIAL -- ONE MAGNETIC TAPE -- /ASSEMBLY LISTINGS/. CARD DECK -- SYMBOLIC DECK FOR CARD SYSTEMS ONLY.

1410-UT-126 1301 DISK STORAGE UTILITY \*M

PROGRAMS ORDER THROUGH LOCAL IBM BRANCH OFFICE SPECIFY FILE NUMBER 1410-UT-126

FORMAT TRACK GENERATION PROGRAM. THIS PROGRAM WRITES ONE OR MORE FORMAT TRACKS ACCORDING TO THE SPECIFICATIONS OF THE USER.

HOME ADDRESS AND RECORD ADDRESS GENERATION PROGRAM. THIS PROGRAM WRITES HOME ADDRESS IDENTIFIERS AND RECORD ADDRESSES ON ONE OR MORE TRACKS IN ACCORDANCE WITH THE USER'S SPECIFICATIONS. IT IS ALWAYS LOADED INTO STORAGE WITH THE FORMAT TRACK GENERATION PROGRAM. IT MUST BE EXECUTED AFTER THE FORMAT TRACKS HAVE BEEN WRITTEN.

LOAD DISK PROGRAM. THIS PROGRAM LOADS INFORMATION FROM MAGNETIC TAPE INTO SPECIFIED AREAS OF CORE STORAGE.

DUMP DISK PROGRAM. THIS PROGRAM WRITES INFORMATION FROM ONE OR MORE TRACKS OF DISK STORAGE ONTO MAGNETIC TAPE.

RESTORE DISK PROGRAM. THIS PROGRAM RELOADS INTO DISK STORAGE INFORMATION THAT WAS WRITTEN ONTO MAGNETIC TAPE BY THE DUMP DISK PROGRAM.

CLEAR DISK PROGRAM. THIS PROGRAM CLEARS SELECTED AREAS OF DISK STORAGE AND FILLS THOSE AREAS WITH BLANKS OR ANY OTHER 1410 CHARACTER SPECIFIED BY THE USER.

MACHINE CONFIGURATION-- ALL 1301 DISK STORAGE UTILITY PROGRAMS REQUIRE THE FOLLOWING MINIMUM MACHINE CONFIGURATION-- 20,000 POSITIONS OF CORE STORAGE, PROCESSING OVERLAP SPECIAL FEATURE, 1301 DISK STORAGE UNIT /MODEL 1 OR 2/, 1 IBM 1402 CARD READ--PUNCH, MODEL 2 /A MAGNETIC TAPE UNIT MAY BE SUBSTITUTED/. THE LOAD DISK, DUMP DISK, AND RESTORE DISK PROGRAMS ALSO REQUIRE-- 1 IBM 729 /MODEL II, IV, V, OR VI/ OR 7330 MAGNETIC TAPE UNIT.

THE ABOVE UTILITY PROGRAMS ARE SUPPLIED IN CARD-DECK FORM, ORGANIZED SO THAT A UTILITY PROGRAM OPERATING SYSTEM TAPE MAY BE CREATED BY A SIMPLE CARD TO TAPE OPERATION.

THE IBM 1410 UTILITY PROGRAM OPERATING SYSTEM OFFERS A FLEXIBLE MEANS OF USING THE UTILITY PROGRAMS PROVIDED FOR THE IBM 1410 DATA PROCESSING SYSTEM, AND SAVES MACHINE TIME BY ELIMINATING EXCESSIVE CARD AND TAPE HANDLING. THE NUMBER OF CONSOLE MANIPULATIONS ARE ALSO REDUCED, THEREBY REDUCING THE POSSIBILITY OF ERRORS. EACH OF THE PROGRAMS CAN BE USED IN CONJUNCTION WITH UPDS OR THEY CAN BE LOADED INDIVIDUALLY THROUGH THE CARD READER, OR CARD READER TAPE.

THE MINIMUM MACHINE REQUIREMENTS FOR UPDS ARE AS FOLLOWS-- CORE-STORAGE POSITIONS 00000-00500, EXCLUSIVE OF THE INDEX REGISTER LOCATIONS AND PRIORITY ROUTINE LOCATIONS /THE TOTAL NUMBER OF CORE-STORAGE POSITIONS REQUIRED DEPENDS ON THE INDIVIDUAL UTILITY PROGRAMS/. 1 IBM 1402 CARD READ--PUNCH, MODEL 2 /A MAGNETIC TAPE UNIT--IBM 729 II, IV, V, VI, OR 7330--CAN BE SUBSTITUTED/. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*M

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. \*

BASIC PROGRAM MATERIAL -- DOCUMENTATION -- PROGRAM WRITE-UP... OPERATING INSTRUCTIONS... FLOWCHARTS... LISTINGS. CARD DECKS -- CONDENSED PROGRAM DECK.

OPTIONAL PROGRAM MATERIAL -- ONE MAGNETIC TAPE -- /ASSEMBLY LISTINGS/.

1410-UT-147 MULTIPLE UTILITY PROGRAM \*M

ORDER THROUGH LOCAL IBM BRANCH OFFICE SPECIFY FILE NUMBER 1410-UT-147

THE MULTIPLE UTILITY PROGRAM PROVIDES THE FOLLOWING OPERATIONS-- 1. CARD--TO--TAPE OPERATION, 1 TAPE--TO--CARD OPERATION, 2. TAPE--TO--PRINTER OPERATIONS. ANY COMBINATION OF THESE OPERATIONS MAY BE RUN CONCURRENTLY. THE MULTIPLE UTILITY PROGRAMS ARE CONTROLLED BY PARAMETERS ENTERED IN CONTROL CARDS, CONSOLE ALTERATION, OR BY CONSOLE INQUIRY. THE PROGRAMMER CAN ACTIVATE MODIFICATION EXITS AND INCORPORATE HIS OWN ROUTINES BY INSERTING THE PROPER

CONTINUED FROM PRIOR COLUMN--

CARDS BETWEEN THE LAST AND THE NEXT TO THE LAST CARDS OF THE MULTIPLE UTILITY PROGRAM DECK. THE FOLLOWING MINIMUM MACHINE REQUIREMENTS MUST BE MET TO USE THIS PROGRAM-- 20,000 POSITIONS OF CORE STORAGE, PROCESSING OVERLAP SPECIAL FEATURE, ONE IBM 1402 CARD READ--PUNCH, MODEL 2, ONE IBM MAGNETIC TAPE UNIT FOR EACH OPERATION TO BE EXECUTED CONCURRENTLY. THESE MAY BE 729 MODEL II, IV, V, OR VI OR 7330 MAGNETIC TAPE UNITS. THE TYPES OF UNITS MAY BE INTERMIXED. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*M

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\* PROVIDED MUST BE 2400 FEET IN LENGTH. \*

BASIC PROGRAM MATERIAL -- DOCUMENTATION -- PROGRAM WRITE-UP... LISTINGS... FLOWCHARTS... OPERATING INSTRUCTIONS. CARD DECKS -- CONDENSED PROGRAM DECK /ALSO HAS SAMPLE PROBLEM/. ONE MAGNETIC TAPE -- /ASSEMBLY LISTINGS/.

## 7070

7070-AD-151 7070/7074 AUTOCHART \*M

ORDER THROUGH LOCAL IBM BRANCH OFFICE SPECIFY FILE NUMBER 7070-AD-151

AUTOCHART IS A SYSTEM WHICH USES COMPUTERS TO PRODUCE, MAINTAIN, CONTROL, AND DISTRIBUTE PROGRAM FLOWCHARTS AND OTHER TYPES OF TABULAR OR GRAPHIC INFORMATION. THE AUTOCHART USER CODES HIS FLOWCHARTS ON AUTOCHART CODING SHEETS IN A MANNER WHICH IS MACHINE INDEPENDENT. THESE CODING SHEETS ARE THEN KEY PUNCHED AND PROCESSED BY THE 7070/7074 TO PRODUCE FLOWCHARTS WHICH ARE PRINTED OFF-LINE. AN UPDATING RUN WILL ALLOW THE USER TO QUICKLY MODIFY THE FLOWCHARTS, AFTER PROVIDING ONLY THE CHANGES. EACH CHART MAY HAVE UP TO 50 BLOCKS, AND A FILE MAY CONTAIN UP TO 250 CHARTS. ADVANTAGES--EASE OF SPECIFYING THE CHARTS...EASE OF KEEPING THE CHARTS UP TO DATE...PRESENTABILITY OF THE CHARTS... UNIFORMITY OF LAYOUT AND SYMBOLS...EASE OF PREPARING THE CHARTS FOR PERMANENT DOCUMENTATION OF PUBLICATION...RELEASE OF PROGRAMMER FROM CLERICAL DUTIES. FEATURES

SYMBOLS THAT CONFORM TO THE PROPOSED ASA X3.6/12 STANDARD ON FLOWCHART SYMBOLS FOR INFORMATION PROCESSING. SYMBOLS ARE PROVIDED FOR BOTH ON-PAGE AND OFF-PAGE CONNECTORS POSITIONS OF BLOCKS IN THE CHART CAN BE SPECIFIED AS DESIRED FLOWLINES ARE DEFINED BY SPECIFYING TERMINAL POINTS OF THE LINE ROUTING OF LINES IS AUTOMATIC-- IF LINES CANNOT BE DRAWN, CONNECTORS ARE GENERATED. BLOCKS CAN BE ALTERED, INSERTED, AND MOVED, AND THE TEXT IN THE BLOCKS CAN BE CHANGED. CROSS REFERENCES BETWEEN CHARTS IN THE SAME FILE ARE UPDATED AUTOMATICALLY WHEN THE CHARTS ARE CHANGED. NONFLOWCHART FIGURES SUCH AS MEMORY MAPS AND DECISION CAN BE MADE BY USING ONLY LINE AND COMMENTS CARDS

MINIMUM MACHINE REQUIREMENTS-- A 10K 7070 OR 7074 SYSTEM WITH... TWO CHANNELS WITH SIX 729 MAGNETIC TAPE UNITS...A 1401 SYSTEM WITH 1403 PRINTER MODEL 2 /AND ANY STANDARD UTILITY PRINT PROGRAM THAT ACCEPTS BLOCKED RECORDS/. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*M

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\* PROVIDED MUST BE 2400 FEET IN LENGTH. \*

BASIC PROGRAM MATERIAL -- DOCUMENTATION -- PROGRAM WRITE-UP... SAMPLE PROBLEM LISTING... OPERATING INSTRUCTIONS. CARD DECK -- SAMPLE PROBLEM DECK. ONE MAGNETIC TAPE -- CONTAINING -- SYSTEM IN CARD IMAGE FORMAT... PROGRAM LISTING... SOURCE PROGRAM IN CARD IMAGE FORMAT.

7070-AT-082 PAT -- PROCEDURE FOR

AUTOMATIC TESTING ORDER THROUGH LOCAL IBM BRANCH OFFICE SPECIFY FILE NUMBER 7070-AT-082

PURPOSE THE PAT SYSTEM HAS BEEN DESIGNED TO STANDARDIZE TESTING PROCEDURES SO THAT THEY MAY BE JUST AS EFFICIENT IN A CUSTOMER INSTALLATION AS THEY ARE IN A 7070 DATA CENTER WITH NO CHANGE IN TEST PROCEDURES. THE TESTING OF A PROGRAM BY THE PAT SYSTEM IS ACCOMPLISHED IN THREE PHASES. THE FIRST PHASE IS THE CREATION OF THE DATA FILES BY THE TAPE FILE GENERATOR PROGRAM. THE SECOND PHASE IS THE PROCESSING OF THE OBJECT PROGRAM. THE THIRD IS THE RECORDING OF THE RESULTS OF THE TEST THROUGH THE USE OF STORAGE PRINT AND TAPE PRINT PROGRAMS. PAT TESTING ENABLES THE PROCESSING OF UNDEBUGGED PROGRAMS BY REMOTE TESTING YET UNDER PROGRAMMER CONTROL. THE RESULTS INCLUDING THE OUTPUT FROM THE UTILITY PROGRAMS WOULD BE RETURNED TO THE PROGRAMMER FOR DESK DEBUGGING. THE PAT SYSTEM PROVIDES FOR THE TESTING OF PROGRAMS BY CARD OR TAPE PROCESSING.

BASIC PROGRAM MATERIAL -- DOCUMENTATION -- PROGRAM WRITE-UP... OPERATING INSTRUCTIONS. CARD DECK -- CONDENSED PROGRAM DECK.

7070-AU-072 BASIC AUTOCODER \*M

ORDER THROUGH LOCAL IBM BRANCH OFFICE SPECIFY FILE NUMBER 7070-AU-072

THE 7070 BASIC AUTOCODER IS A SYMBOLIC PROGRAMMING SYSTEM DESIGNED TO SIMPLIFY THE PREPARATION OF PROGRAMS FOR THE 7070 DATA PROCESSING SYSTEM. WITH THE INCREASED CAPACITY AND VERSATILITY OF DATA PROCESSING SYSTEMS, MACHINE-LANGUAGE INSTRUCTIONS HAVE INCREASED CORRESPONDINGLY IN BOTH NUMBER AND COMPLEXITY. CODING IN MACHINE LANGUAGE TODAY IS AN EXTREMELY TEDIOUS AND TIME-CONSUMING TASK. THE 7070 BASIC AUTOCODER IS A SYMBOLIC PROGRAMMING SYSTEM DESIGNED TO PERMIT THE PROGRAMMER TO CODE MORE EASILY AND WITH GREATER MEANING THAN IS POSSIBLE WITH NUMERICAL MACHINE LANGUAGE. SYMBOLIC PROGRAMMING SYSTEMS ALSO PERFORM AUTOMATICALLY MANY BURDENSOME TASKS SUCH AS ASSIGNING AND KEEPING TRACK OF STORAGE LOCATIONS AND CHECKING FOR ERRORS. USE OF THESE SYSTEMS WILL SAVE THE PROGRAMMER A SIGNIFICANT AMOUNT OF VALUABLE PROGRAMMING TIME AND EFFORT. THE 7070 BASIC AUTOCODER IS DESIGNED SPECIFICALLY FOR USE IN 7070 DATA PROCESSING INSTALLATIONS WHICH CONTAIN UNIT-RECORD INPUT/ OUTPUT EQUIPMENT ONLY, OR A MAXIMUM OF ONE OR TWO TAPE

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 UNITS. THIS VERSION INCLUDES THE ADDITION OF THE EXECUTE CONTROL STATEMENT, THE ABILITY TO MIX CONDENSED CARD OUTPUT ON THE LISTING TAPE, THE ASSIGNMENT OF RELOCATION INDICATOR AND THE TYPING OF THE VERSION AND LEVEL OF THE BASIC AUTOCODER PROCESSOR BEING USED.  
 THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
 DOCUMENTATION - OPERATING INSTRUCTIONS... PROGRAM WRITE-UP.  
 CARD DECK - CONDENSED PROGRAM DECK.

OPTIONAL PROGRAM MATERIAL -  
 ONE MAGNETIC TAPE - SOURCE LANGUAGE FILE.

7070-AU-074 AUTOCODER 74 \*M  
 ORDER THROUGH LOCAL IBM BRANCH OFFICE  
 SPECIFY FILE NUMBER 7070-AU-074

PURPOSE AUTOCODER 74 IS A SYMBOLIC PROGRAMMING SYSTEM DESIGNED TO SIMPLIFY THE PREPARATION OF PROGRAMS FOR THE 7070 DATA PROCESSING SYSTEM. WITH THE INCREASED CAPACITY AND VERSATILITY OF DATA PROCESSING SYSTEMS, MACHINE-LANGUAGE INSTRUCTIONS HAVE INCREASED CORRESPONDINGLY IN BOTH NUMBER AND COMPLEXITY. CODING IN MACHINE LANGUAGE TODAY IS AN EXTREMELY TEDIOUS AND TIME-CONSUMING TASK. THE 7070 AUTOCODER 74 IS A SYMBOLIC PROGRAMMING SYSTEM DESIGNED TO PERMIT THE PROGRAMMER TO CODE MORE EASILY AND WITH GREATER MEANING THAN IS POSSIBLE WITH NUMERICAL MACHINE LANGUAGE. SYMBOLIC PROGRAMMING SYSTEMS ALSO PERFORM AUTOMATICALLY MANY BURDENSOME TASKS SUCH AS ASSIGNING AND KEEPING TRACK OF STORAGE LOCATIONS AND CHECKING FOR ERRORS. USE OF THESE SYSTEMS WILL SAVE THE PROGRAMMER A SIGNIFICANT AMOUNT OF VALUABLE PROGRAMMING TIME AND EFFORT. AUTOCODER 74 ALLOWS THE USE OF IOCS MACRO-INSTRUCTIONS. MACHINE REQUIREMENTS 4 TAPE UNITS.  
 THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
 DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.  
 ONE MAGNETIC TAPE - AUTOCODER 74 SYSTEM.

OPTIONAL PROGRAM MATERIAL -  
 ONE MAGNETIC TAPE - ASSEMBLY LISTINGS.

7070-FO-073 BASIC FORTRAN \*M  
 ORDER THROUGH LOCAL IBM BRANCH OFFICE  
 SPECIFY FILE NUMBER 7070-FO-073

PURPOSE THE IBM FORMULA TRANSLATING SYSTEM, FORTRAN, IS AN AUTOMATIC CODING SYSTEM WHICH CONSISTS OF A SOURCE-LANGUAGE /CLOSELY RELATED ORDINARY LANGUAGE OF MACHINE CODES/, AND A PROCESSOR WHICH CONVERTS SOURCE PROGRAMS WRITTEN IN THE FORTRAN LANGUAGE INTO MACHINE-LANGUAGE OBJECT PROGRAMS. MACHINE CONFIGURATION 5,000 WORDS OF CORE STORAGE, IBM 7500 CARD READER /UTILITY PANEL/, IBM 7500 CARD PUNCH /UTILITY PANEL/.  
 THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
 DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS... LISTINGS.  
 CARD DECK - CONDENSED PROGRAM DECK.

OPTIONAL PROGRAM MATERIAL -  
 TWO MAGNETIC TAPES - /ONE TAPE/-SOURCE LANGUAGE FILE...  
 /ONE TAPE/- ASSEMBLY LISTINGS.

7070-FO-116 FORTRAN LOADER FOR THE \*M  
 7070/72/74  
 ORDER THROUGH LOCAL IBM BRANCH OFFICE  
 SPECIFY FILE NUMBER 7070-FO-116

PURPOSE THE 7070/2/4 FORTRAN LOADER PROVIDES USERS OF 7070/2/4 FORTRAN AND USERS OF 7070/2/4 BASIC FORTRAN WITH THE PRINCIPLE OF RELOCATABILITY TO INSURE THAT SEVERAL ROUTINES CAN BE COMPILED SEPARATELY BUT USED TOGETHER AT OBJECT TIME. USE OF PROGRAM THE 7070/2/4 FORTRAN LOADER HAS BEEN DESIGNED SPECIFICALLY TO LOAD THE FORTRAN OBJECT PROGRAM, THE 7070/2/4 FORTRAN PACKAGE, AND THE USERS COMPILED SUBPROGRAMS, AND SUBROUTINES /WRITTEN IN THE FORTRAN OR AUTOCODER LANGUAGE/ TO PRODUCE A RELOCATED PROGRAM /WITHIN STORAGE OR ON SOME OUTPUT MEDIUM/ AVAILABLE FOR OBJECT TIME PROCESSING. THE PROGRAM IS ADAPTABLE TO EACH USERS REQUIREMENTS BY CHANGING THE CONTROL INFORMATION IN THE LOADER. THE 7070/2/4 FORTRAN LOADER RELOCATES ITSELF INTO UPPER CORE STORAGE AS SPECIFIED BY THE USER. THE LOADER ZEROS ITSELF OUT ONCE ALL PROGRAMS REQUIRED FOR A PARTICULAR OBJECT RUN HAVE BEEN RELOCATED. CAPABILITIES AND LIMITATIONS FORTRAN OBJECT PROGRAMS WHICH ARE OF SUCH SIZE THAT THEY OVERLAY THE LOADER BUT WHICH DO NOT EXCEED CORE STORAGE CAPACITY, AS DEFINED BY THE USER, MAY BE EXECUTED BY WRITING OUT THE RELOCATED PROGRAM ON SOME OUTPUT MEDIUM. THIS IS DONE THROUGH THE USE OF AN ALTERATION SWITCH. THE RELOCATED PROGRAM SHOULD BE READ BACK INTO CORE STORAGE WITH THE IBM 7070/2/4 CONDENSED CARD LOAD PROGRAM WHICH, TOGETHER WITH A ZERO STORAGE PROGRAM, IS WRITTEN OUT PRECEDING THE RELOCATED PROGRAM. STORAGE IS ZEROED UP TO THE POINT INDICATED BY THE USER IN THE LOADER OPTION. THIS OPTION IS AVAILABLE TO ANY PROGRAM-REGARDLESS OF SIZE, BUT NOT EXCEEDING CORE STORAGE CAPACITY. PROGRAMS WHICH EXCEED CORE STORAGE CAPACITY ARE NOT EXECUTABLE AND MUST BE REWRITTEN. UNDER CONTROL OF ANOTHER ALTERATION SWITCH, THE USER HAS THE OPTION TO TYPE OUT A MAP SHOWING THE LOCATIONS OF PROGRAMS AND THEIR DATA AREAS.  
 THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

CONTINUED FROM PRIOR COLUMN--

BASIC PROGRAM MATERIAL -  
 DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS  
 CARD DECK - PROGRAM DECK

OPTIONAL PROGRAM MATERIAL -  
 TWO MAGNETIC TAPES - /ONE TAPE/- ASSEMBLY LISTING...  
 /ONE TAPE/- SOURCE LANGUAGE FILES.

7070-FO-125 FORTRAN LIBRARY FOR \*M  
 7070/72/74  
 ORDER THROUGH LOCAL IBM BRANCH OFFICE  
 SPECIFY FILE NUMBER 7070-FO-125

THE 7070/2/4 FORTRAN LIBRARY CONSISTS OF A GROUP OF PRECODED FUNCTION SUBROUTINES PROVIDING THE USERS OF 7070/2/4 BASIC FORTRAN AND 7070/2/4 FORTRAN WITH ABSOLUTE RELOCATABLE OBJECT PROGRAMS TO SUPPLEMENT THE FEATURES OF THE FORTRAN LANGUAGE PRESENTLY AVAILABLE. THESE FUNCTION SUBROUTINES MAY BE CLASSIFIED AS FOLLOWS- 1. TRIGONOMETRIC FUNCTIONS PERFORMING THE OPERATIONS SINE, COSINE, ARCSINE, ARCTANGENT AND HYPERBOLIC TANGENT. 2. BASIC MATHEMATICAL FUNCTIONS EXECUTING THE TASKS OF SQUARE ROOT, CHOOSING LARGEST /MINIMUM/ VALUE, CHOOSING SMALLEST /MINIMUM/ VALUE, TRANSFER OF SIGN, POSITIVE DIFFERENCE, REMAINDERING AND TRUNCATION. 3. ERROR ROUTINE STANDARDIZING ERROR REPORTING PROCEDURES FOR THE ABOVE FUNCTIONS.

THE 7070/2/4 FORTRAN LIBRARY IS UTILIZED AS PART OF THE FORTRAN OBJECT PROGRAM, TOGETHER WITH THE 7070/2/4 FORTRAN PACKAGE, THE USERS MAIN PROGRAM, COMPILED SUBPROGRAMS, AND SUBROUTINES /WRITTEN IN THE FORTRAN OR AUTOCODER LANGUAGE/. THE 7070/2/4 FORTRAN LOADER/PACKAGE LOADS, RELOCATES AND EXECUTES THE FORTRAN OBJECT PROGRAMS.

THE 7070/2/4 FORTRAN LIBRARY MAY BE UTILIZED WITH ANY OF THE FOLLOWING CONFIGURATIONS- A/ IBM 7070, IBM 7072 OR IBM 7074. B/ CARD ORIENTED, CARD/TAPE OR TAPE ORIENTED SYSTEM C/ 5K OR 10K MAGNETIC CORE STORAGE D/ THE FLOATING POINT ARITHMETIC DEVICE IS OPTIONAL.

AFTER BEING LOADED BY THE 7070/2/4 FORTRAN LOADER, THE 7070/2/4 FORTRAN LIBRARY SUBROUTINES APPEAR IN RELOCATED FORM IN CORE STORAGE. THE USERS COMPILED MAIN PROGRAM WILL CONTAIN A BRANCH LIST SPECIFYING THE REQUIRED LIBRARY SUBROUTINES. IF THE BRANCH LIST IS PRESENT IN THE MAIN PROGRAM, LINKING THE DIFFERENT ROUTINES IN A PROGRAM, IS FILLED IN WITH BRANCH INSTRUCTIONS BY THE FORTRAN LOADER AS IT PLACES THE VARIOUS SUBROUTINES IN STORAGE. ALSO, THE LIBRARY SUBROUTINES ARE THEMSELVES EQUIPPED WITH THE PROPER BRANCH LISTS, TITLE CARDS AND TRANSFER ENTRY CARDS AS REQUIRED BY THE FORTRAN LOADER.

THE 7070/2/4 FORTRAN LIBRARY IS CONSIDERED PART OF THE FORTRAN OBJECT PROGRAM AND, AS SUCH, IS DEPENDENT UPON SOME OF THE ROUTINES OF THE 7070/2/4 FORTRAN PACKAGE. SPECIFICALLY, THE ROUTINES ARE-EXPONENTIATION OF E /EXPFF/, THE FLOATING POINT SIMULATION ROUTINES, FLOATING POINT TO FIXED POINT CONVERSION AND FIXED POINT TO FLOATING POINT CONVERSION.

SOME OF THE FORTRAN LIBRARY SUBROUTINES INCORPORATE THEIR OWN ERROR ANALYSIS. THE ROUTINE ERRTYPE EXISTS TO PROVIDE A COMMON ERROR PROCEDURE PRODUCING SIMILAR MESSAGES AND TABULATED HALTS.

THE 7070/2/4 FORTRAN LIBRARY SUPPLEMENTS THE FEATURES OF THE FORTRAN LANGUAGE PRESENTLY AVAILABLE ON THE 7070/2/4 FORTRAN AND THE 7070/2/4 BASIC FORTRAN PROCESSORS. THE LIBRARY FURTHER IMPLEMENTS THE COMPATIBILITY BETWEEN 7070/2/4 FORTRAN LANGUAGE AND THE FORTRAN LANGUAGE OF ANY HIGHER-SCALE IBM MACHINE.

WHEREVER POSSIBLE, THE CONVENTIONS FOR WRITING LIBRARY FUNCTION SUBROUTINES HAVE BEEN ADHERED TO. THE FOLLOWING PRACTICES ARE OBSERVED THROUGHOUT- 1. THE MACHINE IS ASSUMED TO BE IN THE SENSE MODE FOR THE FIELD OVERFLOW AND SIGN CHANGE LATCHES. THE LIBRARY SUBROUTINES DO NOT DESTROY THESE CONDITIONS. 2. PRIORITY MASKS AND HIGH-LOW-EQUAL COMPARE INDICATORS MAY BE USED FREELY. CONTROL IS NEVER RETURNED TO THE COMPILED FORTRAN PROGRAM IN THE PRIORITY MODE. 3. ALTERATION SWITCHES ARE NOT USED. ELECTRONIC SWITCHES AND INDEX WORDS 1 THROUGH 92 ARE NOT USED UNLESS THEIR CONTENTS ARE SAVED AND THEN RESTORED. ACCUMULATORS ARE USED AS REQUIRED, BUT ACCUMULATOR OVERFLOW, FLOATING-DECIMAL OVERFLOW, AND FLOATING-DECIMAL UNDERFLOW CONDITIONS ARE NOT ALTERED. 4. TRANSFERS TO AND FROM LIBRARY FUNCTION SUBROUTINES ARE CARRIED OUT USING INDEX WORD 94. TRANSFERS TO AND FROM THE 7070/2/4 FORTRAN PACKAGE ARE CARRIED OUT USING INDEX WORD 93. 5. IN PROGRAMS COMPILED BY 7070/2/4 FORTRAN AND 7070/2/4 BASIC FORTRAN, ACCUMULATOR 1 IS USED FOR FLOATING POINT ARITHMETIC AND ACCUMULATOR 2 IS USED FOR FIXED POINT ARITHMETIC. IN SINGLE-ARGUMENT LIBRARY FUNCTION SUBROUTINES, THE ARGUMENT, DEPENDING UPON ITS MODE, SHOULD BE FOUND IN THE PROPER ACCUMULATOR. IN MULTIPLE-ARGUMENT SUBROUTINES, THE ARGUMENTS SHOULD BE FOUND AT THE ADDRESSES 0/X94, 1/X94, ETC. THE RESULTS OBTAINED FROM EITHER TYPE OF SUBROUTINE SHOULD BE PLACED IN THE PROPER ACCUMULATOR DEPENDING UPON THE MODE OF THE FUNCTION.

THE AUTOCODER COMPILATION LISTING OF THE 7070/2/4 FORTRAN LIBRARY WILL REFLECT TWO WARNING MESSAGES WHICH SHOULD BE DISREGARDED.  
 THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
 DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS...  
 FLOWCHARTS... LISTINGS.  
 CARD DECK - CONDENSED PROGRAM DECK.

OPTIONAL PROGRAM MATERIAL -  
 TWO MAGNETIC TAPES - /ONE TAPE/, SOURCE LANGUAGE FILE...  
 /ONE TAPE/, ASSEMBLY LISTINGS.

7070-FO-149 FORTRAN LOADER-PACKAGE /7340 \*M  
 CAPABILITIES ADDED/, FOR THE 7070/72/74  
 ORDER THROUGH LOCAL IBM BRANCH OFFICE  
 SPECIFY FILE NUMBER 7070-FO-149

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THE 7070/2/4 FORTRAN LOADER/PACKAGE /7340 CAPABILITIES ADDED/ PROVIDES USERS OF 7070/2/4 FORTRAN AND USERS OF 7070/2/4 BASIC FORTRAN WITH THE PRINCIPLE OF RELOCATABILITY, TO INSURE THAT SEVERAL ROUTINES CAN BE COMPILED SEPARATELY BUT USED TOGETHER AT OBJECT TIME. ANY INPUT/OUTPUT TAPE PROCESSING CAN BE DONE ON 729 UNITS OR 7340 HYPERTAPE DRIVES IN ANY COMBINATION. A LIBRARY SEARCH FEATURE PROVIDES FOR THE LOADING OF REQUIRED LIBRARY ROUTINES. THIS PROGRAM ALSO CONSISTS OF A SET OF SUBROUTINES WHICH ARE CONSIDERED PART OF THE FORTRAN OBJECT PROGRAM. THESE SUBROUTINES MAY BE CLASSIFIED AS FOLLOWS-

1. INPUT/OUTPUT SUBROUTINES PROVIDE FOR THE READING OF DATA REQUIRED FOR PROCESSING AND THE WRITING OR PUNCHING OF RESULTS AS SPECIFIED. ANY I/O TAPE PROCESSING CAN BE DONE ON 729 UNITS OR 7340 HYPER-TAPE DRIVES IN ANY COMBINATION.
2. EXPONENTIATION SUBROUTINES PERFORM THE OPERATIONS REQUIRED TO RAISE NUMBERS TO A POWER. THREE TYPES ARE PERMISSIBLE IN AN ARITHMETIC STATEMENT, NOT INCLUDING A FIXED-POINT QUANTITY TO A FLOATING-POINT POWER.
3. FUNCTION SUBROUTINES TAKE THE LOGARITHM, TO THE BASE E OR IO OF A FLOATING-POINT ARGUMENT, PERFORM THE EXPONENTIATION OF E OR IO RAISED TO A FLOATING-POINT POWER, AND CONVERT NUMBERS FROM FIXED-POINT TO FLOATING-POINT FORM AND VICE VERSA.
4. FLOATING DECIMAL ARITHMETIC SUBROUTINES PERFORM THE FOUR FLOATING-POINT OPERATIONS ON MACHINES NOT EQUIPPED WITH THIS DEVICE.
5. ACCUMULATOR AND QUOTIENT OVERFLOW SUBROUTINE PERFORMS A TEST OF ALL RELEVANT OVERFLOW INDICATORS, TURNS THEM OFF, AND BRANCHES TO THE PROPER LOCATION.

THE 7070/2/4 FORTRAN LOADER/PACKAGE /7340 CAPABILITIES ADDED/ HAS BEEN DESIGNED SPECIFICALLY TO LOAD THE FORTRAN OBJECT PROGRAM TO PRODUCE A RELOCATED PROGRAM/WITHIN STORAGE OR ON SOME OUTPUT MEDIUM/ AVAILABLE FOR OBJECT-TIME PROCESSING. THE FORTRAN OBJECT PROGRAM INCLUDES THE PACKAGE SUBROUTINES, THE USER/S MAIN PROGRAM AND FUNCTIONAL PROGRAMS. THE FUNCTIONAL PROGRAMS ARE SUBROUTINE SUBPROGRAMS. THE FUNCTIONAL AND SUBROUTINE SUBPROGRAMS MAY BE COMPILED BY EITHER FORTRAN OR AUTOCODER. THE PACKAGE SUBROUTINES, WHICH ARE NOT RELOCATABLE, ARE LOADED BY THE LOADER PRIOR TO LOADING THE OBJECT PROGRAM. THE PROGRAM IS ADAPTABLE TO EACH USER/S REQUIREMENTS BY CHANGING THE CONTROL INFORMATION AS SPECIFIED IN PART 3 OF THE OPERATOR/S MANUAL IBM 7070 SERIES PROGRAMMING SYSTEMS - BASIC FORTRAN PROCESSOR, FORTRAN OBJECT PROGRAM, FORM C28-6334, AND THE SUPPLEMENT ATTACHED TO THE TRANSMITTAL LETTER. THE LOADER RELOCATES ITSELF INTO UPPER STORAGE AS SPECIFIED BY THE USER. THE LOADER ZEROS ITSELF OUT ONCE ALL PROGRAMS REQUIRED FOR A PARTICULAR OBJECT RUN HAVE BEEN RELOCATED. AFTER BEING LOADED BY THE LOADER, THE PACKAGE OCCUPIES LOWER STORAGE, BEGINNING WITH LOCATION 0425 AND CONTINUING FOR APPROXIMATELY 1400 LOCATIONS OF STORAGE. THE BRANCH LIST IN THE FORTRAN PACKAGE IS LOCATED IN LOCATIONS 0425-0458.

MACHINE REQUIREMENTS- THE 7070/2/4 FORTRAN LOADER/PACKAGE /7340 CAPABILITIES ADDED/, #7070-F0-149, REQUIRES AN IBM 7070, 7072 OR 7074 DATA PROCESSING SYSTEM WITH AT LEAST 5,000 WORDS OF CORE STORAGE. THE INPUT/OUTPUT EQUIPMENT REQUIRED DEPENDS UPON THE DATA PROCESSING SYSTEM TO BE USED. THE MINIMUM REQUIREMENTS FOR EACH SYSTEM IS AS FOLLOWS-

1. IF A 7070 IS USED, ONE 729 TAPE UNIT IS REQUIRED, OR THE SYSTEM MAY BE CARD ORIENTED.
2. IF A 7072 IS USED, ONE 7330 TAPE UNIT IS REQUIRED.
3. IF A 7074 IS USED, ONE 7340 OR ONE 729 TAPE UNIT IS REQUIRED, OR THE SYSTEM MAY BE CARD ORIENTED.

THE FOLLOWING OPTIONAL EQUIPMENT MAY BE INCLUDED IN THE SYSTEM IF DESIRED-

1. AN ADDITIONAL 5,000 WORDS OF CORE STORAGE MAY BE USED.
2. IF A 7070 OR 7074 IS USED, THE FLOATING-DECIMAL-POINT ARITHMETIC OPTIONAL FEATURE MAY BE ADDED.
3. TAPE UNITS AND/OR UNIT RECORD EQUIPMENT, WHICH ARE APPROPRIATE TO THE SYSTEM AS MENTIONED ABOVE, MAY BE ADDED AS DESIRED. NOTE THAT THE CONTROL UNIT OF A 7340 HYPERTAPE CONTROL UNIT AND ANY INPUT/OUTPUT ADAPTER DEVICE ON THE SAME CHANNEL IS NOT PERMITTED. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL - DOCUMENTATION - PROGRAM WRITE-UP... SAMPLE PROBLEM LISTING... OPERATING INSTRUCTIONS. CARD DECKS - CONDENSED PROGRAM DECK... SAMPLE PROBLEM DECK.

OPTIONAL PROGRAM MATERIAL - TWO MAGNETIC TAPES /ONE TAPE/, COMPILED LISTING... /ONE TAPE/, SOURCE LANGUAGE FILE.

7070-F0-159 FORTRAN OPERATING SYSTEM ORDER THROUGH LOCAL IBM BRANCH OFFICE SPECIFY FILE NUMBER 7070-F0-159

OUTSTANDING ADVANTAGES OF THIS NEW SYSTEM-

- COMPILING TIME IS AT LEAST 20 TIMES FASTER FOR MOST PROGRAMS COMPARED TO FULL FORTRAN.
- ABILITY TO COMPILE WITH IMMEDIATE EXECUTION.
- INTERMIXING OF COMPILE, COMPILE WITH EXECUTION, AND EXECUTE ONLY JOBS /WITH OR WITHOUT DATA/.
- A THOROUGH DIAGNOSTIC SCAN OF EACH SOURCE PROGRAM PRIOR TO COMPILED.
- A 1401 UTILITY PROGRAM FOR PERIPHERAL USE.

THE LANGUAGE IS COMPARABLE TO 7070 FULL FORTRAN- THE 7070 FORTRAN OPERATING SYSTEM PROVIDES MANY ADDITIONAL OPTIONS SUCH AS A SYMBOLIC DUMP ROUTINE AND A ROUTINE THAT ALLOWS PROGRAMS TO BE SUBDIVIDED, WITH EACH SECTION OVERLAYING THE PREVIOUS ONE. IT DOES NOT PROCESS TRIPLE SUBSCRIPTING, ARITHMETIC STATEMENT FUNCTIONS, VARIABLE NAMES MORE THAN FIVE CHARACTERS, EQUIVALENCE STATEMENTS WITHIN COMMON STATEMENTS, OR LITERAL INFORMATION IN THE ARGUMENT LIST OF A SUBROUTINE CALL STATEMENT.

OTHER CONVENIENCES- THE SYSTEM INCLUDES STORING OF THE USER/S FORTRAN PROGRAMS ON THE SYSTEM TAPE FOR ALTER EXECUTION AND THE LOADING AND EXECUTION OF OBJECT PROGRAMS FROM THE PERIPHERAL INPUT TAPE UNIT OR ANY OTHER TAPE UNIT. IT IS COMPLETELY SELF-CONTAINED. THE FORTRAN COMPILER, BASIC AUTOCODER COMPILER, FORTRAN LOADER/PACKAGE, SYSTEMS TAPE EDITOR, UTILITY PACKAGES, AND THE USER/S FORTRAN PROGRAMS ARE ALL ON ONE REEL OF TAPE.

MINIMUM SYSTEM REQUIREMENTS- ANY IOX 7070 SERIES WITH... SEVEN 729 OR 7330 MAGNETIC TAPE UNITS...TWO DATA TRANSMISSION CHANNELS... AND ONE 7501 CONSOLE CARD READER OR 7500 CARD READER... A 4K 1401 SYSTEM WITH ONE 729 II OR IV OR ONE 7330 MAGNETIC TAPE UNIT, HIGH-LOW-EQUAL COMPARE AND ADVANCE PROGRAMMING FEATURES. THAT IS ORDERED. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED

7070-CB-940 IBM 7070 SERIES COBOL/FORTRAN OPERATING SYSTEM COBOL COMPILER

THE IBM 7070 SERIES COBOL/FORTRAN OPERATING SYSTEM/COBOL COMPILER, COMPILES AND EXECUTES COBOL PROGRAMS FOR USE ON THE 7070 SERIES SYSTEMS. COMPILATION INCLUDES EXTENSIVE DIAGNOSTIC ERROR CHECKING. THE 7070 SERIES COBOL/FORTRAN OPERATING SYSTEM COBOL COMPILER IS A MODULAR COMPONENT OF THE FORTRAN OPERATING SYSTEM /FOS/ TAPE AND IS UNDER THE CONTROL OF THE FORTRAN LOAD AND GO /FLAG/ MONITOR.

THERE ARE LANGUAGE DIFFERENCES BETWEEN THIS COBOL AND THE CURRENT 7070 COBOL /7070-CB-923/. THESE DIFFERENCES EXIST BECAUSE THE NEW COBOL IS ORIENTED TOWARD INDUSTRY STANDARDIZATION.

FEATURES- COBOL SOURCE PROGRAMS ARE TRANSLATED DIRECTLY INTO OBJECT CODE, AND EXECUTION OF THE OBJECT PROGRAM CAN BE INITIATED WITHOUT INTERRUPTION. AN OPERATING SYSTEM ENVIRONMENT THAT INCLUDES MOST OF THE FAMILIAR FEATURES OF THE FORTRAN OPERATING SYSTEM, PLUS THE FOLLOWING ADDITIONAL FEATURES-

- TRACE MODE OPTION, TO AID THE USER IN DEBUGGING DURING OBJECT-TIME EXECUTION.
- A LIST OPTION, TO INDICATE A DATA STORAGE MAP OF THE SOURCE PROGRAM.
- MASS STORAGE /DISK/ AND PUNCHED DATA CARD PROCESSING STATEMENTS. THESE FEATURES ENABLE USERS TO INCORPORATE 1301/2302 DISK STORAGE DEVICES AND ON-LINE PUNCHED CARD DATA PROCESSING EQUIPMENT INTO HIS COBOL PROGRAMS. THE MASS STORAGE STATEMENTS PROVIDE FOR PROCESSING SEQUENTIAL OR RANDOMLY ORGANIZED DISK FILES IN SEQUENTIAL ORDER. THE NEW HOLD VERB ALLOWS FOR USER DETERMINED OVERLAP WITHIN HIS DISK PROGRAM. THESE NEW FEATURES IN NO WAY DEGRADE THE COMPILING SPEEDS OF THIS NEW COBOL COMPILER AND OPERATE IN THE SAME COMPILING ENVIRONMENT. THE USER STILL PRECOMPILES HIS I/O PACKAGE, BUT WITH DISK STATEMENTS IF DISK PROCESSING IS DESIRED.

PRECOMPILED IOCS ROUTINE, I.E., THE USER NEED COMPILE HIS IOCS ROUTINES ONLY ONCE. THE PRECOMPILED IOCS CAN THEN BE USED FOR ANY NUMBER OF OBJECT PROGRAMS.

PRECOMPILED SUBPROGRAMS, I.E., THE USER MAY WRITE HIS OWN SUB-PROGRAMS FOR EXECUTION WITH ANY OBJECT PROGRAM DESIRED. HE MAY THEN CALL THESE SUBPROGRAMS FOR INCLUSION IN THE MAIN PROGRAM VIA THE COBOL ,,CALL,, STATEMENT.

PROGRAM SEGMENTATION, I.E., THROUGH THE USE OF THE CHAIN OPTION OF THE FLAG MONITOR, COMPILATION AND EXECUTION OF PROGRAMS THAT EXCEED AVAILABLE MEMORY SIZE IS POSSIBLE.

ADDITIONAL COBOL LANGUAGE FEATURES, WHICH PROVIDE SEVERAL PROGRAMMING CAPABILITIES TO THE PROGRAMMER, ARE- EXAMINE VERB /ITS ASSOCIATED TALLY REGISTER... CORRESPONDING OPTION OF THE MOVE, ADD, AND SUBTRACT VERBS... BLANK CLAUSE... JUSTIFIED RIGHT CLAUSE... DECLARATIVES SECTION /USE VERB/ OF THE PROCEDURE DIVISION. THE SAME PROGRAMS COMPILED AN AVERAGE OF 30 TIMES FASTER WHEN THE GO OPTION OF THE COBOL/FORTRAN OPERATING SYSTEM WAS USED.

THE GO OPTION REQUESTS THE LOADER TO LOAD THE GENERATED OBJECT PROGRAM FOR IMMEDIATE EXECUTION. THESE TIMINGS INCLUDE LOADER TIME AND THE TIMINGS OF ALL THE TASKS OUTLINED ABOVE EXCEPT JOBT.

OBJECT PROGRAM EFFICIENCY, IN BOTH CORE REQUIREMENTS AND SPEED OF THE GENERATED PROGRAM, IS EQUIVALENT TO THAT OF PROGRAMS PRODUCED BY THE PRESENT COBOL PROCESSOR.

THE NEW COBOL COMPILER DOES NOT PERMIT THE USE OF 7340 HYPERTAPE DRIVES.

OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH.

BASIC PROGRAM MATERIAL - DOCUMENTATION - SAMPLE PROBLEM DESCRIPTION FOR FOS AND COBOL...PROGRAM MATERIAL LIST...PROGRAMMING SYSTEMS MANUAL...COBOL/FORTRAN PROGRAMMING SYSTEMS MANUAL... USERS AND OPERATORS GUIDE.

MACHINE READABLE - FOS 1401 OBJECT PERIPHERAL PROGRAM...1401 PATCH CARD TO ELIMINATE USE OF READ RELEASE FEATURE... FOS AND COBOL SAMPLE PROGRAM DECKS...BOOTSTRAP CARDS... DELETED SYSTEMS TAPES

OPTIONAL PROGRAM MATERIAL - LISTING OF 1401 PROGRAM... MACHINE READABLE - FOS 1401 SOURCE PERIPHERAL PROGRAM... FOS LISTING TAPE...FIVE COBOL LISTING TAPES...TWO AUTOCHART LISTING TAPES ONE COBOL AND ONE FOS...ONE FOS SYMBOLICS- INPUT TO MULTIFILE RUN TAPE.

7070-IO-076 SPOOL SYSTEM ORDER THROUGH LOCAL IBM BRANCH OFFICE SPECIFY FILE NUMBER 7070-IO-076

PURPOSE THE SPOOL SYSTEM PROVIDES TWO PROGRAMS WHICH MAY BE RUN SIMULTANEOUSLY WITH THE MAIN PROGRAMS. THIS SYSTEM PROVIDES TAPE-TO-CARD, CARD-TO-TAPE, AND TAPE-TO-PRINTER OPERATIONS. ONE OR TWO OF THESE OPERATIONS MAY TAKE PLACE WHILE THE USER'S MAIN PROGRAM IS RUNNING. RESTRICTIONS OPERATES IN CONJUNCTION WITH 7070 IOCS. STORAGE REQUIREMENTS 400 WORDS PLUS IOCS REQUIREMENTS. EQUIPMENT SPECIFICATIONS 7500 CARD READER AND NECESSARY I/O.

BASIC PROGRAM MATERIAL - DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS. CARD DECKS - SYMBOLIC PROGRAM DECKS.

7070-MI-084 TAPE FILE GENERATOR FOR TESTING ORDER THROUGH LOCAL IBM BRANCH OFFICE SPECIFY FILE NUMBER 7070-MI-084

PURPOSE THE TAPE FILES NEEDED TO TEST PROGRAMS WHICH READ INPUT RECORDS FROM TAPE CAN BE GENERATED FROM CARDS USING THIS UTILITY PROGRAM. PRACTICALLY ANY FORM OF TAPE FILE CAN BE CREATED WITH THIS PROGRAM. EQUIPMENT SPECIFICATIONS 7500 CARD READER 1 729 TAPE DRIVE.

BASIC PROGRAM MATERIAL - DOCUMENTATION - OPERATING INSTRUCTIONS... PROGRAM WRITE-UP. CARD DECK - CONDENSED PROGRAM DECK.

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OPTIONAL PROGRAM MATERIAL -  
SOURCE LANGUAGE DECK.  
OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

OPTIONAL

1. UP TO 4 ADDITIONAL IBM 729 II, IV, V OR VI MAGNETIC TAPE DRIVES
2. IBM 7500 CARD READER
3. IBM 7501 CONSOLE CARD READER
4. IBM 7550 CARD PUNCH
5. IBM 7400 PRINTER
6. UP TO 9 ADDITIONAL IBM 1301 DISK STORAGE MODULES.

7070-PR-075 7070/2/4 COMPILER SYSTEMS  
TAPE

\*M

ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7070-PR-075

COBOL PROCESSOR  
7070-CB-923

THE FOLLOWING PROGRAMS ARE CONTAINED ON THIS SYSTEM TAPE.  
7070 AUTOCODER 7070-AU-900  
7070 AUTOCODER 1301/DISK 7070-AU-900  
7070 COBOL PROCESSOR 7070-CB-923  
7070 FORTRAN 7070-FO-901  
7070 INPUT/OUTPUT CONTROL SYSTEM 7070-IO-904  
7070-7300 DISC INPUT/OUTPUT CONTROL SYSTEM 7070-10-905  
7070/74 IOCS FOR 1301 AND 2302 DISK STORAGE  
7074 IOCS FOR 7340 HYPERTAPE DRIVE 7074-10-948  
7070/7074 IOCS FOR THE IBM 7750 PROGRAMMED TRANSMISSION CONTROL  
7070-REPORT PROGRAM GENERATOR 7070-RG-902

THE COBOL PROCESSOR TRANSLATES A SOURCE PROGRAM WRITTEN IN ACCORDANCE WITH THE RULES SPECIFIED IN THE IBM COBOL GENERAL INFORMATION MANUAL, FORM F28-8083-1, INTO A 7070 OR 7074 MACHINE - LANGUAGE PROGRAM WHICH, WHEN READ INTO THE COMPUTER, EXECUTES THE INSTRUCTIONS SPECIFIED IN THE SOURCE PROGRAM.

THE PROGRAM IS TO BE USED AS DESCRIBED IN THE REFERENCE MATERIAL LISTED IN THE ACCOMPANYING LETTER WITH THE EXCEPTION OF THE FOLLOWING ITEMS WHOSE IMPLEMENTATION WILL BE DEFERRED -

AUTOCODER  
7070-AU-900

TO SIMPLIFY THE PREPARATION, CORRECTION AND INTERPRETATION OF PROGRAMS WRITTEN IN THE AUTOCODER LANGUAGE, INCLUDING MACRO STATEMENTS AND/OR ONE-FOR-ONE INSTRUCTIONS, INTO AN OPERATIVE MACHINE LANGUAGE PROGRAM FOR THE IBM 7070/2/4 DATA PROCESSING SYSTEMS.

PROCEDURE DIVISION

1. THE CORESPONDING OPTION OF THE MOVE VERB.
2. THE EXAMINE VERB /INCLUDING THE TALLY REGISTER/.
3. CLASS CONDITIONS IN CONDITIONAL STATEMENTS.
4. NUMERIC LITERALS AS OPERANDS OF DISPLAY STATEMENTS.
5. THE USE OF THE FIGURATIVE CONSTANT ALL.
6. THE ABILITY TO OPTIONAL ROUND OR TRUNCATE THE RESULTS OF ARITHMETIC COMPUTATIONS. THE ROUND OPTION IS STANDARD - TRUNCATION IS DEFERRED.

SOURCE LANGUAGE CARDS ARE READ FROM THE CARD READER OR TAPE UNIT WITH PROVISIONS TO PRODUCE LISTINGS AND OBJECT DECKS ON TAPE WITH PROVISIONS FOR OBTAINING EITHER OR BOTH ON-LINE.

ENVIRONMENT DIVISION

1. THE COPY OPTION.
2. THE OPTIONAL CLAUSE OF THE FILE-CONTROL PARAGRAPH.
3. AUTOMATIC ALLOCATION OF OBJECT MACHINE INPUT/OUTPUT DEVICES BASED ON CONFIGURATION GIVEN IN THE OBJECT-COMPUTER PARAGRAPH AND THE ASSIGN CLAUSE OF THE FILE-CONTROL PARAGRAPH.

MINIMUM

1. 5,000 WORDS OF CORE STORAGE
2. 6 IBM 729 MODEL II, IV, V, VI, OR 7330 TAPE UNITS
3. CHANNEL 1 OR CHANNELS 1 AND 2

THE 7070 COBOL PROCESSOR IS DESIGNED TO OPERATE ON A 7070 OR 7074 OF THE FOLLOWING CONFIGURATION--

1. MEMORY SIZE - 10K.
2. INPUT/OUTPUT REQUIREMENTS. SEVEN TAPES ARE REQUIRED BY THE SYSTEM. THE INPUT MEDIUM FOR THE SOURCE PROGRAM MAY BE ONE OF THESE SEVEN TAPES, AN EIGHT TAPE OR A CARD READER.

OPTIONAL

1. 10,000 WORDS OF CORE STORAGE
2. IBM 7500 CARD READER /UTILITY PANEL/
3. IBM 7550 CARD PUNCH /UTILITY PANEL/
4. IBM 7400 PRINTER /UTILITY PANEL/
5. UP TO FOUR ADDITIONAL IBM 729 MODEL II, IV, V, VI, OR 7330 TAPE UNITS.

FORTRAN  
7070/FO-901

PHASE I. THIS SECTION READS THE SOURCE PROGRAM, SEPARATES THE ONE-FOR-ONE STATEMENTS FROM THE MACRO STATEMENTS, AND CONSTRUCTS INTERNAL RECORDS REPRESENTING THE STATEMENTS OF THE SOURCE PROGRAM. THE RECORDS OF ONE-FOR-ONE STATEMENTS ARE PASSED DIRECTLY TO PHASE III - THE RECORDS OF THE MACRO STATEMENTS ARE PASSED TO PHASE II.

THE IBM FORMULA TRANSLATING SYSTEM, FORTRAN, IS AN AUTOMATIC CODING SYSTEM WHICH CONSISTS OF A SOURCE-LANGUAGE /CLOSELY RESEMBLING THE ORDINARY LANGUAGE OF MATHEMATICS/, AND A PROCESSOR WHICH, COMPLETELY OR PARTIALLY, CONVERTS SOURCE PROGRAMS WRITTEN IN THE FORTRAN LANGUAGE INTO MACHINE-LANGUAGE OBJECT PROGRAMS.

PHASE II. THE MACRO STATEMENTS ARE READ AND THE APPROPRIATE MACRO GENERATORS ARE CALLED IN FROM THE LIBRARY BY PHASE II. AFTER A GENERATOR HAS FINISHED PROCESSING A STATEMENT, THE CODING PRODUCED IS EITHER PASSED ALONG TO PHASE III /IF IT IS A ONE-FOR-ONE STATEMENT/ OR IS SAVED FOR ANOTHER RECURSION THROUGH PHASE II /IF IT IS A MACRO STATEMENT/.

FORTRAN IS ESSENTIALLY A PROBLEM-ORIENTED LANGUAGE DESIGNED TO FACILITATE THE WRITING OF PROGRAMS WHICH WILL PERFORM SCIENTIFIC AND ENGINEERING TYPE COMPUTATIONS. IT CAN ALSO BE ADOPTED IN THE SOLUTION OF MANY BUSINESS PROBLEMS WHICH CAN BE EXPRESSED IN A MATHEMATICAL FORMULA.

MACRO LIBRARY. THIS IS A GROUP OF GENERATORS, EACH OF WHICH IS DESIGNED TO ANALYZE A GIVEN MACRO STATEMENT, AND REDUCE IT EITHER TO ONE-FOR-ONE OR MACRO STATEMENTS. EACH GENERATOR IS CALLED IN BY PHASE II WHEN IT IS NEEDED, AND CONTROL GIVEN TO IT TO PERFORM ITS ANALYSIS AND GENERATION. INCLUDED AMONG THE MACRO GENERATORS ARE THOSE FOR THE INPUT/OUTPUT CONTROL SYSTEMS, NO. 7070-10-904, AND NO. 7070-10-940.

MINIMUM

1. 5,000 WORDS OF CORE STORAGE
2. 6 IBM 729 MODEL II, IV, V, VI OR 7330 TAPE UNITS
3. CHANNEL 1 OR CHANNELS 1 AND 2

PHASE III. ALL OF THE GENERATED AND INPUT ONE-FOR-ONE STATEMENTS ARE TRANSLATED INTO MACHINE LANGUAGE - CONDENSED CARDS AND A PROGRAM LISTING /INCLUDING ERROR MESSAGES AND A SYMBOLIC CROSS-REFERENCE LISTING/ ARE PRODUCED.

OPTIONAL

1. IBM 7500 CARD READER /UTILITY PANEL/
2. IBM 7400 PRINTER /UTILITY PANEL/
3. UP TO FOUR ADDITIONAL IBM 729 MODEL II, IV, V, VI OR 7330 TAPE UNITS.
4. 10,000 WORDS OF CORE STORAGE

AUTOSORT. THIS IS A SORT PROGRAM, LOCATED AT SEVERAL POINTS ON THE SYSTEM TAPE, WHICH ORDERS THE RECORDS PROCESSED BY AUTOCODER AS NEEDED.

PROGRAMS MAY BE COMPILED FOR ANY CONFIGURATION OF 7070 EQUIPMENT. 7070/2/4 FORTRAN ACCEPTS ALL FORTRAN II FEATURES IN A SOURCE PROGRAM.

SYSTEMS CONTROL. THIS AREA CONTROLS THE OPERATION OF THE COMPILER SYSTEM. IT HANDLES SUCH FUNCTIONS AS CONTROLLING THE MODE OF THE RUN, CONTROLLING THE ALLOCATION OF TAPE REELS, AND LOCATING AND LOADING CODING BLOCKS OF THE PROCESSOR SYSTEM AS THEY ARE REQUIRED.

INPUT/OUTPUT CONTROL SYSTEM  
7070-IO-904

AUTOCODER CAN PROCESS ANY PROGRAM WRITTEN FOR BASIC AUTOCODER OR FOUR-TAPE AUTOCODER. IF ADDITIONAL TAPE UNITS ARE AVAILABLE, IT CAN PROCESS STACKED INPUT AND/OR OUTPUT. ADDITIONAL MACRO GENERATORS CAN BE ADDED TO THE SYSTEM TO ALLOW NEW INPUT STATEMENTS. THERE IS GREAT FLEXIBILITY IN ENTERING NEW LOADS, PATCHING EXISTING LOADS, AND DROPPING UNNEEDED LOADS. ONLY ONE MACRO GENERATOR CAN BE ADDED OR DROPPED IN A SINGLE RUN.

TO PROVIDE USERS OF THE IBM 7070/2/4 DATA PROCESSING SYSTEMS WITH ROUTINES FOR READING AND WRITING CARD AND TAPE RECORDS, THE INPUT/OUTPUT CONTROL SYSTEM IS USED IN CONJUNCTION WITH OTHER PROGRAMS TO PROVIDE STANDARDIZED ROUTINES WHICH PERFORM THE INPUT AND OUTPUT FUNCTIONS.

AUTOCODER 1301/DISK  
7070-AU-900

MODIFICATION OF AUTOCODER, NO. 7070-AU-900, SO THAT THE 7070/2/4 COMPILER SYSTEMS CAN BE STORED ON AND USED FROM THE 1301 DISK STORAGE.

MACHINE REQUIREMENTS AT COMPILE TIME ARE DICTATED BY THE SPECIFICATIONS FOR THE PROGRAM WHICH IS BEING USED IN CONJUNCTION WITH THE INPUT/OUTPUT CONTROL SYSTEM. REFERENCE SHOULD BE MADE TO THE MANUAL OR ABSTRACT DESCRIBING THESE PROGRAMS. THE STORAGE REQUIREMENTS OF THE INPUT/OUTPUT CONTROL SYSTEM VARY FROM 765 TO 2100 WORDS DEPENDING UPON THE NUMBER OF FILES SPECIFIED AND THE PARAMETERS IN THE IOCS STATEMENT. THE READING AND WRITING OF TAPE RECORDS IS CONTROLLED BY THE INPUT/OUTPUT CONTROL SYSTEM AND WILL OCCUR SIMULTANEOUSLY WITH PROCESSING. MACRO-INSTRUCTIONS ARE PROVIDED FOR PROCESSING WHICH WILL, WHEN REQUIRED, BLOCK AND DEBLOCK DATA RECORDS THAT ARE TO BE WRITTEN ON, OR READ FROM, TAPE. A PROGRAM WHICH USED THE INPUT/OUTPUT CONTROL SYSTEM MAY BE INTERRUPTED AT ANY TIME AND CONTINUED FROM THAT POINT AT ANOTHER TIME BY THE USE OF THESE MACRO-INSTRUCTIONS. MACRO-INSTRUCTIONS ARE PROVIDED FOR PROCESSING UNIT RECORDS. ERROR ROUTINES FOR BOTH TAPE AND UNIT RECORDS ARE PROVIDED. THE INPUT/OUTPUT CONTROL SYSTEM HAS BEEN DESIGNED TO ALLOW THE RUNNING OF SPool PROGRAMS WITH PROGRAMS USING THE INPUT/OUTPUT CONTROL SYSTEM.

TO PROVIDE THE 7070/2/4 COMPILER SYSTEMS WITH THE CAPABILITY OF COPYING ITSELF ONTO THE 1301 DISK. THE 1301 DISK CAN THEN BE USED AS COMPILER PROGRAM STORAGE INSTEAD OF A SYSTEMS TAPE.

7300 DISC INPUT/OUTPUT CONTROL SYSTEM  
7070-10-905

THE COMPILER ON THE 1301 USES THE SAME LOGIC AS THE TAPE SYSTEM AND IS APPLICABLE TO ALL RUNS EXCEPT SYSTEMS RUNS WHICH WILL CONTINUE TO OPERATE WITH TAPE. THE MAJOR OPERATIONAL DIFFERENCE DURING A COMPILE OR GENERATOR RUN IS THE BOOTSTRAP TECHNIQUE. A SMALL DECK OF CONDENSED CARDS USING THE IBM 7070/7074 CONDENSED CARD LOAD PROGRAM WILL INITIATE THE OPERATION OF THE COMPILER. ALL OTHER OPERATIONAL FEATURES REMAIN UNCHANGED.

THE 7300 DISK IOCS PROVIDES USERS OF THE IBM 7070/2/4 DATA PROCESSING SYSTEMS WITH ROUTINES FOR READING AND WRITING 7300 DISK. USE OF PROGRAM OF THE INPUT/OUTPUT CONTROL SYSTEM IS USED IN CONJUNCTION WITH OTHER PROGRAMS TO PROVIDE STANDARDIZED ROUTINES WHICH PERFORM THE INPUT AND OUTPUT FUNCTIONS. MACHINE CONFIGURATION 1. MACHINE REQUIREMENTS AT COMPILE TIME ARE DICTATED BY THE SPECIFICATIONS FOR THE PROGRAM WHICH IS BEING USED IN CONJUNCTION WITH THE

- MINIMUM
1. 10,000 WORDS OF CORE STORAGE
  2. 5 IBM 729 II, IV, V OR VI MAGNETIC TAPE DRIVES
  3. 1 IBM 1301 DISK STORAGE MODULE OF WHICH AT LEAST 40 CYLINDERS ARE AVAILABLE FOR COMPILER PROGRAM

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INPUT/OUTPUT CONTROL SYSTEM. REFERENCE SHOULD BE MADE TO THE MANUAL OR ABSTRACT DESCRIBING THESE PROGRAMS. 2. THE STORAGE REQUIREMENTS OF THE INPUT/OUTPUT CONTROL SYSTEM VARY FROM 765 TO 2100 WORDS, DEPENDING UPON THE NUMBER OF FILES SPECIFIED AND THE PARAMETERS IN THE DIOCS STATEMENT.

## 7070/4-1301 INPUT/OUTPUT CONTROL SYSTEM 7070-10-940

IT PROVIDES THE USER WITH PRE-TESTED ROUTINES TO FACILITATE INPUT/OUTPUT FUNCTIONS BETWEEN 7070 AND 1301 DISK STORAGE UNITS OR 7074 AND 1301 AND/OR 2302 DISK STORAGE UNITS. THE FUNCTION OF THE PROGRAM IS TO REDUCE THE PROGRAMMING TIME AND EFFORT REQUIRED FOR PROGRAMS USING DISK STORAGE. THE PROGRAM MAY BE INCORPORATED INTO PROGRAMS USING INPUT/OUTPUT CONTROL SYSTEMS FOR OTHER DEVICES /E.G., 729, 7340 UNITS/.

- UNDER CONTROL OF MACRO-INSTRUCTIONS AND FILE SPECIFICATIONS TABLES INCLUDED IN THE SOURCE PROGRAM, THE 1301/2302 IOCS WILL PERFORM THE FOLLOWING FUNCTIONS--
- WRITE FORMAT TRACK.
- WRITE HOME ADDRESS IDENTIFIERS.
- WRITE AND/OR READ DATA IN THE FOLLOWING MODES- SINGLE RECORD... FULL TRACK WITHOUT ADDRESSES... FULL TRACK WITH ADDRESSES... CYLINDER /PROVIDED THE OPTIONAL FEATURE OF CYLINDER OPERATIONS IS PRESENT IN THE 7631 FILE CONTROL UNIT ATTACHED TO THE OBJECT COMPUTER/.
- DETECT AND ATTEMPT TO CORRECT ERRORS RESULTING FROM EITHER DATA TRANSFER BETWEEN THE 7070/7074 AND DISK STORAGE UNITS /E.G., READ/ OR OPERATIONS NOT INVOLVING DATA TRANSFER /E.G., SEEK/.
- SCHEDULE THE NECESSARY INPUT/OUTPUT OPERATIONS TO TAKE MAXIMUM ADVANTAGE OF THE 7070/7074 PRIORITY PROCESSING FEATURE.

THE PROGRAM WILL OPERATE SUCCESSFULLY WITH ANY COMBINATION OF 1301 AND 2302 DISK STORAGE UNITS WITHIN THE CONFIGURATION LIMITS OF STANDARD 7070/7074 SYSTEMS.

SYSTEM REQUIREMENTS ARE A 5K OR 10K 7070 OR 7074 SYSTEM WITH... 7907 DATA CHANNEL, 7631 FILE CONTROL... 1301 OR 2302 DISK STORAGE UNIT MDL 1 OR 2.

OPTIONAL- AN IBM 2302 DISK STORAGE UNIT CANNOT BE ATTACHED TO A STANDARD IBM 7070 DATA PROCESSING SYSTEM... IBM 1301 AND/OR 2302 DISK STORAGE UNITS MAY BE ATTACHED TO A STANDARD 7074 SYSTEM... A MAXIMUM OF TEN MODULES OF DISK STORAGE MAY BE ATTACHED TO EACH CHANNEL OF A 7907 DATA CHANNEL... ALL MODULES USING THE SAME CHANNEL OF A 7907 MUST BE CONNECTED TO THAT CHANNEL THROUGH THE SAME 7631 FILE CONTROL.

## 7074 IOCS FOR THE 1414 I/O SYNCHRONIZER MODEL 6 7070-10-947

TO ALLOW PROCESSING OF REAL-TIME MESSAGES AS THEY BECOME AVAILABLE AND PROCESSING OF ANY MAIN-LINE PROGRAM AT ALL OTHER TIMES, THE FOLLOWING FUNCTION TO BE OPERATED BY THE 1414-VI-IOCS. CONTROL THE READING AND WRITING OF MESSAGES, SCHEDULE THE PROCESSING OF INPUT MESSAGES, CONTROL ENTRY TO REAL-TIME ROUTINES AND SUBSEQUENT RETURN TO THE MAIN-LINE PROGRAM AND DETECT AND CORRECT ERRORS.

A 5K OR 10K 7070 OR 7074 SYSTEM, 7907 DATA CHANNEL /IF THE 1414 MDL 6 AND 1E TO 1301 STORAGE ARE TO BE OPERATED ON THE SAME CHANNEL, THE DATA CHANNEL SWITCH OPTIONAL FEATURE IS REQUIRED/, 1414 I/O SYNCHRONIZER MODEL 6 AND ONE OR MORE OF THE FOLLOWING INPUT/OUTPUT UNITS, USING MAXIMUM OF SIX BUFFERS ON THE 1414 MODEL 6- IBM 1009 DATA TRANSMISSION UNIT, IBM 1011 PAPER TAPE READER, IBM 1014 REMOTE INQUIRY UNIT AND TELEGRAPH INPUT/OUTPUT UNITS.

## 7074 IOCS FOR 7340 HYPERTAPE DRIVE 7074-10-948

THE 7074-7040 IOCS CONTROLS AND FACILITATES THE TRANSMISSION OF DATA BETWEEN THE IBM 7074 SYSTEM AND IBM 7340 HYPERTAPE DRIVES. IOCS PROVIDES EFFICIENT, STANDARDIZED ROUTINES FOR READING AND WRITING TAPE RECORDS. THESE ROUTINES HELP TO REDUCE PROGRAMMING TIME AND EFFORT. 7070 SERIES AUTOCODER MACRO-INSTRUCTIONS ARE USED TO INCLUDE IOCS ROUTINES IN THE USERS PROGRAM- THESE ROUTINES ARE INCORPORATED INTO THE PROGRAM DURING ASSEMBLY BY AUTO-CODER. MINIMUM MACHINE REQUIREMENTS ARE- 7074 SYSTEM WITH A 7907 DATA CHANNEL, MODEL 2, 3 OR 4, A 7640 FILE CONTROL UNIT AND ONE OR MORE 7340 HYPERTAPE DRIVES.

## 7070/74 IOCS PROGRAMMED TRANSMISSION CONTROL 7070-10-949

THE 7750 IOCS ALLOWS PROCESSING OF REAL-TIME MESSAGES AS THEY BECOME AVAILABLE AND ALLOWS PROCESSING OF MAIN-LINE PROGRAMS AT ALL OTHER TIMES. THE 7750 IOCS IS CAPABLE OF:

- CONTROLLING THE TRANSFER OF MESSAGES BETWEEN THE 7750 AND THE 7070.
- SCHEDULING THE PROCESSING OF INPUT MESSAGES.
- CONTROLLING ENTRY INTO USER-WRITTEN REAL-TIME ROUTINES AND SUBSEQUENT RETURN TO THE MAIN-LINE PROGRAM.
- DETECTING AND CORRECTING ERRORS THAT OCCUR AS A RESULT OF TRANSFERRING DATA FROM THE 7070 TO THE 7750.
- LOADING AND UNLOADING THE 7750.
- PROVIDING USER CONTROL OF THE 7750 THROUGH THE DATA CONTROL PACKAGE.

IN ORDER TO USE THE 7750 IOCS THE PROGRAMMER MUST PROVIDE A MINIMUM OF TWO AND A MAXIMUM OF SIX ROUTES, A DIOCS STATEMENT, AN END DIOCS STATEMENT, AND TWO DDF STATEMENTS. TO COMMUNICATE WITH THE 7750 IOCS, THE PROGRAMMER MUST USE THE MACRO-STATEMENTS LDCCP, PUT 7750, LOAD, ENDD, OPEN, CLOSE, PUT, LEVAT, IOCTL, AND DUMP, AVAILABLE IN THE AUTOCODER PORTION OF 7070-PR-075.

MINIMUM MACHINE REQUIREMENTS- 5K 7070 OR 7074 SYSTEM WITH ONE IBM 7750 PROGRAMMED TRANSMISSION CONTROL.

NOTE- THE 7750 PROGRAMMED TRANSMISSION CONTROL MUST BE THE ONLY INPUT/OUTPUT DEVICE OPERATING ON THE CHANNEL OF THE 7907 DATA CHANNEL TO WHICH IT IS ATTACHED WHILE THE 7750 IOCS IS IN USE.

REFERENCE MATERIAL-

NOTE- THE 7750 PROGRAMMED TRANSMISSION CONTROL MAY BE USED WITH OTHER TERMINAL UNITS, INCLUDING TELEGRAPH TERMINALS. INFORMATION ON THESE TERMINALS SHOULD BE OBTAINED FROM THE MANUFACTURERS CONCERNED.

## REPORT PROGRAM GENERATOR 7070-RG-902

PROGRAMS FOR WRITING REPORTS FROM DATA ON MAGNETIC TAPES CAN BE CREATED BY THE PROGRAMMING SYSTEM THROUGH THE USE OF THE REPORT PROGRAM GENERATOR.

CONTINUED FROM PRIOR COLUMN--

THE REPORT PROGRAM GENERATOR ACTS AS A PREPROCESSOR TO 7070/2/4 AUTOCODER. INPUT CONSISTS OF THE LAYOUT OF THE DATA TAPE, THE FORMAT OF THE DESIRED REPORT, AND THE CONDITIONS FOR INCLUSION OF ITEMS OF THE DATA.

### MINIMUM

1. 5,000 WORDS OF CORE STORAGE.
2. 6 IBM 729 MODEL II, IV, V, VI OR 7330 TAPE UNITS.
3. CHANNEL 1 OR CHANNELS 1 AND 2.

### OPTIONAL

1. IBM 7500 CARD READER /UTILITY PANEL/
2. IBM 7550 CARD PUNCH /UTILITY PANEL/
3. IBM 7400 PRINTER /UTILITY PANEL/
4. UP TO FOUR ADDITIONAL IBM 729 MODEL II, IV, V, VI OR 7330 TAPE UNITS.
5. 10,000 WORDS OF CORE STORAGE

THE DATA FILE MAY CONSIST OF FORM 1, 2 OR 3 RECORDS. THE DATA FILE RECORDS MAY INCLUDE NO MORE THAN 99 FIELDS TO BE USED FOR THE REPORT. A GIVEN VARIABLE FIELD TO BE EDITED MAY BE NO MORE THAN 20 CHARACTERS.

IN ADDITION TO THE ABOVE LISTED ITEMS, THE FOLLOWING REFERENCE MATERIAL WILL BE HELPFUL IN IMPLEMENTING THIS SYSTEM.

1. IBM 7070/7074 COMPILER SYSTEMS- REPORT PROGRAM GENERATOR, C28-6113.

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. \*M

### BASIC PROGRAM MATERIAL -

- DOCUMENTATION - PROGRAM WRITE-UP... SAMPLE PROBLEM LISTINGS
- ...OPERATING INSTRUCTIONS... FLOWCHARTS.
- CARD DECKS - SAMPLE PROBLEM DECK... BOOTSTRAP DECK.
- ONE MAGNETIC TAPE - COMPILER SYSTEM TAPE.

### OPTIONAL PROGRAM MATERIAL -

- SIXTEEN MAGNETIC TAPES - ASSEMBLY LISTINGS - 7070-CB-923, /2 TAPES/...
- 7070-AU-900, /6 TAPES/... 7070-FG-901, /2 TAPES/...
- 7070-RG-902, /1 TAPE/.

## 7070-SI-079 SIMULATE 650 ON 7070 ORDER THROUGH LOCAL IBM BRANCH OFFICE SPECIFY FILE NUMBER 7070-SI-079

PURPOSE PROGRAMS WRITTEN FOR THE 650 /EXCEPT 650 MODEL IV/ MAY BE RUN ON AN IBM 7070 USING THIS PROGRAM. THE MACHINE CONFIGURATION OF THE 7070 SYSTEM MUST BE THE SAME AS A 650 SYSTEM FOR THE PROGRAM TO BE SIMULATED. THE SIMULATION PROGRAM WAS WRITTEN FOR STANDARD 650 SYSTEMS. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. \*M

### BASIC PROGRAM MATERIAL -

- DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.
- CARD DECK - CONDENSED PROGRAM DECK.

### OPTIONAL PROGRAM MATERIAL -

- ONE MAGNETIC TAPE - ASSEMBLY LISTINGS.
- SYMBOLIC DECK.

## 7070-SM-077 SORT 90 ORDER THROUGH LOCAL IBM BRANCH OFFICE SPECIFY FILE NUMBER 7070-SM-077

PURPOSE TAPE FILES CONTAINING RECORDS FROM 1 THROUGH 999 WORDS IN LENGTH CAN BE SORTED ACCORDING TO A CONTROL WORD THAT MAY HAVE FROM 1 THROUGH 160 CHARACTERS LOCATED IN FROM 1 THROUGH 10 FIELDS. THE TAPE RECORDS MAY BE FIXED- OR VARIABLE-LENGTH IN SINGLE OR BLOCKED FORM. THE MAXIMUM NUMBER OF TAPE RECORDS THAT MAY BE SORTED IS EQUAL TO THE NUMBER OF RECORDS WHICH CAN BE CONTAINED ON 4 FULL REELS OF TAPE. EQUIPMENT SPECIFICATIONS 4 THROUGH 16 MAGNETIC TAPE UNITS. ADDITIONAL COMMENTS THE ORDER OF MERGE OF THE PROGRAM DEPENDS ON THE NUMBER OF TAPE UNITS AVAILABLE. THE ORDER OF THE MERGE MAY BE EITHER 2, 3, 4 OR 9. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. \*M

### BASIC PROGRAM MATERIAL -

- DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS...
- SAMPLE PROBLEM LISTINGS.
- CARD DECK - CONDENSED PROGRAM DECK.

### OPTIONAL PROGRAM MATERIAL -

- TWO MAGNETIC TAPES - ASSEMBLY LISTINGS.

## 7070-SM-078 MERGE 91 ORDER THROUGH LOCAL IBM BRANCH OFFICE SPECIFY FILE NUMBER 7070-SM-078

PURPOSE UP TO 8 TAPE FILES MAY BE MERGED INTO ONE FILE THROUGH THE USE OF THIS PROGRAM. THE RECORD AND CONTROL WORD SPECIFICATIONS ARE THE SAME AS FOR SORT 90. THERE IS NO LIMIT ON THE NUMBER OF REELS THAT MAY BE REQUIRED FOR A FILE. EQUIPMENT SPECIFICATIONS FROM 3 THROUGH 26 MAGNETIC TAPE UNITS ARE REQUIRED BY MERGE 91. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL PROGRAM MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. \*M

### BASIC PROGRAM MATERIAL -

- DOCUMENTATION - PROGRAM WRITE-UP... SAMPLE PROBLEM LISTING...
- OPERATING INSTRUCTIONS.
- CARD DECK - CONDENSED PROGRAM DECK.



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OPTIONAL PROGRAM MATERIAL -  
ONE MAGNETIC TAPE - ASSEMBLY LISTINGS.

THE RESTORE DISK ROUTINE WILL RETURN DATA WRITTEN ON  
MAGNETIC TAPE BY THE DUMP DISK ROUTINE TO THE DISK STORAGE  
LOCATIONS FROM WHICH IT WAS UNLOADED.

7070-SM-148 SERIES GENERALIZED  
SORTING/MERGING PROGRAM \*M  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7070-SM-148

THE CLEAR DISK ROUTINE WILL FILL RECORD AREAS ON ANY  
NUMBER OF TRACKS WITH A NUMERICAL CHARACTER SPECIFIED IN  
CONTROL CARDS.

THE IBM 7070 SERIES GENERALIZED SORTING/MERGING PROGRAM WILL  
SORT OR MERGE FIXED LENGTH OR VARIABLE-LENGTH DATA RECORDS,  
SINGLE OR BLOCKED. THE PROGRAM IS SAID TO BE GENERALIZED BECAUSE  
IT IS CAPABLE OF MODIFYING ITSELF ACCORDING TO INFORMATION  
CONTAINED ON CONTROL CARDS. THE PROGRAM IS SUPPLIED IN SYMBOLIC  
FORM, READY FOR COMPILATION. TO READY THE PROGRAM FOR USE. THE  
USER MUST-

THE 7070/7074/1301 DISK UTILITY PROGRAMS REQUIRE AN IBM  
7070 OR 7074 DATA PROCESSING SYSTEM WITH A MINIMUM OF--  
5000 WORDS OF CORE STORAGE  
1 1301 DISK STORAGE  
1 IBM 7501 CONSOLE CARD READER OR  
1 IBM 7500 CARD READER OR  
1 IBM 729 II, 729 IV, 729 V, 729 VI, OR 7330 MAGNETIC  
TAPE UNIT

1. COMPILER THE PROGRAM  
2. COMPILER SEPARATELY A SUITABLE IOCS.  
3. PREPARE A PROGRAM TAPE USING THE PROGRAM DECKS PRODUCED BY THE  
TWO COMPILATIONS.

THE LOAD DISK, DUMP DISK, AND RESTORE DISK PROGRAMS  
FURTHER REQUIRE AT LEAST--  
1 IBM 729 II, 729 IV, 729 V, 729 VI, OR 7330 MAGNETIC  
TAPE UNIT.

THE PROGRAM REQUIRES AN IBM 7070/7072, OR 7074 DATA PROCESSING  
SYSTEM WITH 10,000 WORDS OF CORE STORAGE AND FIVE MAGNETIC TAPE  
UNITS WHICH MAY BE EITHER IBM 729 OR 7330 TAPE UNITS OR IBM 7340  
HYPERTAPE DRIVES.

1. PROGRAM DECKS  
2. FLOW CHARTS  
3. SAMPLE PROGRAM  
4. REFERENCE MANUAL

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*M  
REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\*  
PROVIDED MUST BE 2400 FEET IN LENGTH. \*

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*M  
REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\*  
PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST  
BE ITEMIZED ON THE ORDER CARD. \*

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... SAMPLE PROBLEM LISTINGS...  
FLOWCHARTS.  
CARD DECK - SAMPLE PROBLEM DECK.  
ONE MAGNETIC TAPE - SYMBOLIC CARD IMAGE ON TAPE.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... FLOWCHARTS... OPERATING  
INSTRUCTIONS.  
CARD DECK - CONDENSED PROGRAM DECK.

7070-UT-080 RAMAC UTILITIES  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7070-UT-080

PURPOSE THESE PROGRAMS PROVIDE FREQUENTLY NEEDED ROUTINES  
TO ASSIST IN THE USE OF THE 7300 DISK FILES ATTACHED TO THE  
7070. THE PROGRAMS ARE 1. CLEAR DISK, 2. DISK TO TAPE,  
3. TAPE-TO-DISK. STORAGE REQUIREMENTS 1500 POSITIONS PER  
PROGRAM. EQUIPMENT SPECIFICATIONS 7300 DISK STORAGE UNIT,  
7500 CARD READER, 729 TAPE UNITS.

## 7072

7072-UT-085 UTILITY PROGRAMS FOR  
ADDITIONAL STORAGE \*M  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7072-UT-085

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.  
CARD DECK - CONDENSED PROGRAM DECK.

PURPOSE THIS IS A COLLECTION OF 5 COMMONLY USED PROGRAMS.  
THEY ARE CONDENSED CARD LOAD PROGRAM FOR ADDITIONAL STORAGE.  
THIS PROGRAM IS DESIGNED TO LOAD A PROGRAM WHICH HAS BEEN  
PUNCHED INTO CARDS IN CONDENSED FORM. IT WILL LOAD  
CONDENSED CARDS WITH A MAXIMUM OF FIVE WORDS IN EACH CARD  
INTO SPECIFIED LOCATIONS. EXECUTE CARDS, I. E., CARDS  
CONTAINING INSTRUCTIONS WHICH ARE TO BE EXECUTED AS SOON AS  
THEY ARE READ, MAY BE INCLUDED AMONG THE CONDENSED CARDS.  
LOAD PROGRAM RELOCATOR FOR ADDITIONAL STORAGE THIS PROGRAM  
WILL ALLOW THE USER TO MOVE THE IBM 7072/7074 CONDENSED  
CARD LOAD PROGRAM FOR ADDITIONAL STORAGE FROM ITS CURRENT  
LOCATION TO ANY TWENTY-FIVE CONSECUTIVE LOCATIONS BELOW  
LOCATION 9999. IT IS NOT NECESSARY TO KNOW THE CURRENT  
LOCATION OF THE LOAD PROGRAM WHEN IT IS TO BE RELOCATED.  
ZERO STORAGE PROGRAM FOR ADDITIONAL STORAGE THIS GENERAL  
ZEROING PROGRAM MAY BE USED TO SET CORE STORAGE TO PLUS  
ZEROS REGARDLESS OF THE LOCATION OF THE LOAD PROGRAM. THE  
ZERO STORAGE PROGRAM MAY BE USED EVEN THOUGH THE USER DOES  
NOT KNOW THE LOCATION OF THE LOAD PROGRAM. TAPE MARK  
PROGRAM FOR ADDITIONAL STORAGE THIS PROGRAM IS USED TO  
WRITE A TAPE MARK ON A MAXIMUM OF SIX TAPE UNITS CONNECTED  
TO ANY ONE CHANNEL. A SEPARATE PROGRAM, WHICH CONSISTS OF  
ONE CARD, IS REQUIRED FOR EACH CHANNEL. TAPE REWIND  
PROGRAM FOR ADDITIONAL STORAGE THIS PROGRAM IS USED TO  
REWIND THE TAPE ON A MAXIMUM OF SIX TAPE UNITS CONNECTED  
TO ANY ONE CHANNEL. A SEPARATE PROGRAM, WHICH CONSISTS OF  
ONE CARD, IS REQUIRED FOR EACH CHANNEL. EQUIPMENT  
SPECIFICATIONS 7072/74 WITH ADDITIONAL STORAGE FEATURE.  
THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*M

OPTIONAL PROGRAM MATERIAL -  
SYMBOLIC DECK.  
OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\*  
PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST  
BE ITEMIZED ON THE ORDER CARD. \*

7070-UT-081 UTILITIES  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7070-UT-081

PURPOSE THESE UTILITY PROGRAMS PROVIDE FREQUENTLY NEEDED  
ROUTINES TO ASSIST IN THE TESTING AND OPERATION OF THE  
USERS 7070 PROGRAMS. THE FOLLOWING ARE INCLUDED CONDENSED  
CARD LOAD PROGRAM, LOAD PROGRAM RELOCATOR, ZERO STORAGE  
PROGRAMS, TAPE MARK PROGRAM, TAPE REWIND PROGRAM, TAPE FILE  
GENERATOR PROGRAM, SNAPSHOT PROGRAM, STORAGE PRINT PROGRAM,  
TAPE PRINT PROGRAM, BRANCH TRACE PROGRAM, TAPE DUPLICATION  
PROGRAM, TAPE COMPARE PROGRAM, UNLOAD STORAGE PROGRAM.  
EQUIPMENT SPECIFICATIONS 7500 CARD READER, 7400 PRINTER,  
7550 CARD PUNCH, TAPE DRIVES AS NEEDED.

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*M  
REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES\*  
PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST  
BE ITEMIZED ON THE ORDER CARD. \*

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS...  
LISTINGS.  
CARD DECK - CONDENSED PROGRAM DECK.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.  
CARD DECK - PROGRAM DECK.

OPTIONAL PROGRAM MATERIAL -  
ONE MAGNETIC TAPE - SOURCE LANGUAGE.

OPTIONAL PROGRAM MATERIAL -  
ONE MAGNETIC TAPE - SOURCE LANGUAGE FILE.

7070-UT-128 UTILITY PROGRAMS FOR THE  
7070/74-1301 DISK \*M  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7070-UT-128

THE 7070/7074/1301 DISK UTILITY PROGRAMS CONSIST OF SIX  
ROUTINES TO PERFORM CERTAIN COMMON OPERATIONS RELATED TO  
THE STORAGE, RETRIEVAL, AND PRESERVATION OF DATA IN IBM  
1301 DISK STORAGE. THE SIX ROUTINES PROVIDED ARE--

1. FORMAT TRACK GENERATION
2. HOME ADDRESS AND RECORD ADDRESS GENERATION
3. CLEAR DISK
4. LOAD DISK
5. DUMP DISK
6. RESTORE DISK

THE FORMAT TRACK GENERATION ROUTINE WILL GENERATE FROM  
SPECIFICATIONS IN CONTROL CARDS, CHARACTERS FOR A FORMAT  
TRACK AND WILL WRITE THEM ON ONE OR MORE FORMAT TRACKS.

THE HOME ADDRESS AND RECORD ADDRESS GENERATION ROUTINE  
WILL GENERATE FROM SPECIFICATIONS PROVIDED IN CONTROL  
CARDS, HOME ADDRESS IDENTIFIERS AND RECORD ADDRESSES AND  
WILL WRITE THEM ON ONE OR MORE TRACKS.

THE LOAD DISK ROUTINE WILL LOAD THE DATA CONTAINED IN TAPE  
RECORDS GENERATED BY THE USER INTO AN AREA OF DISK STORAGE  
DESIGNATED BY CONTROL CARDS.

THE DUMP DISK ROUTINE WILL WRITE ALL OF THE DATA IN AN  
AREA OF DISK STORAGE, DESIGNATED BY CONTROL CARDS, ONTO  
MAGNETIC TAPE.

7074-FI-02X PORTFOLIO SELECTION PROGRAM \*M  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7074-FI-02X

THE 7074 PORTFOLIO SELECTION PROGRAM /7074-FI-02X/, WAS DESIGNED  
TO PROVIDE GUIDANCE TO PORTFOLIO MANAGERS IN DEVELOPING  
INVESTMENT STRATEGIES, WILL BE ESPECIALLY SIGNIFICANT TO  
FINANCIAL INSTITUTIONS WHO MANAGE OR COUNSEL PORTFOLIOS FOR  
OTHERS, CORPORATIONS AND FINANCIAL INSTITUTIONS MANAGING THEIR  
INSURANCE COMPANIES, CORPORATIONS WITH PENSION AND RETIREMENT  
OWN PORTFOLIO, COMMERCIAL BANKS, BROKERAGE HOUSES, MUTUAL FUNDS,  
FUNDS, AND GOVERNMENT AGENCIES MANAGING PENSION FUNDS.  
DESCRIPTION- THIS PROGRAM, WRITTEN IN FORTRAN, IMPLEMENTS THE  
MARKOWITZ FORMULATION AND ALGORITHM TO CALCULATE INVESTMENT  
PORTFOLIOS GIVING OPTIMAL COMBINATIONS OF EXPECTED RETURN AND  
RISK, SATISFYING USER-SPECIFIED CONSTRAINTS, AND BASED ON THE  
USERS PROBABILITY ESTIMATES OF SECURITY PHILES. THESE ESTIMATES  
MAY BE SPECIFIED DIRECTLY OR INDIRECTLY WITH RESPECT TO ONE OR  
MORE MARKET INDEXES. THE PROGRAM IS MATHEMATICALLY SIMILAR TO  
THE IBM 7090 PORTFOLIO SELECTION PROGRAM /7090-FI-03X/, BUT  
INCORPORATES SUBSTANTIAL IMPROVEMENTS, PARTICULARLY WITH RESPECT  
TO EDITING OF INPUT DATA.

USE- THE PROGRAM REQUIRES AS INPUT- //1/ FOR EACH ASSET LISTED FOR  
POTENTIAL INVESTMENT, AN ESTIMATE OF THE INTEREST OR DIVIDEND TO  
BE REALIZED DURING THE INVESTMENT PERIOD AND A PROBABILITY  
ESTIMATE OF THE ASSETS MARKET VALUE AT THE END OF THE INVESTMENT  
PERIOD--THIS MAY BE MADE DEPENDENT ON THE VALUE OF A MARKET-INDEX  
WHICH MUST THEN BE SIMILARLY ESTIMATED. //2/ ESTIMATES OF  
STATISTICAL CORRELATIONS AMONG MARKET VALUES OF THE ASSETS--

## 7074

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CONTINUED FROM PRIOR PAGE--  
 THESE WILL BE IMPLICIT AND NEED NOT BE SPECIFIED DIRECTLY WHERE ASSET MARKET VALUES ARE ESTIMATED WITH RESPECT TO A MARKET INDEX., /3/ SPECIFICATION OF RESTRAINTS PLACED BY THE USER ON THE ALLOCATION OF INVESTMENT AMONG THE ASSETS., /4/ SPECIFICATION OF LEVELS OF EXPECTED RETURN FOR WHICH MINIMUM-RISK PORTFOLIOS ARE DESIRED. THE PROGRAM CALCULATES THE MINIMUM-RISK PORTFOLIOS ASSOCIATED WITH THESE LEVELS OF EXPECTED RETURN.  
 MINIMUM SYSTEM CONFIGURATION-- A 10K 7074 SYSTEM WITH A MINIMUM OF SEVEN MAGNETIC TAPE UNITS ON TWO OR MORE CHANNELS. FLOATING DECIMAL ARITHMETIC FEATURE IS NOT REQUIRED. PERIPHERAL EQUIPMENT SUCH AS AN IBM 1401 SYSTEM IS REQUIRED FOR OFF-LINE CARD-TO-TAPE AND TAPE-TO-PRINTER OPERATIONS.  
 THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. \*M  
 \*M  
 \*M  
 BASIC PROGRAM MATERIAL -  
 DOCUMENTATION - PROGRAM WRITE-UP... APPLICATION DIRECTORY... PROGRAM USERS MANUAL... SYSTEM MANUAL.  
 MAG. TAPE - ONE REEL CONTAINING... SYSTEM AND LISTINGS OF SOURCE AND OBJECT PROGRAMS... ONE SET OF TWO SAMPLE PROBLEM DECKS.

7074-UT-140 UTILITY PROGRAMS FOR THE \*M  
 7074/7340 ORDER THROUGH LOCAL IBM BRANCH OFFICE  
 SPECIFY FILE NUMBER 7074-UT-140

THE FOUR 7074-7340 UTILITY PROGRAMS ARE-- 1/ IBM 7074-7340 LOAD PROGRAM 2/ IBM 7074-7340 LOAD PROGRAM RELOCATOR 3/ IBM 7074-7340 TAPE PRINT PROGRAM AND 4/ IBM 7074-7340 ZERO STORAGE PROGRAM. THE LOAD PROGRAM WILL LOAD PROGRAMS THAT HAVE BEEN WRITTEN ON 7340 TAPES IN THE FORM OF CONDENSED CARD IMAGE RECORDS. EXECUTE CARDS MAY BE AMONG THE RECORDS. THE LOAD PROGRAM WILL PERFORM THE REQUIRED OPERATIONS BEFORE CONTINUING THE LOADING PROCESS. INCLUDED IN THE LOAD PROGRAM IS A REREAD OPTION THAT AUTOMATICALLY BACKSPACES AND REREADS A RECORD UP TO TEN TIMES WHEN A READ ERROR IS ENCOUNTERED. THE LOAD PROGRAM RELOCATOR ALLOWS THE USER TO CHANGE THE LOCATION OF THE LOAD PROGRAM IN STORAGE. THE TAPE PRINT PROGRAM MAY BE USED TO PRINT THE CONTENTS OF SECTIONS FROM 729 II, IV, V, VI OR 7340 TAPES. THE LISTING WILL BE EDITED AND MAY BE PRINTED ON-LINE OR WRITTEN ON TAPE FOR OFF-LINE PRINTING. THE ZERO STORAGE PROGRAM MAY BE USED TO SET CORE STORAGE WORDS TO PLUS ZEROS. THE UTILITY PROGRAMS MAY BE USED TO FACILITATE PROGRAM TESTING AND OPERATION. 7074 SYSTEM WITH 7907 DATA CHANNEL 7640 HYPERTAPE CONTROL AND 7340 HYPERTAPE DRIVE. IN ADDITION, FOR THE TAPE PRINT PROGRAM, A 729 II, IV, V, VI MAGNETIC TAPE UNIT OR 7400 PRINTER IS REQUIRED FOR THE OUTPUT.  
 THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. \*M  
 \*M  
 \*M

BASIC PROGRAM MATERIAL -  
 DOCUMENTATION - PROGRAM WRITE-UP... FLOWCHARTS... OPERATING INSTRUCTIONS.  
 CARD DECK - CONDENSED PROGRAM DECK.  
 OPTIONAL PROGRAM MATERIAL -  
 TWO MAGNETIC TAPES - /ONE TAPE/ - ASSEMBLY LISTINGS... /ONE TAPE/ SOURCE LANGUAGE FILES.

7074-UT-164 UTILITY PROGRAMS FOR 2302 \*M  
 DISK STORAGE ORDER THROUGH LOCAL IBM BRANCH OFFICE  
 SPECIFY FILE NUMBER 7074-UT-164

THEY CONSIST OF THE 7070/7074/1301 DISK UTILITIES, MODIFIED TO HANDLE THE ADDITIONAL ACCESS MECHANISM AND INCREASE STORAGE CAPACITY OF THE 2302. IN ADDITION, THE DUMP DISK AND RESTORE DISK PROGRAMS INCLUDE PLATTER DUMP AND RESTORE, AND HOME ADDRESS OPERATION CAPABILITY.  
 THE 7074/2302 DISK UTILITY PROGRAMS REQUIRE A 10K 7074 SYSTEM WITH... 7907 DATA CHANNEL... 7631 FILE CONTROL... 2302 DISK STORAGE... 7501 CONSOLE CARD READER OR 7500 CARD READER OR 729 II/IV/V/VI MAGNETIC TAPE UNIT.  
 THE LOAD DISK, DUMP DISK AND RESTORE DISK PROGRAMS FURTHER REQUIRE AT LEAST ONE 729 II/IV/V/VI MAGNETIC TAPE UNIT.  
 OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.  
 THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. \*M  
 \*M  
 \*M

BASIC PROGRAM MATERIAL -  
 DOCUMENTATION - PROGRAM WRITE-UP... STORAGE MAPS... USERS MANUAL WHICH INCLUDES A SAMPLE PROBLEM.  
 MACHINE READABLE - 1 TAPE CONTAINING TWO PROGRAM DECKS.  
 OPTIONAL PROGRAM MATERIAL - 1 SOURCE CARD TAPE... 1 LISTING TAPE.

## 7080

7080-CV-090 INT580 \*M  
 ORDER THROUGH LOCAL IBM BRANCH OFFICE  
 SPECIFY FILE NUMBER 7080-CV-090

PURPOSE INT580 ENABLES A PROGRAM CODED FOR AN IBM 705 I, II OR III WITH SERIAL INPUT/OUTPUT EQUIPMENT TO OPERATE ON THE IBM 7080, UTILIZING COMMUNICATION CHANNELS AND 729 TAPE UNITS. THE 754, 760 I AND II, 777 757, 758, 759, AND 734 ARE SIMULATED IN MEMORY. 727, 720A, 730A, 717, 722 AND 714 UNITS ARE SIMULATED ON 729 TAPE UNITS. RESTRICTIONS TO FULL SIMULATION ARE COVERED IN THE DETAILED DESCRIPTION OF INTERPRETATION OF EACH UNIT, STARTING AT PAGE 10 OF THE ENCLOSED PRELIMINARY MANUAL, AS AMENDED BY THE ADDENDA, ALSO ENCLOSED AND ON PAGE 19 OF THE MANUAL. THESE RESTRICTIONS SHOULD NOT AFFECT MOST OBJECT PROGRAMS.  
 INT580 MAY BE LOADED INTO MEMORY ONCE, AND LEFT THERE UNTIL THAT MEMORY IS NEEDED FOR ANOTHER APPLICATION. LOADING OF AN OBJECT PROGRAM IS INITIATED AFTER INT580 HOUSEKEEPING HAS BEEN ENTERED AND CONTROL CARDS, IF NECESSARY, HAVE BEEN PROCESSED FOR THAT PROGRAM. THE OBJECT PROGRAM IS ENTERED IN THE NORMAL MANNER AND PROCEEDS UNTIL AN INPUT/OUTPUT INSTRUCTION IS ENCOUNTERED. THE I/O INTERPRET FEATURE OF THE 7080, WORKING WITH THE NONSTOP SWITCH CAUSES AN

CONTINUED FROM PRIOR COLUMN--  
 AUTOMATIC INTERRUPT TO INT580, WHERE THE DESIRED OPERATION IS INITIATED OR FULLY ACCOMPLISHED. CONTROL RETURNS TO THE OBJECT PROGRAM UNTIL THE NEXT INTERRUPT. FOR A DETAILED DESCRIPTION OF THE VARIOUS WAYS TO USE INT580, SEE THE ADDENDA FOR VERSION 3 REFERRED TO ABOVE. MACHINE CONFIGURATION THE MINIMUM 7080 CONFIGURATION OF 80K MEMORY AND TWO COMMUNICATION CHANNELS IS REQUIRED. THE PROGRAM AS WRITTEN REQUIRES THE CARD READER FOR ONE CONTROL CARD PER OBJECT PROGRAM, BUT THIS IS EASILY MODIFIED. DRUM SIMULATION WILL REQUIRE AN ADDITIONAL 80K OF MEMORY IF MANY SECTIONS ARE USED. FOUR COMMUNICATION CHANNELS ARE REQUIRED FOR EFFICIENT SIMULATION OF SIMULTANEOUS PRM-WR OPERATIONS ON TWO TRC S.  
 THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. \*M  
 \*M

BASIC PROGRAM MATERIAL -  
 DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.  
 ONE MAGNETIC TAPE - RE-ASSEMBLY LISTING.

7080-IO-120 705 III MEMORY RESTORE \*M  
 SYSTEM FOR USE WITH SUPERVISORY CONTROL SYSTEM-IOMRSC  
 ORDER THROUGH LOCAL IBM BRANCH OFFICE  
 SPECIFY FILE NUMBER 7080-IO-120

IOMRSC IS A MODIFIED VERSION OF IOMRSB DEVELOPED TO PERMIT ITS USE WITH THE IBM 7080 SUPERVISORY CONTROL SYSTEM SCS80, #7080-SV-115. WITH A FEW MINOR EXCEPTIONS, ALL FEATURES, MESSAGES, AND PROCEDURES ARE THE SAME FOR IOMRSC AND IOMRSB. BOTH SYSTEMS OPERATE ONLY WITH CHECKPOINT RECORDS PRODUCED BY THE IBM 705 III INPUT/OUTPUT CONTROL SYSTEM /IOPKGB/, #0705-IO-047. MODIFICATION LETTER 13, TO 705 III IOCS CONTAINS REQUIRED CHANGES TO PREPARE CHECKPOINT RECORDS SUITABLE FOR USE WITH IOMRSC. IT IS NECESSARY THAT THIS MODIFICATION LETTER BE IMPLEMENTED PRIOR TO THE USE OF ITS CHECKPOINT RECORDS WITH THIS SYSTEM. THIS SYSTEM WILL RESTORE THE CONTENTS OF MEMORY FROM CHECKPOINT RECORDS IN THE SAME MANNER AS IOMRSB. THE PRINCIPAL DIFFERENCE IS AN ADDED ROUTINE TO REPOSITION THE SCS80 PROGRAM TAPE DURING A RESTART. DETAILED OPERATING PROCEDURES ARE AVAILABLE IN THE MANUAL FOR IOMRS. ALL TAPES IN USE BY THE OBJECT PROGRAM MUST BE REMOUNTED ON TAPE DRIVES RELATED TO THE ORIGINAL ADDRESSES. IOMRSC REQUIRES THAT THE 7908 CONSOLE 40K KEY BE SET FOR 80K MEMORY. BECAUSE OF THIS, IT CANNOT RESTORE OBJECT PROGRAMS WHICH RELY ON MEMORY WRAPAROUND AT 40K. SINCE ONLY THE FIRST 80K OF MEMORY IS RECORDED AT THE TIME THE CHECKPOINT IS WRITTEN, NO ATTEMPT IS MADE TO RESTORE MEMORY ABOVE 80K.  
 THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS REQUESTED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. \*M  
 \*M  
 \*M

BASIC PROGRAM MATERIAL -  
 DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS... FLOW CHARTS... LISTINGS  
 CARD DECK - CONDENSED PROGRAM DECK.  
 OPTIONAL PROGRAM MATERIAL -  
 ONE MAGNETIC TAPE - ASSEMBLY LISTING.

7080-IO-121 MEMORY RESTORE SYSTEM -- \*M  
 CSMS ORDER THROUGH LOCAL IBM BRANCH OFFICE  
 SPECIFY FILE NUMBER 7080-IO-121

THE MEMORY RESTORE SYSTEM RESTARTS AN OBJECT PROGRAM AT AN INTERMEDIATE POINT. THE PROGRAM TO BE RESTARTED MUST CONTAIN ROUTINES FOR 729 IOCS AND/OR HYPERTAPE IOCS. THE IOCS MUST INCLUDE THE MEMORY RECORD SECTION, WHICH TAKES THE CHECKPOINTS REQUIRED FOR THE RESTART. THE MEMORY RESTORE SYSTEM CAN BE PLACED IN THE CONSOLE CARD READER OR ON 729 TAPE OR HYPERTAPE. THE RESTART CAN BE INITIATED FROM MEMORY OR TAPE.  
 MACHINE REQUIREMENTS-- THE MEMORY RESTORE SYSTEM OPERATES ON 7080 DATA PROCESSING SYSTEM USING UP TO FOUR 729 CHANNELS AND/OR 2 CHANNELS OF HYPERTAPE ATTACHED THROUGH A 7908 DATA CHANNEL, MODELS 2-9.  
 THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. \*M  
 \*M  
 \*M

BASIC PROGRAM MATERIAL -  
 DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS... FLOW CHARTS.  
 CARD DECK - CONDENSED PROGRAM DECK.  
 OPTIONAL PROGRAM MATERIAL -  
 ONE MAGNETIC TAPE - ASSEMBLY LISTING.

7080-PR-132 COMPILING SYSTEM TAPE \*M  
 ORDER THROUGH LOCAL IBM BRANCH OFFICE  
 SPECIFY FILE NUMBER 7080-PR-132

THE FOLLOWING PROGRAMS ARE CONTAINED ON THIS SYSTEM TAPE.  
 7080 PROCESSOR 7080-PR-930  
 7080 PROCESSOR LIBRARY 7080-LM-931  
 7080 INPUT/OUTPUT CONTROL SYSTEM LIBRARY 7080-IO-932  
 7080 COBOL 7080-CB-933  
 7080 COBOL PROCESSOR LIBRARY 7080-LM-934  
 7080 INPUT/OUTPUT CONTROL SYSTEM FOR THE 7750 PROGRAMMED TRANSMISSION CONTROL, 7080-IO-932

PROCESSOR  
 7080-PR-930

7080 PROCESSOR-- THIS IS THE BASIC MODULE OF THE 7080 COMPILING SYSTEM IN THE SENSE THAT IT PROVIDES THE ASSEMBLY FACILITY OF THE COMPILING SYSTEM. THE 7080 PROCESSOR COMPILES PROGRAMS WRITTEN IN AUTOCODER AND THE HIGHER LANGUAGES -- FORTRAN, REPORT/FILE, DECISION, ARITHMETIC, AND TABLE-CREATING. PROGRAMS CODED FOR COMPILE BY THE 7058 PROCESSOR ARE, IN MOST RESPECTS, ACCEPTABLE AS INPUT TO THE 7080 PROCESSOR. 7080 FORTRAN AS IMPLEMENTED IN VERSION 2 OF THE 7080 PROCESSOR IS AN EXTENSION OF 705 FORTRAN. AREAS OF POSSIBLE INCOMPATIBILITY ARE THE TRUNCATION OF VARIABLE NAMES FROM A MINIMUM OF TEN

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CHARACTERS TO SIX, AND PUNCH AND PRINT COMMANDS, WHICH ARE NOT IMPLEMENTED. HOWEVER, BY MEANS OF CONTROL CARDS, THE PUNCH AND PRINT COMMANDS CAN BE CONVERTED TO TAPE OPERATIONS. IN 7080 FORTRAN, THE VARIOUS STATEMENTS CONCERNING INPUT AND OUTPUT MAY BE WRITTEN AS READ AND WRITE, AND THE TYPE STATEMENT MAY BE USED. THE OBJECT PROGRAM INPUT/OUTPUT ROUTINES PRODUCED BY 7080 FORTRAN ARE DIFFERENT FROM THOSE OF THE 7080 INPUT/OUTPUT CONTROL SYSTEM. ALL INPUT/OUTPUT OPERATIONS IN NON-FORTRAN PORTIONS OF A PROGRAM MUST BE COMPLETED BEFORE ANY FORTRAN OPERATIONS ARE GIVEN. HOWEVER, FORTRAN WILL COMPLETE ITS OWN OPERATION AND WILL RESTORE THE NECESSARY INFORMATION FOR THE NON-FORTRAN PORTION OF THE PROGRAM. THERE ARE ALSO MANY IMPROVEMENTS IN THE TREATMENT OF SUBSCRIPTED VARIABLES. OBJECT PROGRAM OPERATIONS ON THEM WILL MAKE USE OF INDIRECT ADDRESSING, AND ALL SUBSCRIPTING UNDER CONTROL OF A DO STATEMENT WILL BE OPTIMIZED. THEREFORE, 705 FORTRAN PROGRAMS WHEN ASSEMBLED BY 7080 FORTRAN WILL AUTOMATICALLY PRODUCE A MORE EFFICIENT OBJECT PROGRAM. ALSO, DIMENSIONS OF SUBSCRIPTED VARIABLES MAY BE INTEGER VARIABLES AND VARIED AT ANY POINT IN THE PROGRAM NOT INSIDE THE RANGE OF A DO STATEMENT. WHILE EMPLOYING THE PROVEN LOGIC OF ITS PREDECESSOR, THE 7058 PROCESSOR, THE 7080 PROCESSOR REPRESENTS A CONSIDERABLE ADVANCE OVER IT BOTH AS A PROGRAMMING SYSTEM AND FROM THE POINT OF VIEW OF ITS OPERATION. NEW LANGUAGE FEATURES ALLOW GREATER CONTROL OVER THE FLOW OF THE PROGRAM AND INCREASE ITS EFFICIENCY. THIS IS PARTICULARLY TRUE WITH RESPECT TO MACRO-GENERATION, WHICH IS FULLY RECURSIVE. PROCESSOR OPERATION IS EXTREMELY FLEXIBLE, MOST OPTIONS BEING AVAILABLE VIA CONTROL CARDS. NOTeworthy AMONG THE NEW OPERATING FEATURES ARE PROVISIONS FOR BLOCKED INPUT, SECONDARY INPUT, EDITING RUNS, AND THE INTRODUCTION DURING AN ASSEMBLY RUN OF MACRO-INSTRUCTION LIBRARY CHANGES AND PROCESSOR PHASE MODIFICATIONS. EXITS ARE AVAILABLE TO FACILITATE COMMONLY REQUIRED MODIFICATIONS TO THE SYSTEM. THE DUPLICATION RUN WILL ACCOMMODATE PERMANENT CHANGES BOTH TO PROCESSOR PHASES AND THE LIBRARY IN A SINGLE RUN.

## PROCESSOR LIBRARY 7080-LM-931

AN EXTENSIVE COLLECTION OF MACRO-INSTRUCTIONS AND SUBROUTINES THAT CAN BE ELICITED BY MEANS OF SOURCE PROGRAM STATEMENTS TO PERFORM A LARGE VARIETY OF GENERAL-PURPOSE AND SPECIAL-PURPOSE FUNCTIONS IN AN OBJECT PROGRAM. AMONG THE FUNCTIONS OF GENERAL-PURPOSE MACRO-INSTRUCTIONS ARE ASSEMBLY CONTROL, DATA POSITION, DATA LISTING, PROGRAM BRANCH CONTROL, AUTOMATIC DECIMAL POINT ARITHMETIC, ADDRESS MODIFICATION, AND TABLE MAINTENANCE. THROUGH THE MEDIUM OF THE 7080 PROCESSOR, LIBRARY MATERIAL CAN BE ADDED DELETED AND REPLACED. THE 7080 PROCESSOR ACCEPTS AS INPUT BLOCKED OR UNBLOCKED CARD IMAGE RECORDS IN THE FORMAT OF ONE OR MORE OF THE SOURCE LANGUAGES LISTED ABOVE. CHANGES TO THE SOURCE FILE MAY BE ENTERED FROM A SECONDARY INPUT UNIT. THE 7080 PROCESSOR WILL PROCESS THIS INPUT AND PRODUCE AN OUTPUT CONSISTING OF A CARD IMAGE TAPE OF PROGRAM CARDS READY FOR LOADING INTO A 7080, AND A LISTING TAPE SUITABLE FOR PRINTING ON ANY IBM PERIPHERAL PRINTING EQUIPMENT. A TAPE WHICH MAY BE USED AS INPUT TO A REASSEMBLY OR HIGH-SPEED ASSEMBLY RUN IS ALSO PRODUCED. THE PROCESSOR PERMITS THE OPTION OF TERMINATING PROCESSING AT KEY POINTS AND PROVIDING AN ANNOTATED LISTING DESCRIBING ERRORS DETECTED UP TO THE POINT OF TERMINATION, IN EFFECT ALLOWING USE OF THE SYSTEM TO EDIT THE SOURCE PROGRAM BEFORE IT IS COMMITTED TO A FULL ASSEMBLY. THIS AND OTHER OPTIONS ARE AVAILABLE BY VARIOUS MEANS INCLUDING CONTROL CARDS AND THE CONSOLE INTERRUPT KEYS. THE 7080 PROCESSOR OPERATES EXCLUSIVELY ON A 7080 IN 7080 NONSTOP MODE AND REQUIRES A MINIMUM OF MEMORY AND TEN 729 TAPE UNITS WHICH MAY BE ON FROM ONE TO FOUR CHANNELS. THE SYSTEM CAN USE AS MANY AS 80,000 ADDITIONAL MEMORY POSITIONS AND SIX ADDITIONAL TAPE UNITS TO INCREASE THE EFFICIENCY OF COMPILATION. USE OF A CARD READER IS OPTIONAL.

## INPUT/OUTPUT CONTROL SYSTEM LIBRARY 7080-IO-932 - DISK

THE 729 IOCS AND 1301/2302 IOCS CAN BE ASSEMBLED EITHER INDEPENDENT OF OR WITH OBJECT PROGRAMS. IF THEY ARE INDEPENDENTLY ASSEMBLED, OBJECT PROGRAMS USING THEM WILL BE PROVIDED WITH LINKAGES TO THE IOCS ROUTINES. WHEN AN OBJECT PROGRAM USES 729 IOCS AND 1301 IOCS, BOTH SYSTEMS MUST BE ASSEMBLED WITH THE SAME POSITION, DATA LISTING OR INDEPENDENT OF THE PROGRAM. IN THE LATTER CASE, BOTH SYSTEMS MUST BE ASSEMBLED IN THE SAME 7080 PROCESSOR RUN. HOWEVER, THEY NEED NOT OCCUPY CONTIGUOUS MEMORY LOCATIONS. THE 729 IOCS PROVIDES ROUTINES THAT RELIEVE THE USER OF THE NEED TO PROGRAM TAPE INPUT/OUTPUT OPERATIONS. SPECIFICALLY, THE 729 IOCS WILL -

1. CONTROL ALL TAPE MOVEMENT TO PERMIT OVERLAP OF READING, WRITING AND PROCESSING.
2. HANDLE RECORDS INDIVIDUALLY, THROUGH THEY MAY BE READ FROM OR WRITTEN ON TAPE IN BLOCKED FORM.
3. CHECK THE HEADER AND TRAILER LABELS OF EACH REEL OF TAPE.
4. PROVIDE CHECKPOINT AND RESTART ROUTINES.

5. DETECT AND CORRECT, WHEN POSSIBLE, TAPE READ AND WRITE ERRORS.

THE 729 IOCS IS TAILORED TO THE REQUIREMENTS OF THE USER BY MEANS OF THE DEFINE INPUT/OUTPUT CONTROL SYSTEM /DIOCS/ MACRO-INSTRUCTION. THE DATA FILES AND TAPE UNITS USED BY THE OBJECT PROGRAM ARE SPECIFIED WITH DESCRIPTIVE MACRO-INSTRUCTIONS. SPECIFIC TAPE FUNCTIONS ARE PERFORMED BY LINKAGE MACRO-INSTRUCTIONS WRITTEN AT APPROPRIATE POINTS IN THE OBJECT PROGRAM. THE 729 IOCS REPLACES THE SORT 80 /7080-IO-086/, AN EARLIER INPUT/OUTPUT CONTROL SYSTEM FOR 729 MAGNETIC TAPE UNITS. A 729 IOCS CAN BE GENERATED FOR OBJECT PROGRAMS THAT NOW USE VERSION 1 OR VERSION 2 OF IOCS80 WITHOUT REASSEMBLING THE OBJECT PROGRAMS. THE 729 IOCS OPERATES ON ANY 7080 DATA PROCESSING SYSTEM WITH TWO OR FOUR TAPE CHANNELS. AS MANY AS TEN TAPE UNITS CAN BE ATTACHED TO ONE CHANNEL.

THE 1301/2302 IOCS PROVIDES ROUTINES THAT RELIEVE THE USER OF THE NEED TO PROGRAM DISK INPUT/OUTPUT OPERATIONS.

SPECIFICALLY, THIS IOCS WILL -

1. CONTROL ALL DISK OPERATIONS TO PERMIT OVERLAP OF DISK INPUT/OUTPUT FUNCTIONS WITH EACH OTHER AND WITH PROCESSING.
2. BLOCK AND DEBLOCK RECORDS AND AUTOMATICALLY READ THEM FROM OR WRITE THEM INTO SEQUENTIAL AREAS OF DISK STORAGE.
3. INSURE THAT RANDOMLY LOCATED DISK RECORDS, WHEN READ, ARE PROCESSED AGAINST THE PROPER TRANSACTION RECORDS,

CONTINUED FROM PRIOR COLUMN--

UPDATED CORRECTLY, AND IF DESIRED, WRITTEN BACK INTO DISK STORAGE.

4. DETECT AND CORRECT, WHEN POSSIBLE, DISK READ AND WRITE ERRORS.

THE 1301 IOCS IS TAILORED TO THE REQUIREMENTS OF THE USER BY MEANS OF THE DEFINE INPUT/OUTPUT CONTROL SYSTEM /DIOCS/ MACRO-INSTRUCTION. THE DATA TO BE PROCESSED IS SPECIFIED WITH THE DEFINE DATA FILE /DDF/ MACRO-INSTRUCTION. SPECIFIC 1301 IOCS FUNCTIONS ARE PERFORMED BY LINKAGE MACRO-INSTRUCTIONS WRITTEN AT APPROPRIATE POINTS IN THE OBJECT PROGRAM. THE 1301/2302 IOCS OPERATES ON ANY 7080 DATA PROCESSING SYSTEM WITH ONE OR TWO 7631 FILE CONTROLS ATTACHED TO ANY 7908 DATA CHANNEL. THIS IOCS CONTROLS INPUT/OUTPUT OPERATIONS INVOLVING FROM ONE TO TWENTY 1301 OR 2302 DISK STORAGE UNITS. - A UNIT OF DISK STORAGE IS DEFINED AS A SET OF DISK SURFACES SERVICED BY ONE ACCESS MECHANISM.

## COBOL PROCESSOR 7080-CB-933

THE 7080 COBOL PROCESSOR 933 CONVERTS SOURCE PROGRAM ENTRIES WRITTEN IN THE COBOL 61 LANGUAGE INTO AUTOCODER ENTRIES FOR ASSEMBLY BY THE 7080 PROCESSOR INTO A 7080 MACHINE LANGUAGE PROGRAM. IN ADDITION, THE PROCESSOR WILL RECOGNIZE THE COBOL ENTER AUTOCODER STATEMENT IN THE PROCEDURE DIVISION OF A COBOL PROGRAM AND CONVERT THE ENTRIES WRITTEN IN AUTOCODER AND THE HIGHER LANGUAGES-- FORTRAN, REPORT/FILE, DECISION, ARITHMETIC AND TABLE CREATING. 7080 COBOL PROGRAMS WRITTEN FOR COMPILATION BY THE 705/7080 COBOL PROCESSOR ARE, IN MOST RESPECTS, ACCEPTABLE AS INPUT TO THE 7080 COBOL PROCESSOR. THE 7080 COBOL PROCESSOR IS A SUBSYSTEM OF THE 7080 COMPILING SYSTEM WHICH OPERATES IN CONJUNCTION WITH THE 7080 PROCESSOR.

## COBOL PROCESSOR LIBRARY 7080-LM-934

THE COBOL LIBRARY 7080-LM-934 CONSISTS OF MACRO-INSTRUCTIONS AND SUBROUTINES WRITTEN IN AUTOCODER LANGUAGE FOR USE BY THE COBOL PROCESSOR. THIS MATERIAL AUGMENTS THE 7080 PROCESSOR LIBRARY ON THE SYSTEM TAPE. THE COBOL LANGUAGE DEFERRED FEATURES THAT ARE LISTED IN THE BULLETIN 705/7080 COBOL - ADDITIONAL SPECIFICATIONS /FORM J28-1177-2/ ARE NOT AVAILABLE WITH THIS VERSION OF THE COBOL PROCESSOR. THE 7080 COBOL PROCESSOR OPERATES EXCLUSIVELY ON A 7080 IN 7080 NONSTOP MODE AND REQUIRES A MINIMUM OF 80,000 POSITIONS OF MEMORY AND TEN 729 TAPE UNITS WHICH MAY BE ON FROM TWO TO FOUR CHANNELS. THE PROCESSOR CAN USE AS MANY AS 80,000 ADDITIONAL MEMORY POSITIONS TO INCREASE THE EFFICIENCY OF COMPILATION. USE OF A CARD READER IS OPTIONAL.

## INPUT/OUTPUT CONTROL SYSTEM FOR THE 7750 PROGRAMMED TRANSMISSION CONTROL 7080-IO-932

THE 7750 IOCS PROVIDES ROUTINES THAT FACILITATE /A/ PROCESSING OF REAL-TIME DATA WHEN SUCH DATA BECOMES AVAILABLE AND /B/ PROCESSING IN ANY MAIN-LINE ROUTINE AT ALL OTHER TIMES. THE 7750 IOCS ROUTINES PERFORM THE FOLLOWING FUNCTIONS: /1/ SCHEDULE AND INITIATE THE READING AND WRITING OF MESSAGES, /2/ SCHEDULE THE PROCESSING OF INCOMING MESSAGES, /3/ CONTROL ENTRY TO REAL-TIME ROUTINES AND SUBSEQUENT RETURN TO THE INTERRUPTED MAIN-LINE ROUTINES, /4/ DETECT AND CORRECT, WHERE POSSIBLE, ERRORS OCCURRING BETWEEN THE 7750 AND THE 7080, /5/ PROVIDE FOR INITIAL LOADING OF A 7750 STORED PROGRAM INTO THE 7750, /6/ PERMIT THE DYNAMIC LOADING OF 7750 STORED PROGRAM DATA INTO THE 7750, /7/ ENABLE 7750 STORAGE TO BE LOADED INTO 7080 MEMORY, /8/ SEND ORDERS TO THE 7750 STORED PROGRAM FROM THE 7080. THE USER MUST PROVIDE REAL-TIME ROUTINES FOR THE PROCESSING OF DATA. THE NATURE OF THE 7750 IOCS MUST BE SPECIFIED WITH THE DIOCS /DEFINE INPUT/OUTPUT CONTROL SYSTEM/ AND THE DDF /DEFINE DATA FILE/ MACRO-INSTRUCTIONS-- OTHER 7750 IOCS MACRO-INSTRUCTIONS ARE WRITTEN AT APPROPRIATE POINTS IN THE USERS PROGRAM TO DIRECT THE WRITING OF MESSAGES TO GENERATE LINKAGES TO THE ROUTINES WHICH PERFORM SPECIFIC INPUT/OUTPUT FUNCTIONS. THE 7750 IOCS CAN BE ASSEMBLED EITHER INDEPENDENT OF OR WITH THE USERS PROGRAMS. WHEN A PROGRAM USES OTHER 7080 IOCS IN ADDITION TO THE 7750 IOCS, ALL THE IOCS MUST BE ASSEMBLED THE SAME WAY, THAT IS, INDEPENDENT OF OR WITH THE PROGRAM. MOREOVER, WHEN ASSEMBLED INDEPENDENTLY, THEY MUST BE ASSEMBLED IN THE SAME PROCESSOR RUN. THEY NEED NOT OCCUPY CONTIGUOUS MEMORY LOCATIONS. THE 7750 IOCS REQUIRES-- 7750 PROGRAMMED TRANSMISSION CONTROL ATTACHED TO ANY MODEL 7908 DATA CHANNEL.

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. THE TAPES SUPPLIED SHOULD BE 2400 FEET IN LENGTH AND TESTED AT 556 BPI.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP...OPERATING INSTRUCTIONS...  
LISTINGS...FLOWCHARTS...SAMPLE PROBLEM.  
CARD DECK - SAMPLE PROBLEM DECK.  
TWO MAGNETIC TAPES - COMPILER SYSTEM TAPE /ONE TAPE/...  
PROCESSOR LIBRARY TAPE /ONE TAPE/.

OPTIONAL PROGRAM MATERIAL -  
EIGHT MAGNETIC TAPES - 7080-PR-930 ASSEMBLY LISTINGS /FIVE TAPES/...7080-CB-933 ASSEMBLY LISTINGS /THREE TAPES/.

7080-SM-114 SORT 80 FOR 7080 UNDER SUPERVISORY CONTROL 580USC ORDER THROUGH LOCAL IBM BRANCH OFFICE SPECIFY FILE NUMBER 7080-SM-114

SORT 80 PROGRAM SPECIFICATIONS AND FEATURES, OPERATING INSTRUCTIONS, ETC., ARE DETAILED IN THE REFERENCE MANUAL /IBM 705 111/7080 GENERALIZED SORTING PROGRAM SORT 80/ FORM C28-6125. A LIST OF THE OPERATING AND MODIFICATION FEATURES OF THE BASIC SORT 80 SYSTEM CAN BE UTILIZED TO FULL ADVANTAGE WITH ONE EXCEPTION MEMORY POSITIONS 75000 THROUGH 79999 MUST BE RESERVED FOR USE BY SCS80 AND 580USC EXECUTIVE ROUTINES.

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH.

# IBM Programs

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BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.  
CARD DECK - PROGRAM CONTROL DECK.  
ONE MAGNETIC TAPE - 7080USC/S80USC SYSTEM TAPE.

7080-SM-143 GENERALIZED SORTING PROGRAM  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7080-SM-143

\*M

THE 7080 GENERALIZED SORTING PROGRAM SORTS FIXED-LENGTH OR VARIABLE-LENGTH DATA RECORDS. THE LATTER CAN BE IN 7080 FORMAT OR INTER-MACHINE HYPERTAPE FORMAT. THE RECORDS MUST BE IN BLOCKED FORMAT, BUT THE BLOCKING FACTOR CAN BE AS LOW AS ONE. PHASE 3 OF THE PROGRAM CAN BE USED INDEPENDENTLY AS A ONE-TO-TEN-WAY GENERALIZED MERGING PROGRAM THAT WILL MERGE DATA RECORDS IN ANY OF THESE FORMATS. IN ADDITION TO THE FEATURES THAT HAVE BEEN INCORPORATED INTO VERSION 1 OF THE PRESENT PROGRAM, VERSION 2 PROVIDES THE FOLLOWING SIGNIFICANT NEW FEATURES--

1. 7340 HYPERTAPES CAN BE SPECIFIED FOR ANY FUNCTIONS.
2. THE READ-BACKWARD FEATURE OF HYPERTAPE IS UTILIZED WHEN FIXED-LENGTH RECORDS ARE SORTED ON HYPERTAPE MERGE TAPES.
3. RECORDS IN VARIABLE-LENGTH, INTER-MACHINE HYPERTAPE FORMAT CAN BE SORTED OR MERGED.
4. VARIABLE-LENGTH RECORDS IN 7080 FORMAT THAT ARE A MULTIPLE OF 30 CHARACTERS IN LENGTH CAN BE AUTOMATICALLY CONVERTED TO INTER-MACHINE FORMAT BEFORE BEING WRITTEN ON THE OUTPUT HYPERTAPE.

THIS PROGRAM IS DISTRIBUTED IN AUTOCODER LANGUAGE AND MUST BE ASSEMBLED BY THE USER. IT CAN BE ASSEMBLED WITH ANY STANDARD 7080 IOCS THAT INCLUDES THE APPROPRIATE 729 AND/OR 7340 IOCS FOR HANDLING THE INPUT/OUTPUT OF THE PROGRAM. BOTH THE SORT AND IOCS PROGRAMS MUST BE ASSEMBLED BY MEANS OF THE 7080 COMPILING SYSTEM, #7080-PR-132, VERSION 1 LEVEL 2, OR ANY LATER VERSION AND/OR LEVEL. MINIMUM MACHINE REQUIREMENTS-- A 80K OR 160K 7080 SYSTEM WITH...FOUR OR MORE 7340 HYPERTAPE DRIVES AND/OR 729 MAGNETIC TAPE UNITS. /AT LEAST THREE OF THE TAPES MUST BE OF THE SAME TYPE./ ONE TO FOUR 729 CHANNELS AND ONE OR TWO 7340 CHANNELS CAN BE UTILIZED, BUT AT LEAST TWO LIKE CHANNELS ARE REQUIRED FOR OPTIMUM EFFICIENCY. THIS NEW VERSION HAS BEEN MODIFIED TO PERMIT USE OF THE IBM 7340 HYPERTAPE DRIVES AND/OR 729 MAGNETIC TAPE UNITS. VERSION 1, ORIGINALLY DESIGNED FOR USE WITH 729 MAGNETIC TAPE UNITS ONLY, IS OBSOLETE. THE TIMING TABLES CONTAINED IN THE REFERENCE MANUAL SHOULD BE USED TO DETERMINE THE SORT TIME OF ANY SPECIFIC APPLICATION. NOTE THAT THE USE OF 7340 HYPERTAPE DRIVES WILL, FOR MOST APPLICATIONS, PROVIDE SUBSTANTIAL SAVINGS OVER THE USE OF 729 MAGNETIC TAPE UNITS.

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES \* PROVIDED MUST BE 2400 FEET IN LENGTH.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS...  
FLOW CHARTS... SAMPLE PROBLEM.  
CARD DECK - SAMPLE PROBLEM DECK.  
ONE MAGNETIC TAPE - SYMBOLIC CARDS ON TAPE.

7080-SV-087 NOSTP  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7080-SV-087

PURPOSE THE NOSTP MACRO-INSTRUCTION AND A SET OF ASSOCIATED SUBROUTINES ENABLE 705 AND 7080 PROGRAMS, RUNNING ON THE 7080, TO UTILIZE THE NON-STOP OPERATION FEATURE OF THAT MACHINE. THE USE OF THESE ROUTINES, IN CONJUNCTION WITH THE NON-STOP OPERATION FEATURE, WILL PERMIT CONTINUOUS OPERATION OF THE 7080 IN AUTOMATIC STATUS.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.  
CARD DECK - CONDENSED PROGRAM DECK.

7080-SV-115 SUPERVISORY CONTROL SYSTEM  
SCS80  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7080-SV-115

\*M

PURPOSE TO REDUCE THE TIME AND EFFORT REQUIRED TO PERFORM THE SET-UP FUNCTIONS FOR /PRODUCTION/ 7080 RUNS. SCS80 WILL, UPON COMMAND, LOCATE A PROGRAM ON THE PROGRAM TAPE, LOAD IT INTO MEMORY, VERIFY THE CONSOLE SET-UP, AND TRANSFER CONTROL TO THE OBJECT PROGRAM. THE PROGRAM TAPE /S/ USED AT OBJECT TIME WILL CONTAIN A COPY OF MEMORY PRINT /MP7080/ AT THE BEGINNING OF EACH REEL. SCS80 WILL ALSO ASSIST THE 7080 USER IN HOLDING PROGRAM FILE MAINTENANCE TO A MINIMUM. THIS IS ACCOMPLISHED THROUGH THE POWERFUL ABILITY TO /CALL IN/ COMMON PROGRAMS AND/OR ROUTINES IN ORDER TO /COMPLETE/ OBJECT PROGRAMS. NATURALLY, THE COMMON PROGRAMS AND ROUTINES NEED MAINTENANCE ONLY ON THE /SOURCE/ COPY. USE OF PROGRAM SCS80 PROVIDES 1. A PROGRAM LIBRARY MAINTENANCE FACILITY, 2. ABILITY TO SELECT /CURRENT/ PROGRAMS, 3. AN OBJECT TIME ROUTINE. MACHINE CONFIGURATION A. THE LIBRARY MAINTENANCE PROGRAM MEMORY SIZE -80K /MINIMUM/ 6 IBM 729 MAGNETIC TAPE UNITS /MINIMUM/ CONSOLE CARD READER B. THE PRODUCTION OF A CURRENT TAPE MEMORY SIZE - 80K /MINIMUM/ 5 IBM 729 MAGNETIC TAPE UNITS /MINIMUM/ CONSOLE CARD READER C. SCS80 OBJECT TIME ROUTINE MEMORY 80 TO #159 PLUS 2700 CHARACTERS BEGINNING AT A 0 OR 5 LOCATIONS ABOVE #499 1 IBM 729 MAGNETIC TAPE UNIT /MINIMUM/ CONSOLE CARD READER THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES \* PROVIDED MUST BE 2400 FEET IN LENGTH.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.  
ONE MAGNETIC TAPE - 7080SCS/SCS80 SYSTEM TAPE.

7080-UT-089 UTILITIES  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7080-UT-089

\*M

PURPOSE THIS IS A COLLECTION OF EIGHT COMMONLY USED UTILITY PROGRAMS. DATA ASSEMBLER /DA7080/ THE DATA ASSEMBLER IS CAPABLE OF CREATING DATA FILES FROM CARD IMAGE RECORDS ON TAPE. THERE IS PROVISION FOR SEARCHING THE INPUT TAPE FOR THE CORRECT DATA SET AND THEN PROCESSING THROUGH TO AN /END/ CARD. THE FILES CREATED BY DA7080 MAY BE OF FIXED OR VARIABLE LENGTH, BLOCKED OR UNBLOCKED, MULTIFILE OR SINGLE FILE AND LABELED OR UNLABELED. EXPANDED LOAD PROGRAM /EL 7080/ THE EXPANDED LOAD PROGRAM FOR THE 7080 WILL BE CAPABLE OF LOCATING A PROGRAM DECK ON A PRIMARY PROGRAM TAPE, LOADING THE PROGRAM, LOCATING A DECK OF PATCH CARDS ON A SECONDARY UNIT, AND LOADING THE PATCH CARDS. THE EXPANDED LOAD PROGRAM WILL OCCUPY THE UPPER 3000 POSITIONS OF MEMORY AND THE LOWER 380 POSITIONS. IF THE INPUT IS FROM TAPE, THE PROCESSING WILL BE OVERLAPPED BY THE READING OF THE NEXT PROGRAM CARD. EXPANDED LOAD PROGRAM /UL7080/ UL7080 PROVIDES FOR LOADING INFORMATION BETWEEN MEMORY POSITIONS 000240 AND 156799 ON A 160K 7080 OR BETWEEN 000240 AND 076799 ON AN 80K7080. OTHERWISE, THIS PROGRAM IS THE SAME AS EL7080. LOAD PROGRAM /LD7080/ THE LOAD PROGRAM FOR THE 7080 WILL PERFORM THE FOLLOWING FUNCTIONS: 1. CLEAR MEMORY FROM 0240 TO THE END OF MEMORY. 2. CLEAR THE CONTENTS OF BANKS 1, 2, 3, AND 4. 3. SET UP INTERRUPT WORDS 200, 210, 220, 230, 250, 251, 252, AND 253 SC AS TO PREVENT THE MACHINE FROM HANGING FOLLOWING THE LOADING OPERATION DUE TO AN UNANSWERED INTERRUPT SIGNAL. 4. MODIFY ITSELF TO LOAD AN OBJECT PROGRAM FROM ANY CARD READER OR CHANNEL TAPE. 5. LOAD AN OBJECT PROGRAM INTO AN 80K OR A 160K 7080. MEMORY PRINT PROGRAM /MP7080/ THE MEMORY PRINT PROGRAM FOR THE 7080 WILL BE CAPABLE OF PRINTING THE CONTENTS OF BANKS 0 THROUGH 3, THE SETTINGS OF THE ALTERATION SWITCHES, AND MEMORY FROM POSITIONS 500 THROUGH 159999. MEMORY AREAS MAY BE DEFINED AS CONSTANT, INSTRUCTION, AND/OR BIT SWITCH AREAS. THE CONSTANT AND INSTRUCTION AREAS WILL BE SORTED SEQUENTIALLY. STATEMENT MEMORY WILL BE PRINTED SEQUENTIALLY BY MEMORY POSITION AND NOT BY THE ORDER OF THE PARAMETERS ON THE CONTROL CARDS. DATA PRINT /DP7080/ THE DATA PRINT PROGRAM FOR THE 7080 PROVIDES FOR WRITING RECORDS IN FOUR OUTPUT FORMATS. THE TWO OPTIONS THAT EFFECT THE FORMAT ARE 1. INDEXING THE INDEXING OPTION PROVIDES FOR BREAKING EACH DATA RECORD INTO ONE HUNDRED OR FEWER CHARACTER SEGMENTS AND THE CREATING EACH SEGMENT AS TEN GROUPS OF TEN CHARACTERS TO THE LINE. 2. REFERENCING THE REFERENCING OPTION PROVIDES FOR TWO FUNCTIONS. A. ADDITIONAL OUTPUT INFORMATION--WHEN THE REFERENCING OPTION IS USED, A LINE OF PRINT WILL BE PRINTED BEFORE EACH TAPE RECORD IS PROCESSED. THIS LINE OF INFORMATION INDICATES THE TAPE RECORD NUMBER, THE ACTUAL LENGTH OF THE TAPE RECORD, AND OTHER INFORMATION WHICH WAS INDICATED BY THE EXTERNAL MODIFICATION CARD AND/OR INDICATED BY CERTAIN FIELDS IN THE TAPE RECORD. B. RECORD LENGTH CHECKING--PROVIDES FOR A LENGTH CHECK OF EACH DATA RECORD AND EACH TAPE RECORD. THE FOUR FORMATS ARE 1. A COMBINATION OF INDEXING AND REFERENCING. 2. INDEXING, BUT NO REFERENCING. 3. REFERENCING, BUT NO INDEXING. 4. NEITHER INDEXING NOR REFERENCING. PATCH CONVERSION /PC7080/ THE PATCH CONVERSION PROGRAM PROVIDES FOR THE USE OF CERTAIN MEMORIC OPERATIONS WHEN AN EXPANDED PATCH CARD IS BEING PUNCHED. DATA CONVERSION /DC7080/ THE DATA CONVERSION PROGRAM WILL ALLOW THE USER TO TAKE RECORDS OF ANY FORMAT AND CONVERT THEM TO ANY OTHER FORMAT. THERE IS PROVISION FOR LABELING UNLABELED FILES, BLOCKING UNBLOCKED RECORDS, REBLOCKING BLOCKED RECORDS, DEBLOCKING BLOCKED RECORDS AND PUTTING IBM STANDARDS FOR VARIABLE LENGTH RECORDS ON FILES CONTAINING VARIABLE LENGTH RECORDS. MULTIFILE AND/OR MULTI REEL TAPES MAY BE CREATED AND TAPES MAY BE DUPLICATED BY DC 7080. THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES \* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.  
CARD DECK - CONDENSED PROGRAM DECK.

OPTIONAL PROGRAM MATERIAL -  
FOUR MAGNETIC TAPES) - ASSEMBLY LISTINGS.

7080-UT-129 UTILITIES PROGRAMS FOR THE  
1301 OR 2302 DISK STORAGE UNITS

ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7080-UT-129

THE 7080 UTILITY PROGRAMS CONSIST OF THREE PROGRAMS \*M  
/EACH COMPOSED OF TWO ROUTINES/ TO PERFORM CERTAIN COMMON \*M  
OPERATIONS RELATED TO THE STORAGE, RETRIEVAL, AND PRESERVA- \*M  
TION OF DATA IN AN IBM 1301 OR 2302. THE PROGRAMS ARE \*M  
DESIGNED TO BE USED INDEPENDENTLY OR WITH THE TESTING AND \*M  
OPERATING SYSTEM /TOPS/. THE THREE PROGRAMS PROVIDED ARE- \*M

1. DK7080  
A/ FORMAT TRACK GENERATOR FOR HOME ADDRESS \*M  
B/ RECORD ADDRESS GENERATOR \*M
2. DK7081  
A/ DUMP DISK \*M  
B/ RESTORE DISK \*M
3. DK7082  
A/ LOAD DISK \*M  
B/ CLEAR DISK \*M

THE FORMAT TRACK GENERATION ROUTINE WILL GENERATE FROM SPECIFICATIONS IN CONTROL CARDS, CHARACTERS FOR A FORMAT TRACK AND WILL WRITE THEM ON ONE OR MORE FORMAT TRACKS.

THE HOME ADDRESS AND RECORD ADDRESS GENERATION ROUTINE WILL GENERATE FROM SPECIFICATIONS PROVIDED IN CONTROL CARDS, HOME ADDRESS IDENTIFIERS AND RECORD ADDRESSES AND WILL WRITE THEM ON ONE OR MORE TRACKS.

THE DUMP DISK ROUTINE WILL WRITE ALL OF THE DATA IN AN AREA OF DISK STORAGE, DESIGNATED BY CONTROL CARDS, ONTO MAGNETIC TAPE.

THE RESTORE DISK ROUTINE WILL RETURN DATA WRITTEN ON MAGNETIC TAPE BY THE DUMP DISK ROUTINE TO THE DISK STORAGE LOCATIONS FROM WHICH IT WAS UNLOADED.

THE LOAD DISK ROUTINE WILL LOAD THE DATA CONTAINED IN TAPE RECORDS GENERATED BY THE USER INTO AN AREA OF DISK STORAGE DESIGNATED BY CONTROL CARDS.

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THE CLEAR DISK ROUTINE WILL FILL RECORD AREAS ON ANY NUMBER OF TRACKS WITH A NUMERIC, ALPHABETIC, OR SPECIAL CHARACTER SPECIFIED IN CONTROL CARDS.

THE 7080 UTILITY PROGRAMS REQUIRE AN 80K 7080 SYSTEM WITH A 7908 DATA CHANNEL, ONE 1301 OR 2302 DISK STORAGE UNIT WITH 7631 FILE CONTROL, OR ONE 729 II, IV, V, OR VI MAGNETIC TAPE UNIT, ONE 714 OR 7502 CONSOLE CARD READER, /A MAGNETIC TAPE UNIT CAN BE SUBSTITUTED FOR THE CARD READER, /- THE DUMP DISK, RESTORE DISK AND LOAD DISK REQUIRE, AN ADDITIONAL 729 II, IV, V, OR VI MAGNETIC TAPE UNIT.

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL PROGRAM MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL - PROGRAM MATERIAL LIST...FLOW CHARTS...STORAGE MAPS...SAMPLE PROBLEM...REFERENCE MANUAL.

MACHINE READABLE - PROGRAM CARDS.

OPTIONAL PROGRAM MATERIAL - AUTOCODER SOURCE TAPE...LISTING TAPE.

**7080-UT-135 BANK 4 UTILITIES** \*M  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7080-UT-135

THE 7080 BANK 4 UTILITIES CONSIST OF FOUR PROGRAMS TO BE USED ON A 7080 SYSTEM WHICH HAS BANK 4 OF CENTRAL STORAGE ACTIVATED. THE PROGRAMS ARE DESIGNED TO BE USED INDEPENDENTLY OR WITH THE TESTING AND OPERATING SYSTEM /TOPS/. THE FOUR PROGRAMS PROVIDED ARE-

1. MEMORY PRINT - MP7085
2. EXPANDED LOAD - EL7085
3. UPPER LOAD - UL7085
4. BASIC LOAD - LD7080 FOR STANDARD INTERFACE MACHINES

THE MEMORY PRINT PROGRAM WILL PRODUCE, IN A FORMAT SUITABLE FOR SUBSEQUENT OFF-LINE PRINTING, A TAPE LISTING OF THE CONTENTS OF 7080 MEMORY, THE CONTENTS AND SETTINGS OF FIVE BANKS OF CENTRAL STORAGE, AND THE STATUS OF VARIOUS REGISTERS, SWITCHES, TRIGGERS, AND INDICATORS.

THE EXPANDED LOAD PROGRAM WILL LOAD CARDS OR CARD IMAGES IN STANDARD OR EXPANDED FORMAT INTO MEMORY LOCATIONS ABOVE 2379. THE PROGRAM ALSO PROVIDES FOR LOADING INTO MEMORY THE VERSION OF THE AUTOMATIC LINKAGE ROUTINE WHICH IS TO BE USED WITH MP7085.

THE UPPER LOAD PROGRAM WILL LOAD CARDS OR CARD IMAGES IN STANDARD OR EXPANDED FORMAT INTO MEMORY LOCATIONS ABOVE 2339. THE PROGRAM ALSO PROVIDES FOR LOADING INTO MEMORY THE VERSION OF THE AUTOMATIC LINKAGE ROUTINE WHICH IS TO BE USED WITH MP7085.

THE BASIC LOAD PROGRAM FOR STANDARD INTERFACE MACHINES WILL LOAD CARDS OR CARD IMAGES IN STANDARD FORMAT INTO MEMORY LOCATIONS ABOVE 2339. THE PROGRAM WILL ALSO PERFORM CERTAIN OPTIONAL HOUSEKEEPING FUNCTIONS.

THE 7080 BANK 4 UTILITIES ARE TO BE USED ON A 7080 DATA PROCESSING SYSTEM HAVING AT LEAST 80,000 POSITIONS OF MEMORY AND FIVE BANKS OF CENTRAL STORAGE, AND EQUIPPED WITH AT LEAST TWO IBM 729 II, IV, V, OR VI MAGNETIC TAPE UNITS, /A CARD READER OR 7502 CONSOLE CARD READER MAY BE SUBSTITUTED FOR ONE TAPE UNIT, /MP7085 FURTHER REQUIRES AT LEAST ONE ADDITIONAL 729 II, IV, V, OR VI MAGNETIC TAPE UNIT.

1. PROGRAM DECKS.
2. FLOW CHARTS OF EACH PROGRAM.
3. SAMPLE PROBLEM.
4. REFERENCE MATERIAL.
5. DIRECTIONS FOR RECREATING THE UTILITY TAPE USING 7080 BANK 4 UTILITIES.

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*M

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES \* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD. \*

**7080 BANK 4 UTILITIES**

DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS... LISTINGS... SAMPLE PROBLEM... FLOW CHARTS.

CARD DECKS - CONDENSED PROGRAM DECK... SAMPLE PROBLEM DECK.

OPTIONAL PROGRAM MATERIAL -

TWO MAGNETIC TAPES /ONE TAPE/ - ASSEMBLY LISTINGS... /ONE TAPE/ - SYMBOLIC CARDS ON TAPE.

**7080-UT-144 UTILITY PROGRAMS FOR THE 7340 HYPERTAPE DRIVES** \*M  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7080-UT-144

THE 7080 UTILITY PROGRAMS FOR 7340 HYPERTAPE DRIVES ARE THE TWO PROGRAMS LISTED BELOW- BASIC LOAD PROGRAM /LD7080/. THIS PROGRAM LOADS PROGRAM DATA CARDS IN CONDENSED FORMAT FROM A HYPERTAPE DRIVE INTO 7080 MEMORY. IT ALSO PERFORMS THE FOLLOWING OPTIONAL FUNCTIONS- BLANK MEMORY FROM LOCATION 00240 TO THE END OF MEMORY- CLEAR STORAGE BANKS 0-4 TO STORAGE MARKS- SET INTERRUPT WORDS IN BANK 2 OR BANK 4, OR BOTH, TO HAVE INTERRUPTS IGNORED. DATA PRINT PROGRAM /DP7081/. THIS PROGRAM LISTS THE CONTENTS OF ANY 7340 HYPERTAPE OR 729 MAGNETIC TAPE ON ANOTHER 729 MAGNETIC TAPE IN A SUITABLE FORMAT FOR OFF-LINE PRINTING. THE BASIC LOAD PROGRAM LOADS PROGRAM DATA INTO AN IBM 7080 DATA PROCESSING SYSTEM HAVING 80,000 OR 160,000 POSITIONS OF MEMORY AND EQUIPPED WITH A 7908 DATA CHANNEL TO WHICH A 7340 HYPERTAPE DRIVE AND 7640 HYPERTAPE CONTROL ARE ATTACHED. THE DATA PRINT PROGRAM REQUIRES- AN IBM 7080 DATA PROCESSING SYSTEM HAVING 80,000 OR 160,000 POSITIONS OF MEMORY AND -- IF THE INPUT TAPE IS HYPERTAPE -- EQUIPPED WITH A 7908 DATA CHANNEL, 1 IBM 729 II, IV, V, OR VI MAGNETIC TAPE UNIT FROM WHICH THE DATA PRINT PROGRAM IS LOADED, 1 IBM 7501 CONSOLE CARD READER FROM WHICH CONTROL CARDS ARE READ, /THE TAPE CONTAINING THE DATA PRINT PROGRAM OR ANOTHER 729 MAGNETIC TAPE UNIT MAY BE SUBSTITUTED FOR THE CARD READER, / 1 IBM 279 II, IV, V, OR VI MAGNETIC TAPE UNIT FOR OUTPUT TAPES, EITHER 1 IBM 7340 HYPERTAPE DRIVE AND 7640 HYPERTAPE CONTROL, OR 1 IBM 729 II, IV, V, OR VI MAGNETIC TAPE UNIT FOR INPUT TAPES.

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*M

REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES \* PROVIDED MUST BE 2400 FEET IN LENGTH. OPTIONAL MATERIAL REQUESTED MUST

CONTINUED FROM PRIOR COLUMN--  
BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS... FLOW CHARTS... SAMPLE PROBLEM.

CARD DECKS - CONDENSED PROGRAM DECK.

OPTIONAL PROGRAM MATERIAL -

TWO MAGNETIC TAPES - /ONE TAPE/ - SYMBOLIC CARDS ON TAPE.

/ONE TAPE/ - ASSEMBLY LISTINGS.

## 7740

**7740-CX-09X IBM SCIENTIFIC TERMINAL SYSTEM FOR SERVICING 1050 TERMINALS** \*N  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7740-CX-09X

THE SCIENTIFIC TERMINAL SYSTEM IS A NEW REMOTE COMPUTING CAPABILITY FOR THE 7090-7040 DIRECT COUPLE SYSTEM /DCS/. IT PROVIDES THE FULL FACILITY OF A CENTRALLY LOCATED DIRECT COUPLE SYSTEM TO USERS AT REMOTE LOCATIONS. THE DIRECT COUPLE OPERATING SYSTEM TYPE I SUPPORT MUST BE USED. THIS NEW DIMENSION IN REMOTE COMPUTING -- THIS NEW CONCEPT ENHANCES USE OF THE 7090-7040 DCS, FACILITATING SIMULTANEOUS TERMINAL AND NORMAL COMPUTER CENTER OPERATIONS.

STS PROVIDES IMPROVED SUPPORT IN THE FOLLOWING INDUSTRY AREAS IN WHICH 7090-7040 DCS IS USED.

- RESEARCH AND DEVELOPMENT LABORATORIES
  - UNIVERSITY COMPUTING CENTERS
  - LARGE SCALE DEFENSE INSTALLATIONS
  - AEROSPACE COMPANIES
  - MANUFACTURING COMPANIES
  - PROCESS INDUSTRIES
  - COMPUTING SERVICE OPERATIONS
- A REMOTE TERMINAL SYSTEM OF THIS TYPE CAN OFFER CONSIDERABLE IMPROVEMENTS IN THE TURNAROUND TIME BETWEEN THE USER AND A CENTRAL COMPUTING SYSTEM BY COMPRESSING DISTANCE AND TIME WITH COMMUNICATION LINES AND POWERFUL COMMUNICATION CONTROL SYSTEMS. STS PERFORMS THIS COMPRESSION BY ALLOWING 1050 DATA COMMUNICATION SYSTEM AND 1974-II DATA TRANSMISSION PROCESSED TERMINALS TO ACT AS INPUT TO THE OUTPUT OF THE 7090-7040 DIRECT COUPLE SYSTEM AND HAVE FULL USE OF THE DIRECT COUPLE OPERATING SYSTEM /DCOS/. STS IS A JOB MODE SYSTEM IN WHICH A PROGRAM STORED IN THE IBM 7740 RELIEVES THE CENTRAL COMPUTER OF ALL LINE HANDLING, JOB BATCHING, AND INPUT/OUTPUT ERROR DETECTION. CARD READING AT 1050 TERMINALS IS LIMITED TO BCD CARDS ONLY WITH OUTPUT ON 1052 PRINTER-KEYBOARD.

FEATURES ARE-

- ATTACKS THE PROBLEM OF JOB TURNAROUND TIME.
- INCREASES IN OPERATING EFFICIENCY THROUGH 7740 EDIT AND BATCHING CAPABILITIES
- INDEPENDENCE BETWEEN DIRECT COUPLE OPERATING SYSTEM AND MECHANICS OF SERVICING MANY COMMUNICATION LINES.
- AUTOMATIC ROUTING RESOLVES AT USERS' DISCRETION.
- HIGH SPEED BINARY AND BCD INPUT AND OUTPUT USING THE 1974-II TERMINAL.

THE STS WORKS WITH THE DIRECT COUPLE OPERATING SYSTEM /DCOS/ IN SUPPORT OF THE 7090-7040 DIRECT COUPLE SYSTEM /DCS/. AN INTERFACE IN THE FORM OF MODIFICATIONS TO THE DIRECT COUPLE OPERATING SYSTEM /7090-161/ WILL BE INCLUDED IN THE STS. THE STS PROGRAM IN THE 7740 COLLECTS INPUT JOBS FROM TERMINALS ON ITS 1311 FILE. COMPLETE JOBS ARE TRANSMITTED TO THE DCS FOR ENTRY INTO ITS JOB QUEUE. JOB OUTPUT IS SIMILARLY HANDLED.

PROGRAMMING SYSTEMS- THE CENTRAL PROGRAM IN STS, WHICH RESIDES IN THE 7740, REQUIRES LOCAL ASSEMBLY ON A 1401 USING 1401-SP-156 TO TAILOR THE PROGRAM TO THE INSTALLATION LINE AND TERMINAL CONFIGURATION. ASSEMBLY OF THE OTHER TWO PORTIONS, RESIDING IN THE 1974-II AND THE 7040/44, IS NOT NORMALLY REQUIRED. THE 1974-II PORTION CAN BE ASSEMBLED UNDER 1401-AU-008 WITH SPECIAL MNEMONICS. THE 7040/44 PORTION IS A MODIFICATION TO PROGRAM DCMP OF THE 7090-7040 DIRECT COUPLE OPERATING SYSTEM /7090-PR-161/ VERSION 1 MODIFICATION LEVEL 2 CODED IN 7090/94 IBM LANGUAGE. ASSEMBLY REQUIRES 18 JOBS AS CONTAINED IN DCOS, OR 1855 PROCESSOR OPERATING SYSTEM /7090-PR-130 VERSION 12/.

MINIMUM 7740 SYSTEM REQUIREMENTS- A 16K 7741 MODEL 3 WITH DISK STORAGE ADAPTER /NO. 3309/, SCAN AND LOCATE SECTOR /NO. 6395/, AND RPQ W10994, ATTACHED TO 7040/44 SYSTEM ON A 7904 DATA CHANNEL WITH CONTROL ADAPTER /NO. 1074/... A 1311 DISK STORAGE DRIVE MODEL 5 WITH SCAN DISK /NO. 6396/... A 1051 CONTROL UNIT MODEL 1 WITH FIRST PRINTER /NO. 4408/, FIRST READER /NO. 4411/, AND HOME COMPONENT RECOGNITION /NO. 4605/... 1052 PRINTER-KEYBOARD MODEL 1 WITH PROCESSOR PRINTING ELEMENT /NO. 9579/ /SET H/, AND 12 CHARACTERS/INCH SPACING, /NO. 9105/, 1056 CARD READER MODEL 1 WITH EXTENDED CHARACTER READING /NO. 3861/, TO USE 1050 TERMINALS ONE DATA SET ADAPTER /NO. 1076/ PER FOUR LOW SPEED LINES, A SECOND LOW SPEED GROUP WITH REQUIRED DATA SET ADAPTERS /NO. 1077/ IS REQUIRED IF MORE THAN 28 LOW SPEED LINES ARE ATTACHED... TO USE 1974-II TERMINALS A HIGH SPEED ADAPTER /NO. 4588 FOR THE FIRST AND NO. 4589 FOR THE SECOND/ FOR HIGH SPEED HALF-DUPLEX LINE.

1050 TERMINALS- 1051 CONTROL UNIT MODEL 1 WITH FIRST READER /NO. 4411/ AND FIRST PRINTER /NO. 4408/, AUTOMATIC RIBBON SHIFT AND LINE FEED SELECT /NO. 1295/ AND DATA SET ATTACHMENT OR LINE ADAPTER /NO. 4790/, 1052 PRINTER-KEYBOARD MODEL 1 WITH PROCESSOR PRINTING ELEMENT /NO. 9579/ /SET H/, AND 12 CHARACTERS/INCH SPACING /NO. 9105/, 1056 CARD READER MODEL 1 WITH EXTENDED CHARACTER READING /NO. 3861/. OPTIONAL FEATURES WHICH SHOULD BE CONSIDERED FOR 1050 TERMINALS ARE- AUTOMATIC EOB /NO. 1313/, KEYBOARD REQUEST /NO. 4770/, LINE CORRECTION /NO. 4795/, 13-1/8 INCH PIN FEED PLATEN /NO. 9509/, AND RED/BLACK RIBBON.

NOTE- IT SHOULD BE EMPHASIZED THAT STS IS DEPENDENT UPON DCOS VERSION 1, MODIFICATION LEVEL 2, FOR ITS OPERATION. IF THERE ARE FUTURE VERSIONS OR MODIFICATION LEVELS OF DCOS THEN IT IS POSSIBLE THAT MODIFICATIONS WOULD HAVE TO BE MADE TO ADAPT THE STS SYSTEM TO THE NEW DCOS VERSION. ADEQUATE TIME BEFORE EQUIPMENT INSTALLATION SHOULD BE ALLOCATED SO THAT SUCH MODIFICATIONS AS NECESSARY MAY BE MADE.

OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH.

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CONTINUED FROM PRIOR COLUMN--

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP...APPLICATION DIRECTORY...  
APPLICATION DESCRIPTION...TERMINAL USERS MANUAL-1050...  
SYSTEM PROGRAMMERS MANUAL...OPERATORS GUIDE...SYSTEMS  
MANUAL.  
MACHINE READABLE - ONE REEL OF MAGNETIC TAPE CONTAINING THE  
7740 SYMBOLIC PROGRAM, 7040 SYMBOLIC PROGRAM AND A  
SAMPLE PROBLEM.

OPTIONAL PROGRAM MATERIAL - ONE REEL OF MAGNETIC TAPE CONTAINING  
PROGRAM FLOWCHARTS.

7740-CX-10X IBM SCIENTIFIC TERMINAL  
SYSTEM FOR SERVICING 1050 AND 1974-II TERMINALS  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7740-CX-10X

THE SCIENTIFIC TERMINAL SYSTEM IS A NEW REMOTE COMPUTING  
CAPABILITY FOR THE 7090-7040 DIRECT COUPLE SYSTEM /DCS/. IT  
PROVIDES THE FULL FACILITY OF A CENTRALLY LOCATED DIRECT COUPLE  
SYSTEM TO USERS AT REMOTE LOCATIONS. THE DIRECT COUPLE OPERATING  
SYSTEM TYPE SUPPORT MUST BE USED. THIS NEW DIMENSION IN REMOTE  
COMPUTING - THIS NEW CONCEPT ENHANCES USE OF THE 7090-7040 DCS,  
FACILITATING SIMULTANEOUS TERMINAL AND NORMAL COMPUTER CENTER  
OPERATIONS.

STS PROVIDES IMPROVED SUPPORT IN THE FOLLOWING INDUSTRY AREAS IN  
WHICH 7090-7040 DCS IS USED.

RESEARCH AND DEVELOPMENT LABORATORIES  
UNIVERSITY COMPUTING CENTERS  
LARGE SCALE DEFENSE INSTALLATIONS  
AEROSPACE COMPANIES  
MANUFACTURING COMPANIES  
PROCESS INDUSTRIES  
COMPUTING SERVICE OPERATIONS

A REMOTE TERMINAL SYSTEM OF THIS TYPE CAN OFFER CONSIDERABLE  
IMPROVEMENTS IN THE TURNAROUND TIME BETWEEN THE USER AND A  
CENTRAL COMPUTING SYSTEM BY COMPRESSING DISTANCE AND TIME WITH  
COMMUNICATION LINES AND POWERFUL COMMUNICATION CONTROL SYSTEM.  
STS PERFORMS THIS COMPRESSION BY ALLOWING 1050 DATA COMMUNICATION  
SYSTEM AND 1974-II DATA TRANSMISSION PROCESSOR TERMINALS TO ACT  
AS INPUT AND OUTPUT DEVICES TO THE 7090-7040 DIRECT COUPLE SYSTEM  
AND HAVE FULL USE OF THE DIRECT COUPLE OPERATING SYSTEM /DCOS/.  
STS IS A JOB MODE SYSTEM IN WHICH A PROGRAM STORED IN THE IBM  
7740 RELIEVES THE CENTRAL COMPUTER OF ALL LINE HANDLING, JOB  
BATCHING, AND INPUT/OUTPUT ERROR DETECTION. CARD READING AT 1050  
TERMINALS IS LIMITED TO BCD CARDS ONLY WITH OUTPUT ON 1052  
PRINTER-KEYBOARD. 1974-II TERMINALS ALLOW BOTH BINARY AND BCD  
CARD INPUT/OUTPUT AS WELL AS PRINTED OUTPUT ON THE 1980-7  
PRINTER.

FEATURES ARE-

ATTACKS THE PROBLEM OF JOB TURNAROUND TIME.  
INCREASE IN OPERATING EFFICIENCY THROUGH 7740 EDIT AND BATCHING  
CAPABILITIES.

INDEPENDENCE BETWEEN DIRECT COUPLE OPERATING SYSTEM AND  
MECHANICS OF SERVICING MANY COMMUNICATION LINES.

AUTOMATIC ROUTING OF COMPUTED RESULTS AT USERS DISCRETION.  
HIGH SPEED BINARY AND BCD INPUT AND OUTPUT USING THE 1974-II  
TERMINAL.

THE STS WORKS WITH THE DIRECT COUPLE OPERATING SYSTEM /DCOS/ IN  
SUPPORT OF THE 7090-7040 DIRECT COUPLE SYSTEM /DCS/. AN  
INTERFACE IN THE FORM OF MODIFICATIONS TO THE DIRECT COUPLE  
OPERATING SYSTEM /7090-PR-161, VIL2/ IS INCLUDED IN THE STS. THE  
STS PROGRAM IN THE 7740 COLLECTS INPUT JOBS FROM TERMINALS ON IIS  
1311 FILE. COMPLETE JOBS ARE TRANSMITTED TO THE DCS FOR ENTRY  
INTO ITS JOB QUEUE. INPUT IS SIMILARLY HANDLED.

PROGRAMMING SYSTEMS- THE CENTRAL PROGRAM IN STS, WHICH RESIDES IN  
THE 7740, REQUIRES LOCAL ASSEMBLY ON A 1401 USING 1401-SP-156 TO  
TAILOR THE PROGRAM TO THE INSTALLATION LINE AND TERMINAL  
CONFIGURATION. ASSEMBLY OF THE OTHER TWO PORTIONS, RESIDING IN  
THE 1974-II AND THE 7040/44, IS NOT NORMALLY REQUIRED. THE  
1974-II PORTION CAN BE ASSEMBLED UNDER 1401-AU-008 WITH SPECIAL  
MNEMONICS. THE 7040/44 PORTION IS A MODIFICATION TO PROGRAM  
DCMUP OF THE 7090-7040 DIRECT COUPLE OPERATING SYSTEM

/7090-PR-161/ VERSION 1 MODIFICATION LEVEL 2 CODED IN 7090/94  
IBMAP LANGUAGE. ASSEMBLY REQUIRES 18JOB AS CONTAINED IN DCOS, OR  
IBSYS PROCESSOR OPERATING SYSTEM /7090-PR-130 VERSION 12/.

MINIMUM 7740 SYSTEM REQUIREMENTS- A 16K 7741 MODEL 3 WITH DISK  
STORAGE ADAPTER /NO. 3309/, SCAN AND LOCATE SECTOR /NO. 6395/,  
AND RPO 10994. ATTACH TO 7040/44 SYSTEM ON A 7904 DATA  
CHANNEL WITH CONTROL ADAPTER /NO. 1074/... A 1311 DISK STORAGE  
DRIVE MODEL 5 WITH SCAN DISK /NO. 6396/... A 1051 CONTROL UNIT  
MODEL 1 WITH FIRST PRINTER /NO. 4408/, FIRST READER /NO. 4411/,  
AND HOME COMPONENT RECOGNITION /NO. 4605/... 1052 PRINTER-KEYBOARD  
MODEL 1 WITH PROCESSOR PRINTING ELEMENT /NO. 9579/ /SET H/, AND  
12 CHARACTERS/INCH SPACING, /NO. 9105/... 1056 CARD READER MODEL 1  
WITH EXTENDED CHARACTER READING /NO. 3861/... TO USE 1050

TERMINALS ONE DATA SET ADAPTER /NO. 1076/ PER FOUR LOW SPEED  
LINES, A SECOND LOW SPEED GROUP WITH REQUIRED DATA SET ADAPTERS  
/NO. 1077/ IS REQUIRED IF MORE THAN 28 LOW SPEED LINES ARE  
ATTACHED... TO USE 1974-II TERMINALS A HIGH SPEED ADAPTER  
/NO. 4588 FOR THE FIRST AND NO. 4589 FOR THE SECOND/ FOR HIGH  
SPEED HALF-DUPLEX LINE. 1050 TERMINALS- 1051 CONTROL UNIT MODEL  
1 WITH FIRST READER /NO. 4411/ AND FIRST PRINTER /NO. 4408/,  
AUTOMATIC RIBBON SHIFT AND LINE FEED SELECT /NO. 1295/ AND DATA  
SET ATTACHMENT OR LINE ADAPTER /NO. 4790/... 1052 PRINTER-KEYBOARD  
MODEL 1 WITH PROCESSOR PRINTING ELEMENT /NO. 9579/ /SET H/, AND  
12 CHARACTERS/INCH SPACING /NO. 9105/... 1056 CARD READER MODEL 1  
WITH EXTENDED CHARACTER READING /NO. 3861/. OPTIONAL FEATURES

WHICH SHOULD BE CONSIDERED FOR 1050 TERMINALS ARE- AUTOMATIC EOB  
/NO. 1313/, KEYBOARD REQUEST /NO. 4770/, LINE CORRECTION  
/NO. 4795/, 1/8 INCH PAPER FEED /NO. 9509/, AND RED/BLACK  
RIBBON. 1974-II TERMINALS- 1974-II DATA TRANSMISSION PROCESSOR  
TERMINAL /RPO 810248/ WITH THE CARD IMAGE SPECIAL FEATURE AND RPO  
843042., 1980-7 PRINTER WITH SELECTIVE CHARACTER SET /H-52  
CHARACTERS/... 1442 CARD READ PUNCH MODEL 1 OR 2 WITH RPO 843042.  
NOTE- IT SHOULD BE EMPHASIZED THAT STS IS DEPENDENT UPON DCOS  
VERSION 1, MODIFICATION LEVEL 2, FOR ITS OPERATION. IF THERE ARE  
FUTURE VERSIONS OR MODIFICATIONS OF DCOS THEN IT IS  
POSSIBLE THAT MODIFICATIONS WOULD HAVE TO BE MADE TO ADAPT THE  
STS SYSTEM TO THE NEW DCOS VERSION. ADEQUATE TIME BEFORE  
EQUIPMENT INSTALLATION SHOULD BE ALLOCATED SO THAT SUCH  
MODIFICATIONS, AS NECESSARY MAY BE MADE.

OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.  
THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM  
REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE  
TAPES PROVIDED MUST BE 2400 FEET IN LENGTH.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP...APPLICATION DIRECTORY...  
APPLICATION DESCRIPTION...TERMINAL USERS MANUAL-1050...  
SYSTEM PROGRAMMERS MANUAL...OPERATORS GUIDE...SYSTEMS  
MANUAL...TERMINAL USERS MANUAL-1974-II.

MACHINE READABLE - ONE REEL OF MAGNETIC TAPE CONTAINING THE  
7740 SYMBOLIC PROGRAM, 7040 SYMBOLIC PROGRAM, 1974-II  
SYMBOLIC PROGRAM, 1974-II OBJECT PROGRAM AND A SAMPLE  
PROBLEM.

OPTIONAL PROGRAM MATERIAL - A CARD DECK OF MNEMONIC OP CODES TO  
UPDATE 1401-AU-008 AUTOCODER FOR 1974-II ASSEMBLIES...ONE  
REEL OF MAGNETIC TAPE CONTAINING PROGRAM FLOWCHARTS.

7740-SV-160 COMMUNICATIONS CONTROL  
PACKAGE

ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7740-SV-160

\*R

NUMBER 7740-SV-160, IS NOW AVAILABLE TO USERS OF 7740 SYSTEMS  
USING TWO 1311 DISK STORAGE DRIVES. IT HAS THE FEATURES  
PREVIOUSLY ANNOUNCED, INCLUDING THE OPTION TO ATTACH A 1400 OR  
7000 SERIES SYSTEM.

FEATURES- THE MODULAR DESIGN OF THE COMMUNICATION CONTROL PACKAGE  
ENABLES THE USER TO ADD, SUBSTITUTE, OR ALTER SECTIONS OF THE  
PROGRAM, THUS TAILORING THE PACKAGE TO HIS SPECIFIC NEED. IT IS  
ASSEMBLED ON THE 1401 USING THE 7740 ASSEMBLY PROGRAM, NUMBER  
1401-SP-156. VERSION 1 INCLUDES PROGRAMS THAT-

- QUEUE MESSAGES ON DISK
- CONTROL TRANSMISSION LINES AND TERMINALS
- HANDLE A MIX OF TERMINAL TYPES WITH A MIX OF TRANSMISSION CODES
- ROUTE MESSAGES TO VALID DESTINATIONS SPECIFIED IN THE MESSAGE  
HEADER
- PROVIDE DIAGNOSTIC AIDS AND SYSTEMS AWARENESS ROUTINES
- FACILITATE MESSAGE RETRIEVAL AND THE PROTECTION OF MESSAGES  
FROM LOSS OR ERROR

- HANDLE UNDELIVERABLE MESSAGES
- REPORT NETWORK STATUS TO OPERATOR
- PROVIDE 7740 COMMUNICATIONS WITH AN ATTACHED 1400 OR 7000  
SERIES SYSTEM
- TAKE SYSTEM CHECK POINTS ON A 1311 DISK STORAGE DRIVE TO  
PROVIDE FOR SYSTEM RESTART

VERSION 2 OF THE 7740 COMMUNICATION CONTROL PACKAGE CONTAINS  
ALL THE FEATURES OF VERSION 1 PLUS THE ADDED CAPABILITIES FOR  
ONE TO FIVE 1311 DISK STORAGE DRIVES, OR A 7740 SYSTEM WITHOUT  
DISK BUT WITH AN ATTACHED 1400 OR 7000 SERIES SYSTEM.  
ALTHOUGH VERSION 2 IS IDENTIFIED BY A SINGLE PROGRAM NUMBER, IT  
CONSISTS OF EITHER A BASIC PACKAGE FOR DISK ORIENTED SYSTEMS OR  
AN OPTIONAL PACKAGE FOR HOST ORIENTED SYSTEMS. ONLY THE BASIC OR  
OPTIONAL PROGRAM MATERIAL NEED BE ORDERED FOR ANY SYSTEM.

INCLUDES PROGRAMS THAT-

- CONTROL TRANSMISSION LINES AND TERMINALS
- HANDLE A MIX OF TERMINAL TYPES WITH A MIX OF TRANSMISSION CODES
- PROVIDE DIAGNOSTIC AIDS AND SYSTEMS AWARENESS ROUTINES
- FACILITATE THE PROTECTION OF MESSAGES FROM LOSS OR ERROR
- REPORT NETWORK STATUS TO OPERATOR
- PROVIDE 7740 COMMUNICATIONS WITH AN ATTACHED 1400 OR 7000  
SERIES SYSTEM

- QUEUE MESSAGES ON DISK
- ROUTE MESSAGES TO VALID DESTINATIONS SPECIFIED IN THE MESSAGE  
HEADER
- FACILITATE MESSAGE RETRIEVAL
- HANDLE UNDELIVERABLE MESSAGES

- TAKE SYSTEM CHECK POINTS ON A 1311 DISK STORAGE DRIVE TO  
PROVIDE FOR SYSTEM RESTART

THE OPTIONAL PACKAGE FOR 7740 SYSTEMS WITHOUT DISK, BUT WITH AN  
ATTACHED 1400 OR 7000 SERIES SYSTEM INCLUDES PROGRAMS THAT-

- CONTROL TRANSMISSION LINES AND TERMINALS
- HANDLE A MIX OF TERMINAL TYPES WITH A MIX OF TRANSMISSION CODES
- PROVIDE DIAGNOSTIC AIDS AND SYSTEMS AWARENESS ROUTINES
- FACILITATE THE PROTECTION OF MESSAGES FROM LOSS OR ERROR
- REPORT NETWORK STATUS TO OPERATOR
- PROVIDE 7740 COMMUNICATIONS WITH AN ATTACHED 1400 OR 7000  
SERIES SYSTEM

- TRANSFER INCOMING MESSAGES TO AN ATTACHED 1400 OR 7000 SERIES  
SYSTEM FOR PROCESSING
- RECEIVE MESSAGES FROM AN ATTACHED 1400 OR 7000 SERIES SYSTEM  
FOR TRANSMISSION
- RETURN UNDELIVERABLE MESSAGES TO THE ATTACHED DATA PROCESSING  
SYSTEM

THE MODULAR DESIGN OF THE COMMUNICATION CONTROL PACKAGE ENABLES  
THE USER TO ADD, SUBSTITUTE, OR ALTER SECTIONS OF ANY PROGRAM,  
THUS TAILORING THE PACKAGE TO HIS SPECIFIC NEED. IT IS ASSEMBLED  
ON THE 1401 USING THE 7740 ASSEMBLY PROGRAM, NO. 1401-SP-156.

SYSTEM REQUIREMENTS-

MINIMUM- AN 8152 WORD 7740 COMMUNICATION CONTROL SYSTEM...  
1050 DATA COMMUNICATION SYSTEM AS A CONSOLE... 1311 DISK STORAGE  
DRIVE, /DISK ORIENTED SYSTEM/ OR A 1400 OR 7000 SERIES  
SYSTEM USED AS A HOST COMPUTER /HOST ORIENTED SYSTEM/.

OPTIONAL- A 16,384 WORD 7740 COMMUNICATION CONTROL SYSTEM...  
ADDITIONAL 1050 DATA COMMUNICATION SYSTEM USED AS REMOTE  
TERMINALS... TELEGRAPH TERMINALS OPERATING OVER HALF-DUPLEX OR  
FULL-DUPLEX LINES USING 5-LEVEL BAUDOT CODE... AN ATTACHED  
1400 OR 7000 SERIES SYSTEM /HOST COMPUTER/ USED AS A TERMINAL IN  
CONJUNCTION WITH AS MANY AS FIVE 1311 DISK STORAGE DRIVES. THE  
COMMUNICATION BETWEEN THE HOST COMPUTER AND THE 7740 IS EFFECTED  
BY USING THE APPROPRIATE HOST COMPUTER IOCS.

THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM  
REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE  
TAPES PROVIDED MUST BE 2400 FEET IN LENGTH.  
OPTIONAL MATERIAL REQUESTED MUST BE ITEMIZED ON THE ORDER CARD.

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... REFERENCE MANUAL.  
MAGNETIC TAPE - TWO REELS /1/ CCP SOURCE TAPE FOR DISK  
ORIENTED SYSTEM... /2/ CCP ASSEMBLY LISTING AND FLOW  
CHARTS.

OPTIONAL PROGRAM MATERIAL - ONE REEL - CCP SOURCE TAPE FOR HOST  
ORIENTED SYSTEMS... ONE REEL - CCP FLOW CHARTS AND ASSEMBLY  
LISTING FOR HOST ORIENTED SYSTEM.  
\*\*\* TWO REELS OF MAGNETIC TAPE ARE REQUIRED FOR THE BASIC OR  
OPTIONAL PROGRAM MATERIAL.

## 7750

7750-SV-139 DATA CONTROL PACKAGE  
ORDER THROUGH LOCAL IBM BRANCH OFFICE  
SPECIFY FILE NUMBER 7750-SV-139

\*M

THE 7750 DATA CONTROL PACKAGE IS DESIGNED TO CONTROL  
THE ASSEMBLY AND DISTRIBUTION OF DATA IN A TELE-PROCESSING  
NETWORK. IT IS MODULAR IN DESIGN, THUS ENABLING THE USER  
TO DELETE ANY PORTIONS OF THE SYSTEM NOT APPLICABLE TO HIS  
INSTALLATION AND TO ADD HIS OWN PROGRAMS IF HE WISHES.

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THE 7750 DATA CONTROL PACKAGE WILL OPERATE IN A 7750 WITH A MINIMUM OF 4096 WORDS OF STORAGE. IF THE SYSTEM IS USED IN A MACHINE WITH 8192 OR 16384 WORDS OF STORAGE, THE ADDITIONAL STORAGE WILL AUTOMATICALLY BE USED TO INCREASE THE BUFFER STORAGE CAPACITY OF THE SYSTEM.  
THIS PROGRAM IS ASSEMBLED ON THE 1401 USING 1401-SP-133.

\*H

BASIC PROGRAM MATERIAL -  
DOCUMENTATION - PROGRAM WRITE-UP... OPERATING INSTRUCTIONS.  
CARD DECK - LOAD CONDENSER DECK... SAMPLE PROBLEM DECK.  
ONE MAGNETIC TAPE - SYMBOLIC CARDS ON TAPE.





# Contributed Programs

B-0705

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## 0705

0705-01.1.002 SYMBOLIC ASSEMBLY FOR 1401  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-01.1.002

AUTHORS..INTERNATIONAL HARVESTER COMPANY  
SYSTEMS & DATA SERVICES  
1601 WEST 22ND STREET  
BROADVIEW, ILLINOIS

DIRECT INQUIRIES TO AUTHOR

TO ASSEMBLE 1401 PROGRAMS WRITTEN IN THE IBM SYMBOLIC  
LANGUAGE ON THE 705. THIS PROGRAM WAS WRITTEN BY E. I.  
DUPONT, AND MODIFIED FOR 754 TCU BY INTERNATIONAL  
HARVESTER.

FORMERLY FILE NUMBER IH-001-0

0705-01.2.002 ADAPT 1401 COMPILER  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-01.2.002

AUTHOR...R. G. BIZZELL  
SOUTHERN RAILWAY COMPANY  
15TH & K STREETS, N. W.  
WASHINGTON, D. C.

DIRECT INQUIRIES TO AUTHOR

A COMPILER TO GENERATE 1401 CONDENSED PROGRAMS ON THE 705,  
MODEL 11, USING EITHER 705 MACRO STATEMENTS OR A NEWLY  
DEVELOPED STATEMENT LANGUAGE. THE SDHIO 705 - 1401  
ASSEMBLY IS INCORPORATED IN THE COMPILER.

FORMERLY FILE NUMBER SR-009-0

0705-01.3.001 HQ USAF TAPE INPUT-OUTPUT  
PACKAGE  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-01.3.001

AUTHOR...HEADQUARTERS, USAF

DIRECT INQUIRIES TO..

GEORGE WIDDING, AFASC-3E-1  
DATA PROCESSING DIVISION  
HQ., USAF, WASHINGTON, D.C.

PURPOSE THIS SET OF SUB-ROUTINES AND MACRO-INSTRUCTIONS  
PROVIDES FOR COMPLETE HANDLING OF TAPE INPUT AND OUTPUT.  
THE SUB-ROUTINES ARE DESIGNED PRIMARILY TO PROCESS TAPES  
USING THE HQ USAF TAPE IDENTIFICATION SYSTEM BUT TAPES  
LACKING HEADERS AND TRAILERS MAY BE PROCESSED. THE MAJOR  
PARTS OF THE PACKAGE ARE INPUT/OUTPUT MACROS TO READ A  
TAPE, WRITE A TAPE, READ-WHILE-WRITE A TAPE, READ AND  
DEBLOCK BLOCKED RECORDS, AND BLOCK-UP AND WRITE BLOCKED  
RECORDS. A SUB-ROUTINE IDENT\* THAT PROVIDES FOR TRA  
OPERATIONS, OUTPUT TAPE LABELLING AND INPUT TAPE LABEL  
VERIFICATION. A SUB-ROUTINE /IDWCP/ THAT IN ADDITION TO  
THE IDENT FUNCTIONS INCLUDES A CHECK POINT ROUTINE, CHECK  
POINTS ARE TAKEN AUTOMATICALLY AT EOF BUT MAY BE TAKEN AT  
ANY OTHER TIME DESIRED. PROVISION IS MADE FOR PROGRAM  
INTERRUPT. A RESTART PROGRAM FOR USE WITH IDWCP. THIS IS  
A SEPARATE PROGRAM THAT ENABLES YOU TO RESTART TO ANY CHECK  
POINT TAKEN BY IDWCP. THE ROUTINE CHECKS TAPE LABELS,  
TODAY S DATA, REPOSITIONS TAPES, AND RESTORES MEMORY AND  
ASU S 01-13. SINCE THE RESTART BEGINS WITH MEMORY CLEARED  
IT IS USEFUL IN SITUATIONS WHERE LONG RUNS ARE INTERRUPTED.

FORMERLY FILE NUMBER AF-003-1

0705-01.9.001 SORT 57-BLOCKED VARIABLE  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-01.9.001

AUTHORS..THE CURTIS PUBLISHING CO.  
6TH AND WALNUT STREETS  
PHILADELPHIA 5, PENNA.

DIRECT INQUIRIES TO AUTHOR

PURPOSE TO SORT VARIABLE LENGTH RECORDS WHICH HAVE BEEN  
BLOCKED IN GROUPS OF THE SAME NUMBER OF RECORDS NOT  
EXCEEDING 1020 CHARACTERS INCLUDING TERMINAL RECORD MARK,  
OR SINGLE RECORDS NOT ENDING IN A RECORD MARK NOT EXCEEDING  
1019 CHARACTERS.

FORMERLY FILE NUMBER CU-001-0

0705-02.2.001 SORT 55  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-02.2.001

AUTHOR...G. J. BERRY  
ELI LILLY AND COMPANY  
INDIANAPOLIS 6, INDIANA

DIRECT INQUIRIES TO AUTHOR

TO PROVIDE A GENERALIZED TWO WAY MERGE SORTING PROGRAM.  
THIS SORT WILL ACCOMMODATE SINGLE OR BLOCKED RECORDS UP TO  
1900 CHARACTERS IN LENGTH AND WILL SORT ON THREE CONTROL  
FIELDS WITH UP TO 30 CHARACTERS. A SINGLE ASSIGNMENT  
ROUTINE PRECEDES THE THREE PHASE SORT OPERATION - INTERNAL  
SORT OF MAXIMUM POSSIBLE RECORDS, TWO WAY RWM MERGE, FINAL  
WRITE WITH SEQUENCE CHECK. INFORMATION FOR ASSIGNMENTS CAN  
BE PROVIDED BY SINGLE CONTROL CARDS OR BY A 705 MACRO-  
INSTRUCTION, SR T 55, WHICH WILL AUTOMATICALLY CALL FOR THE  
PROGRAM FROM THE CARD READER. EXITS ARE PROVIDED IN SORT  
55 FOR MODIFICATIONS.

CONTINUED FROM PRIOR COLUMN--

FORMERLY FILE NUMBER EY-001-0

0705-02.9.005 MOVEX  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-02.9.005

AUTHOR...ROBERT G. BIZZELL  
SOUTHERN RAILWAY SYSTEM  
OFFICE OF THE COMPTROLLER  
WASHINGTON 13, D. C.

DIRECT INQUIRIES TO AUTHOR

TO MOVE A DEFINED FIELD TO ANOTHER DEFINED FIELD.

FORMERLY FILE NUMBER SR-007-0

0705-03.1.001 CHANGE CARD LOAD  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-03.1.001

AUTHOR...HEADQUARTERS, USAF  
AFASC-3E  
WASHINGTON 25, DC

DIRECT INQUIRIES TO AUTHOR

PURPOSE TO LOAD PROGRAM CARDS INTO MEMORY IN THE SAME  
MANNER AS THE STANDARD LOWER LOAD PROGRAM. ALSO, TO ALLOW  
SPECIAL PATCH CARDS TO BE LOADED AS IF THEY WERE NORMAL  
INSTRUCTION CARDS.

FORMERLY FILE NUMBER AF-001-1

0705-03.9.001 MEMORY PUNCH OUT  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-03.9.001

AUTHOR...GEORGE WIDDING  
HEADQUARTERS USAF  
AFASC 3E  
WASHINGTON 25, DC

DIRECT INQUIRIES TO AUTHOR

PURPOSE TO PUNCH OUT PROGRAM DECKS INCORPORATING CHANGE  
CARDS TO CUT DOWN THE SIZE OF PROGRAM DECKS AND SERIAL  
NUMBER CARDS IN THE DECK. THIS REMOVES THE DANGER OF  
CHANGE CARDS GETTING OUT OF SEQUENCE. IT HAS AN ADVANTAGE  
OVER IBM S PUNCH MEMORY 51 UTILITY PROGRAM IN THAT CONTROL  
CARDS NEED NOT BE MADE TO DESIGNATE MEMORY TO BE PUNCHED.  
IT WILL ALSO PUNCH OUT A GREATER PORTION OF MEMORY THAN  
PUNCH MEMORY 51.

FORMERLY FILE NUMBER AF 002-0

0705-04.2.001 PRINT I TRACING ROUTINE  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-04.2.001

AUTHOR...W. R. BRITTENHAM  
A. O. SMITH CORPORATION  
EDP SYSTEMS  
3533 N. 27TH ST.  
MILWAUKEE 1, WISCONSIN

DIRECT INQUIRIES TO AUTHOR

PURPOSE TO FUNCTION AS A DEBUGGING AID IN CASES WHERE  
DEBUGGING BY MEMORY PRINT FAILS. THE ROUTINE LISTS EACH  
PRINT I STEP EXECUTED, ALONG WITH NUMERICAL VALUES OF THE  
OPERANDS AND RESULTS, IF ANY.

FORMERLY FILE NUMBER AC-001-0

0705-04.2.002 ABBREVIATED PRINT I TRACING  
ROUTINE

AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-04.2.002

AUTHORS..W. R. BRITTENHAM GEORGE KUSS

DIRECT INQUIRIES TO..

W. R. BRITTENHAM  
A. O. SMITH CORPORATION  
EDP SYSTEMS  
3533 N. 27TH ST.  
MILWAUKEE 1, WISCONSIN

PURPOSE TO FUNCTION AS A DEBUGGING AID IN CASES WHERE THE  
AMOUNT OF MEMORY AVAILABLE FOR A TRACING ROUTINE IS SMALL.  
BAD D AND PAC1 ARE LISTED FOR EACH PRINT I PROGRAM STEP  
EXECUTED.

FORMERLY FILE NUMBER AC-002-0

0705-06.1.001 LINEAR PROGRAMMING  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-06.1.001

AUTHOR...DAVID H. BROWN  
ESSO STANDARD OIL COMPANY  
BATON ROUGE, LA.

DIRECT INQUIRIES TO AUTHOR

PURPOSE SOLVING LINEAR PROGRAMMING PROBLEMS, AND  
PERFORMING ASSOCIATED MATRIX MULTIPLICATIONS 60TH ORDER.

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FORMERLY FILE NUMBER E1-001-0

## 0705-06.1.002 PRODUCT INVERSE LINEAR PROGRAMMING

AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-06.1.002

AUTHORS..H. E. CLAYTON D. M. SMITH

DIRECT INQUIRIES TO..  
H. E. CLAYTON  
ESSO STANDARD OIL COMPANY  
LINDEN, NEW JERSEY

PURPOSE TO CALCULATE OPTIMUM SOLUTIONS FOR PROBLEMS INVOLVING UP TO 99 LINEAR CONSTRAINTS AND 120 VARIABLES. THE PROGRAM CONTAINS A PARTITIONING FEATURE USEFUL IN SOLVING BLOCK-TRIANGULAR /FOR INSTANCE, MULTI-GRADE BLENDING/ PROBLEMS. MULTIPLE PROFIT FUNCTIONS AND/OR MULTIPLE REQUIREMENTS VECTORS CAN BE HANDLED.

FORMERLY FILE NUMBER E2-005-0

## 0705-10.1.001 MATRIX INVERSION

AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-10.1.001

AUTHOR...F. R. PFAFF  
ESSO STANDARD OIL COMPANY  
LINDEN, N. J.

DIRECT INQUIRIES TO AUTHOR

PURPOSE TO INVERT A MATRIX AND/OR TO SOLVE SIMULTANEOUS LINEAR EQUATIONS.

FORMERLY FILE NUMBER E2-004-0

## 0705-11.1.001 LEAST SQUARES POLYNOMIAL CURVE-FITTING ROUTINE

AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-11.1.001

AUTHOR...W. R. BRITTENHAM  
A. O. SMITH CORPORATION  
EDP SYSTEMS  
3533 N. 27TH ST.  
MILWAUKEE 1, WISCONSIN

DIRECT INQUIRIES TO AUTHOR

PURPOSE TO PRODUCE THE COEFFICIENTS OF THAT POLYNOMIAL WHICH FITS GIVEN DATA IN THE LEAST SQUARES SENSE, AND TO PLOT THAT POLYNOMIAL AND THE GIVEN POINTS GRAPHICALLY ON THE PRINTER. THE PROGRAM MAKES LOGARITHMIC TRANSFORMATIONS ON GIVEN DATA WHEN REQUIRED.

FORMERLY FILE NUMBER A0-003-0

## 0705-11.1.002 CURVE-PLOTTING SUBROUTINE

AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-11.1.002

AUTHOR...W. R. BRITTENHAM

DIRECT INQUIRIES TO..  
W. R. BRITTENHAM,  
A. O. SMITH CORPORATION  
EDP SYSTEMS  
3533 N. 27TH ST.  
MILWAUKEE 1, WISCONSIN

PURPOSE TO CONVERT PRINT I FLOATING POINT NUMBERS INTO ONE OR MORE CURVES, WHICH ARE DISPLAYED GRAPHICALLY BY MEANS OF A PRINTER.

FORMERLY FILE NUMBER A0-004-0

## 0705-11.3.001 STEPWISE REGRESSION

AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 0705-11.3.001

AUTHORS..W. G. HYDE F. R. PRAFF R. W. SCHRAGE  
D. M. SMITH W. E. ZIEMAN

DIRECT INQUIRIES TO..

W. G. HYDE  
ESSO STANDARD OIL COMPANY  
LINDEN, NEW JERSEY

PURPOSE TO DEVELOP AN EQUATION EXPRESSING A DEPENDENT VARIABLE, Y, AS A FUNCTION OF AS MANY AS 50 INDEPENDENT VARIABLES, MULTIPLY REGRESSION ANALYSIS.

FORMERLY FILE NUMBER E2-003-0

# 1410

## 1410-01.3.001 SYSTEMS CONTROL PROGRAM

AVAILABLE 2ND QUARTER 1965.  
SPECIFY FILE NUMBER 1410-01.3.001

\*N

AUTHORS..WILLIAM L. HANLEY RICHARD I. SYMONS

DIRECT INQUIRIES TO..

WILLIAM L. HANLEY  
IBM CORP.  
GP PLANT - DEPT. 728  
SAN JOSE, CALIF.

THIS APPLICATION CONSISTS OF TWO SEPARATE PROGRAMS. THE FIRST PROGRAM WILL DEVELOP A SYSTEMS TAPE USING OBJECT PROGRAMS COMPILED IN 1410 IOCS, 1410 COBOL, 1410 AUTOCODER OR 1410 FORTRAN LANGUAGES. THE SECOND PROGRAM IS THE RESIDENT MONITOR THAT ACTUALLY CONTROLS THE USE OF THE SYSTEMS TAPE DURING PROCESSING TIME.

TO MAINTAIN AND UPDATE THE MONITOR REQUIRES A 1410 WITH A MINIMUM CONFIGURATION OF TWO TAPE DRIVES AND A 1402 CARD READER. IF PRINTING OF THE PROGRAM TAPE IS DESIRED, THE SYSTEM MUST ALSO HAVE A 1403 PRINTER. THE MAINTENANCE PROGRAM MAY BE RUN ON A 1401 WITH 2000 POSITIONS OF STORAGE OR THE 1410 WITH 1401 COMPATIBILITY SWITCH ON. THE MAINTENANCE PROGRAM WAS WRITTEN IN 1401 AUTOCODER LANGUAGE, NON IOCS AND THE 1410 MONITOR PROGRAM WAS WRITTEN IN 1410 AUTOCODER LANGUAGE, NON IOCS.

## 1410-01.4.001 INTERPRETIVE SYSTEM

AVAILABLE 4TH QUARTER 1963.  
SPECIFY FILE NUMBER 1410-01.4.001

AUTHOR...M. ORDORICA  
DANA CORPORATION  
TOLEDO, OHIO

DIRECT INQUIRIES TO AUTHOR

TO PROVIDE A COMPLETE FLOATING DECIMAL INTERPRETIVE SYSTEM FOR THE IBM 1410, PARTICULARLY SUITED FOR SCIENTIFIC AND ENGINEERING PROBLEMS AND FEATURING COMPLETE COMPATIBILITY WITH THE DELL INTERPRETIVE SYSTEM /L1/ FOR THE IBM 650. MACHINE REQUIREMENTS-A. 20K 1410  
B. 1402  
C. 1403  
D. 1411  
E. 1414  
F. 1415  
SOURCE DECK IS OPTIONAL AND WILL BE FOWARDED ONLY WHEN SPECIFICALLY REQUESTED.

## 1410-01.4.002 1410/7010 RELOCATABLE AUTOPATCH

AVAILABLE 1ST QUARTER 1964.  
SPECIFY FILE NUMBER 1410-01.4.002

AUTHOR...R. T. LILLY  
43 HARVARD ST.  
WORCESTER, MASS.

DIRECT INQUIRIES TO AUTHOR

1410/7010 RELOCATABLE AUTOPATCH IS A SELF-LOCATING, SELF-EXECUTING OBJECT SUBROUTINE WHICH MAY BE USED TO INSERT, DELETE, AND REPLACE INSTRUCTIONS AND ADD SUBROUTINES TO AN OBJECT PROGRAM USING AUTOCODER FORMAT CARDS. NO ADDITIONAL I/O UNIT OR CORE STORAGE IS NECESSARY. WRITTEN IN AUTOCODER

## 1410-01.4.003 2-ADDRESS INTERPRETIVE SYSTEM

AVAILABLE 1ST QUARTER 1964.  
SPECIFY FILE NUMBER 1410-01.4.003

AUTHOR...MIKE ORDORICA  
DANA CORPORATION  
TOLEDO, OHIO

DIRECT INQUIRIES TO AUTHOR

TO PROVIDE A COMPLETE FLOATING DECIMAL INTERPRETIVE SYSTEM FOR THE IBM 1410, PARTICULARLY SUITED FOR SCIENTIFIC AND ENGINEERING PROBLEMS. THIS SYSTEM HAS BEEN DESIGNED TO PROVIDE THE PROGRAMMER WITH THE MAXIMUM AMOUNT OF STORAGE DEPENDING ONLY ON THE PARTICULAR 1410 CORE CAPACITY. MACHINE REQUIREMENTS- 20K 1410, 1402, 1403, 1411, 1414, AND 1415.

## 1410-01.9.001 AUTOCODER MACROS

AVAILABLE 2ND QUARTER 1964.  
SPECIFY FILE NUMBER 1410-01.9.001

AUTHOR...BARBARA SEWARD

DIRECT INQUIRIES TO..

IVAN KEITHLEY  
IBM CORP.  
100 SOUTH WACKER DRIVE  
CHICAGO 6, ILL.

TO ELIMINATE CODING ERRORS AND SIMPLIFY CODING ON THE 1410. CONFIGURATION- ANY 1410 THAT USES 1410 AUTOCODER. STORAGE REQUIREMENTS- THESE VARY AND ARE LISTED INDIVIDUALLY FOR EACH MACRO IN THE CODING DESCRIPTION.

## 1410-02.1.001 SORT/MERGE 12, INSURANCE SORT MODIFICATION

AVAILABLE 2ND QUARTER 1963.  
SPECIFY FILE NUMBER 1410-02.1.001

AUTHOR...A. H. CASTIGLIONI  
IBM CORP.  
425 PARK AVE.  
NEW YORK 22, N.Y.

DIRECT INQUIRIES TO AUTHOR

THIS IS A GENERALIZED MODIFICATION TO SORT/MERGE 12-1410-SW-112. THE MODIFICATION ITSELF IS USED ONLY WHEN SORTING FIXED LENGTH RECORDS WITH MULTIPLE CONTROL FIELDS. IN ALL OTHER CASES, THE MODIFICATION WILL BE BYPASSED. IT WILL CONSIDERABLY INCREASE THE SPEED OF SORT 12 WHERE THERE ARE MULTIPLE CONTROL FIELDS WITH MOST SEQUENCE BREAKS COMING IN THE MINOR CONTROL FIELDS. THE REQUIRED 1410 CONFIGURATION IS 40,000 POSITIONS OF CORE STORAGE PLUS OTHER SORT 12 REQUIREMENTS. WRITTEN IN AUTOCODER.

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1410-02.4.001 CONVERSION OF DATA CONTROL  
FIELDS INTO ACTUAL DISK ADDRESSES V 1301  
AVAILABLE 3RD QUARTER 1964.  
SPECIFY FILE NUMBER 1410-02.4.001

AUTHOR...MR. K. POSPIESCHNY  
IBM GERMANY  
SINDELINGER STRASSE 68  
P.O. BOX 66  
703 BOEHLINGEN/WUERTT.  
GERMANY

DIRECT INQUIRIES TO AUTHOR

THIS PROGRAM HAS BEEN WRITTEN TO DETERMINE AN ASSIGNMENT OF  
CONTROL DATA FIELDS AND DISK ADDRESS IS WHERE THE DATA ARE TO BE  
LOCATED. THE CONTROL DATA FIELDS ARE CONVERTED TO DISK  
ADDRESSES FOR LOADING THE DATA ON DISK. THIS PROGRAM PERFORMS  
WELL FOR CONTROL FIELDS UP TO TEN POSITIONS IN LENGTH. A 20K  
1410 SYSTEM WITH A 1402 AND 1403, PLUS TWO TAPE UNITS, WILL  
SERVE TO IMPLEMENT THE PROGRAM. THE PROGRAM IS WRITTEN IN 1410  
IOCS.

1410-02.5.001 TABLE LOOKUP SUBROUTINE  
AVAILABLE 4TH QUARTER 1965.  
SPECIFY FILE NUMBER 1410-02.5.001

AUTHOR...F.J. BRICETTO  
IBM CORPORATION  
348 WEST CAMPBELL AVENUE  
ROANOKE, VIRGINIA

DIRECT INQUIRIES TO AUTHOR

AN AUTOCODER SUBROUTINE THAT ENABLES PROGRAMMER TO UTILIZE  
TABLE LOOKUP HARDWARE OF 1410 IN COBOL PROGRAM WRITTEN FOR 1410  
OPERATING SYSTEM. COBOL PROGRAMMER SUPPLIES PARAMETERS FOR  
ROUTINE AND THEN ENTERS COMMUNICATION-MODE UTILIZING  
,,ENTER,, VERB IN COBOL PROGRAM. RESULTS AND/OR FUNCTIONS  
ARE PLACED IN COBOL AREAS AFTER COMPLETION OF SUBROUTINE.  
57 SOURCE STATEMENTS.

1410-02.6.001 TENEX-TAPE EXECUTIVE SYSTEM  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 1410-02.6.001

AUTHOR...THEODORE D. WIESE, JR.  
DEPT. OF HEALTH, EDUCATION, AND WELFARE  
NATL. VITAL STATISTICS DIV.  
COMPUTER APPLICATIONS BRANCH  
WASHINGTON 25, D.C.

DIRECT INQUIRIES TO AUTHOR

TENEX WILL PACK AS MANY AS FIFTY PROGRAMS ON A SINGLE MAGNETIC  
TAPE. TENEX PROVIDES A ROUTINE THAT WILL SELECT ANY DESIRED  
PROGRAM FROM A PACKED TAPE AND LOAD IT INTO CORE. A TEN  
CHARACTER IDENTIFICATION IS USED FOR THIS PURPOSE. TENEX  
PROVIDES AN EXTENSIVE ROUTINE TO UPDATE PROGRAM TAPES. TENEX  
REQUIRES A 10K PROCESSOR, CONSOLE, AND A MINIMUM OF SIX TAPE  
DRIVES.

1410-03.1.001 1410/1401 MODE CHANGE  
MONITOR  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 1410-03.1.001

AUTHOR...MR. JAMES F. PIVEC  
IBM CORPORATION  
3610-14TH STREET  
RIVERSIDE, CALIFORNIA

DIRECT INQUIRIES TO AUTHOR

A PROGRAM TO FACILITATE EASY CHANGE BETWEEN 1410 AND 1401 MODE  
ON AN IBM 1410 SYSTEM. ESPECIALLY USEFUL IN THOSE INSTALLATIONS  
THAT RUN MANY 1401 PROGRAMS IN 1401 MODE.  
MACHINE REQUIREMENTS- 1410 SYSTEM WITH 40K MEMORY, 1402, AND  
PRIORITY FEATURE. CAN EASILY BE MODIFIED FOR DIFFERENT SIZE  
MEMORY AND FOR MACHINE WITHOUT PRIORITY FEATURE. OCCUPIES TOP  
400 POSITIONS OF MEMORY AT ALL TIMES. ALSO OCCUPIES POSITIONS  
200-400 WHILE IN 1410 MODE OR 15962-16045 WHILE IN 1401 MODE.  
SOURCE LANGUAGE-1410 AUTOCODER

1410-03.1.002 UPLD - UPOS LOADER  
AVAILABLE 1ST QUARTER 1964.  
SPECIFY FILE NUMBER 1410-03.1.002

AUTHOR...H.P. DAENDLIKER  
IBM SWITZERLAND  
TALSTRASSE 66  
ZUERICH 1, SWITZERLAND

DIRECT INQUIRIES TO AUTHOR

A 1410 PROGRAM OFFERING THE POSSIBILITY TO STORE UTILITY- AND  
OBJECT-PROGRAMS ON UPOS SYSTEMS- AND OBJECT-TAPES IN CORE-IMAGE  
FORM RATHER THAN AS ONE-CARD-RECORDS. THIS ALLOWS A SUBSTANTIAL  
SAVING IN PROGRAM-SEARCH-TIME. NO ADDITIONAL CORE-STORAGE IS  
REQUIRED FOR UPOS RUNS AND NO MODIFICATION OF THE UPOS  
CONTROL-PROGRAM IS NECESSARY. UPOS RUNS CAN STILL BE PERFORMED  
ACCORDING TO THE OFFICIAL WRITE-UP WITH THE EXCEPTION OF TWO  
CONTROL-CARDS TO BE PUT AS THE FIRST TWO CARDS IN FRONT OF THE  
CONTROL-UNIT-DECK.  
MACHINE CONFIGURATION-  
THE UPLD PROGRAM WILL RUN ON ANY 1410- OR 7010-SYSTEM WITH A  
CARD-READER AND 1 TAPE DRIVE.  
SOURCE LANGUAGE- AUTOCODER, IOCS.  
LANGUAGE OF WRITE-UP- ENGLISH.

1410-03.2.001 MONSTER SYSTEM  
AVAILABLE 1ST QUARTER 1963.  
SPECIFY FILE NUMBER 1410-03.2.001

CONTINUED FROM PRIOR COLUMN--

AUTHOR...K. W. JOHNSON  
SHELL OIL CO.  
50 WEST 50TH STREET  
NEW YORK 20, NEW YORK

DIRECT INQUIRIES TO AUTHOR

AN OBJECT PROGRAM MONITOR SYSTEM DESIGNED TO PROCESS  
OBJECT PROGRAMS COMPILED AND/OR ASSEMBLED BY FORTRAN,  
COBOL, AUTOCODER, OR THE REPORT PROGRAM GENERATOR.

IBM 1410 WITH AT LEAST ONE TAPE UNIT, 1403 PRINTER,  
1402 CARD READ-PUNCH, AND 20,000 POSITIONS OF CORE STORAGE.

MONSTER IS A SMALL AND FAIRLY SIMPLE MONITOR THAT WILL  
SUPERVISE OBJECT PROGRAMS BY MEANS OF CONTROL CARDS. THESE  
PROGRAMS MAY BE EITHER IN THE FORM OF A CARD DECK, OR ON  
THE MONITOR SYSTEM TAPE.

THE MONITOR OCCUPIES 1,200 CORE LOCATIONS FROM LOCATION  
500 TO 1,699 WHICH REQUIRES PROGRAMS TO ORIGIN AT 1,700,  
OR ABOVE. MONSTER IS IN CORE AT ALL TIMES DURING A MONITOR  
RUN. THE SYSTEM IS DESIGNED TO RUN STACKED JOBS.

\*N

1410-03.2.003 1410/1301 EXECUTIVE  
AVAILABLE 2ND QUARTER 1964.  
SPECIFY FILE NUMBER 1410-03.2.003

AUTHOR...AVRUM W.W. MARKS  
IBM CORP.  
1120 CONNECTICUT AVE. N.W.  
WASHINGTON 6, D.C. 20006

DIRECT INQUIRIES TO AUTHOR

THE 1410/1301 EXECUTIVE INCREASES THE THROUGHPUT OF A 1410 BY  
DECREASING PROGRAM LOAD TIME. THIS IS ONLY TRUE WHERE PROGRAMS  
OF ALL TYPES ARE STORED ON THE 1301 RATHER THAN READ INTO MEMORY  
VIA A CARD READER. THE EXECUTIVE IS DESIGNED FOR EASE OF  
OPERATION, MAINTENANCE, LOADING OLD AND NEW PROGRAMS TO THE FILE,  
ETC. TOTAL SIZE IS 2165 CHARACTERS IN LENGTH WITH EXECUTION TIME  
ALMOST NEGLIGIBLE. 1410/1301 EXECUTIVE CAN BE UTILIZED AS THE  
FOUNDATION OF AN OPERATING SYSTEM BY ALTERING OTHER COMPONENTS  
TO /BOOTSTRAP/ IN THE EXECUTIVE AND THE EXECUTIVE WOULD CALL IN  
OTHER COMPONENTS AS NEEDED. MACHINE SIZE IS A 1410 WITH 40K AND  
A 1301.

1410-03.2.004 EVALUATION OF ADDRESSING  
TECHNIQUES  
AVAILABLE 3RD QUARTER 1964.  
SPECIFY FILE NUMBER 1410-03.2.004

AUTHOR...MR. K. POSPIESCHNY  
IBM GERMANY  
SINDELINGER STRASSE 68  
P.O. BOX 66  
703 BOEHLINGEN/WUERTT.  
GERMANY

DIRECT INQUIRIES TO AUTHOR

THIS PROGRAM HAS BEEN WRITTEN TO FACILITATE THE EVALUATION OF  
THE ADDRESSING TECHNIQUE EMPLOYED IN FILE PACKING FOR THE 1301.  
THE PROGRAM SIMULATES THIS PACKING FOR A SPECIAL CONSTELLATION  
OF DISK ADDRESSES. THE ONLY RESTRICTION APPARENT IS THAT NOT  
MORE THAN 19 OVERFLOW RECORDS IN ONE CHAIN CAN BE PROCESSED. THE  
PROGRAM WAS WRITTEN IN 1410 IOCS FOR AN 80K 1410 SYSTEM WITH 2  
TAPE UNITS AND A 1403 PRINTER.

1410-03.4.001 LABEL AND SERIAL NUMBER  
TAPES  
AVAILABLE 2ND QUARTER 1963.  
SPECIFY FILE NUMBER 1410-03.4.001

AUTHOR...J. NOTSCH  
IBM CORP.  
P.O. BOX 736  
WHEELING, W.V.

DIRECT INQUIRIES TO AUTHOR

A 1410 PROGRAM THAT WRITES TEMPORARY HEADER LABELS AND SERIAL  
NUMBERS TAPES. CONSOLE WRITES SPECIFIC INSTRUCTIONS TO  
OPERATOR AND PERMITS ENTRY OF BEGINNING SERIAL NUMBER. AT  
CONCLUSION OF PROGRAM, CONSOLE TYPES FIRST SERIAL NUMBER USED,  
LAST SERIAL NUMBER USED AND NEXT AVAILABLE SERIAL NUMBER.  
SOURCE PROGRAM WRITTEN FOR TWO-CHANNEL, SIX-TAPE CONFIGURATION  
WITH PRIORITY FEATURE, BUT MAY READILY BE MODIFIED AND  
REASSEMBLED TO ACCOMMODATE ANY TAPE CONFIGURATION WITH OR WITHOUT  
PRIORITY FEATURE.

1410-03.4.002 TAPE PRINT, DUPLICATE,  
SELECT AND MATCHING  
AVAILABLE 4TH QUARTER 1965.  
SPECIFY FILE NUMBER 1410-03.4.002

AUTHOR...A.L. DEMUNITIZ  
COMPUTER SCIENCES CORPORATION  
650 NORTH SEPULVEDA BLVD.  
EL SEGUNDO, CALIFORNIA

DIRECT INQUIRIES TO AUTHOR

WIDE APPLICATION TAPE PROCESSING PROGRAM DESIGNED TO USE FEW AND  
SIMPLE CONTROL CARDS ON AN IBM 1410 SYSTEM WITH AT LEAST 40K  
MEMORY SIZE. TAPE TO PRINT FUNCTION COVERS COLUMN HEADINGS,  
EDITING AND TOTALIZATION WITH MULTIPLE CONTROL BREAKS. TAPE TO  
TAPE DUPLICATION YIELDS EITHER INPUT FORMAT, DETAIL PRINT FORMAT  
OR TOTAL LINE PRINT FORMAT. SELECTION AND REJECTION OF INPUT  
RECORDS FOR UNLIMITED NUMBER OF CONTROL FIELDS AND CONTROL WORDS.  
MATCHING OF MAIN INPUT TAPE WITH AUXILIARY INPUT TAPE FOR PURPOSE  
OF SELECTION FROM THE MAIN TAPE OR TRANSFER OF DATA FROM  
AUXILIARY TO MAIN. COMBINATION OF ABOVE FUNCTIONS POSSIBLE.  
BATCH PROCESSING. SOURCE LANGUAGE IS 1410 AUTOCODER. OPERATES  
UNDER 1410/7010 OPERATING SYSTEM PR-155. 2267 SOURCE STATEMENTS.  
THE TWO /2/ REELS OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM

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MATERIAL MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH.

1410-03.4.003 1410/7010 COPY- OPERATING SYSTEM PROGRAM  
AVAILABLE 3RD QUARTER 1965.  
SPECIFY FILE NUMBER 1410-03.4.003

AUTHOR...MR. FRED H. OTTE  
IBM CORP.  
DEPT. 570, BLDG. 500-59  
HOPEWELL JUNCTION, N.Y.

DIRECT INQUIRIES TO AUTHOR

THIS PROGRAM COPIES THE TAPE ASSIGNED TO MW2 ONTO THE TAPE ASSIGNED TO MW3. AS MANY FILES AS SPECIFIED IN THE FOURTH OPERAND OF THE EXECUTE CARD ARE COPIED. ABSENCE OF A FOURTH OPERAND ASSUMES ONE FILE. PARITY MAY BE EVEN OR ODD., THIS NEED NOT BE SPECIFIED IN THE CONTROL CARD. IT ALSO CAN BE INTERMIXED. THE MACHINE CONFIGURATION REQUIRED IS A- 1410 OR 7010, 3 TAPE DRIVES /5 IS MINIMUM FOR TAPE ORIENTED OPERATING SYSTEM/, CARD READER, 1410/7010 OPERATING SYSTEM. THE PROGRAM USES 2150 POSITIONS OF CORE. THE 2 I/O AREAS OCCUPY THE MEMORY AVAILABLE AFTER SUBTRACTING THE SIZE OF THE RESIDENT MONITOR AND THE SIZE OF THIS PROGRAM. THE SOURCE LANGUAGE IS- AUTOCODER, IOCS.

1410-03.4.004 1410/7010 TFG- TAPE FILE GENERATOR  
AVAILABLE 3RD QUARTER 1965.  
SPECIFY FILE NUMBER 1410-03.4.004

AUTHOR...MR. FRED H. OTTE  
IBM CORP.  
DEPT. 570, BLDG. 500-59  
HOPEWELL JUNCTION, N.Y.

DIRECT INQUIRIES TO AUTHOR

THIS TAPE FILE GENERATOR CREATES TAPE FILES FOR TESTING PURPOSES. IT PERFORMS THE SAME FUNCTION AND USES THE SAME INPUT AS THE TAPE FILE GENERATOR TFG-A ASSOCIATED WITH UPOS. THE MACHINE CONFIGURATION REQUIRED IS A- 1410 OR 7010, 40K, CARD READER. THE MINIMUM OF 5 TAPE DRIVES FOR THE TAPE ORIENTED OPERATING SYSTEM IS NOT EXCEEDED. REQUIRES THE 1410/7010 OPERATING SYSTEM. TFG USES 21402 POSITIONS OF CORE, THIS CAN BE REDUCED CONSIDERABLY. THE SOURCE LANGUAGE IS- AUTOCODER, IOCS.

1410-03.4.005 1410/7010 COMPARE  
AVAILABLE 3RD QUARTER 1965.  
SPECIFY FILE NUMBER 1410-03.4.005

AUTHOR...MR. FRED H. OTTE  
IBM CORP.  
DEPT. 570, BLDG. 500-59  
HOPEWELL JUNCTION, N.Y.

DIRECT INQUIRIES TO AUTHOR

THIS PROGRAM COMPARES THE FIRST FILES ON TWO TAPES. DIFFERENCES ARE DISPLAYED ON THE CONSOLE PRINTER AND THE OPERATOR IS GIVEN THE OPTION OF CONTINUING OR TERMINATING THE RUN. PARITY MAY BE ODD OR EVEN. THE MACHINE CONFIGURATION REQUIRED IS A- 1410 OR 7010, 40K, CARD READER, TAPES. TAPE ORIENTED OPERATING SYSTEM /REQUIRES A MINIMUM OF 5 TAPE DRIVES/. THE PROGRAM USES 1716 POSITIONS OF CORE. IN ADDITION THERE ARE 2 INPUT AREAS WITH 12,000 POSITIONS EACH. CORE REQUIREMENTS CAN BE CHANGED BY ALTERING THE INPUT AREAS. THE SOURCE LANGUAGE IS- AUTOCODER, IOCS.

1410-03.5.001 GET PUT DISK SUBROUTINE  
AVAILABLE 4TH QUARTER 1965.  
SPECIFY FILE NUMBER 1410-03.5.001

AUTHOR...F.J. BRICKETTO  
IBM CORPORATION  
348 WEST CAMPBELL AVENUE  
ROANOKE, VIRGINIA

DIRECT INQUIRIES TO AUTHOR

A 1301 DISK SUBROUTINE DESIGNED TO ENABLE USER TO READ OR WRITE DISK RECORDS WHEN WRITING IN COBOL LANGUAGE FOR 1410/7010 OPERATING SYSTEM. PROGRAM USES 292 POSITIONS OF CORE STORAGE AND IS WRITTEN IN 1410/7010 AUTOCODER - IOCS. PROGRAM EXECUTION TIME IS DEPENDENT UPON NUMBER OF RECORDS READ OR WRITTEN FROM THE DISK FILE. IT IS PRESENTLY BEING USED SUCCESSFULLY AT ONE INSTALLATION FOR A PERIOD OF TWO MONTHS.

1410-03.9.001 MACRO ADD XX, SUBTRACT XX, MULTIPLY XX, DIVIDE XX.  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 1410-03.9.001

AUTHOR...K. S. REID-GREEN  
HERCULES POWDER CO.  
MAGNA, UTAH

DIRECT INQUIRIES TO AUTHOR

TO FACILITATE AUTOMATIC DECIMAL CALCULATIONS. THE ARITHMETIC OPERATION SPECIFIED BY THE MNEMONIC CALL NAME IS PERFORMED ON THE SECOND PARAMETER OF THE MACRO OPERAND BY THE FIRST PARAMETER OF THE MACRO OPERAND. THE RESULT OF THE CALCULATION IS PLACED IN THE FIELD SPECIFIED BY THE THIRD PARAMETER. THE CONTENTS OF PARAMETERS 1 AND 2 REMAIN UNDISTURBED. PARAMETERS 1, 2, AND 3 MAY BE INDEXED AND ADDRESS-ADJUSTED. PARAMETERS 1 AND 2 MAY BE NUMERIC LITERALS.

1410-03.9.002 SORT TIMING PROGRAM  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 1410-03.9.002

AUTHOR...MARSHALL PINE  
IBM CORPORATION  
P.O. BOX 5200  
INGLEWOOD, CALIFORNIA

DIRECT INQUIRIES TO AUTHOR

THE FUNCTION OF THE 1410 SORT TIMING PROGRAM IS TO CALCULATE TIMING ESTIMATIONS FOR SORTING APPLICATIONS ON THE IBM 1410 DATA PROCESSING SYSTEM. THE TIMING ESTIMATIONS CAN BE FOR EITHER 1410 SORT/MERGE 11 OR 1410 SORT/MERGE 12. THE TIMING FORMULAS USED BY THE PROGRAM ARE THOSE PUBLISHED IN TECHNICAL NEWSLETTERS N28-1019 AND N28-1020 AND INCLUDE THE FORMULAS PUBLISHED IN THE SORT/MERGE 12 TIMING TABLES JC28-0293/ FOR MULTIPLE CONTROL FIELDS. IN ADDITION TO THE CALCULATION OF TIMING ESTIMATIONS, THE PROGRAM CAN ALSO DEVELOP AN OPTIMIZING FACTOR FOR THE INTERNAL SORT FACTOR-G, AND IT CAN TAKE INTO CONSIDERATION THE ACCELERATOR SPECIAL FEATURE.

1410-03.9.003 CHAIN-SPLITTING AND TAPING A PROGRAM WHICH EXCEEDS 1410 CORE STORAGE CAPACITY  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 1410-03.9.003

AUTHOR...W.D. THORPE

DIRECT INQUIRIES TO..

A.M. VALENTI  
HYPERSONIC GROUP  
MECHANICAL ENGINEERING DEPT.  
MCGILL UNIVERSITY  
MONTREAL, CANADA

TO PROVIDE THE PROGRAMMER WITH A SUBROUTINE WHICH PERMITS EXECUTION OF A FORTRAN PROGRAM WHICH EXCEEDS 1410 CORE STORAGE, BY SPLITTING THE PROGRAM INTO SEGMENTS AND STORING THEM ON TAPE.

THE ORIGINAL FORTRAN PROGRAM IS SPLIT INTO SUITABLY SIZED SEPARATE PROGRAM SEGMENTS, EACH OF WHICH WILL FIT INTO CORE STORAGE WITH ALL SUBROUTINES IT REQUIRES, INCLUDING CHAIN, AND ALL THE COMMON VARIABLES. ALL VARIABLES SHARED BY THE SEPARATE PROGRAMS MUST BE COMMON-ED. EACH PROGRAM SEGMENT IS COMPILED AS A SEPARATE PROGRAM. STORAGE REQUIREMENTS-CHAIN REQUIRES 1357 CHARACTERS OF STORAGE AND IN ADDITION USES AND DOES NOT RESTORE INDEX REGISTERS 13, 14, 15. EQUIPMENT SPECIFICATIONS-1. LOADING PROGRAMS- 1410 WITH 3 TAPE UNITS  
2. RUNNING PROGRAMS- 1410 WITH 1 TAPE UNIT  
3. ALTERING PROGRAMS- 1410 WITH 4 TAPE UNITS  
SOURCE LANGUAGE-1410 AUTOCODER

1410-03.9.004 PROGRAM FOR SELECTION, EXTRACTION AND COUNT  
AVAILABLE 4TH QUARTER 1964.  
SPECIFY FILE NUMBER 1410-03.9.004

AUTHOR...MR. A. BUISSON  
SOCIETE NATIONALE DES CHEMINS DE FER BELGES  
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BRUSSELS - BELGIUM

DIRECT INQUIRIES TO AUTHOR

THE PROGRAM IS INTENDED TO EXTRACT AND COUNT ALL THE RECORDS MATCHING PREDETERMINED CRITERIA. MACHINE REQUIREMENTS- IBM 1410 - 20,000 CORE POSITIONS, IBM 1402 - CARD READER, IBM 1403 - PRINTER, 2 TAPE UNITS 729 OR 7330. WRITTEN IN AUTOCODER.

1410-03.9.005 FOUR LINE EXECUTE COREDUMP  
AVAILABLE 1ST QUARTER 1965.  
SPECIFY FILE NUMBER 1410-03.9.005

AUTHOR...C.R. JENNINGS  
IBM CORP.  
6900 FANNIN  
HEUSTON, TEXAS 77025

DIRECT INQUIRIES TO AUTHOR

THIS IS A COMPACT, MEMORY-LISTING PROGRAM /WRITTEN IN AUTOCODER/ FOR THE IBM 1410. IT IS UNIQUE IN ITS MINIMAL STORAGE REQUIREMENT FOR HIGH SPEED OUTPUT USING OPTIMUM SIMPLICITY IN STORAGE DISPLAY.

1410-03.9.006 1410/7010 EXITS  
AVAILABLE 3RD QUARTER 1965.  
SPECIFY FILE NUMBER 1410-03.9.006

AUTHOR...MR. FRED H. OTTE  
IBM CORP.  
DEPT. 570, BLDG. 500-59  
HOPEWELL JUNCTION, N.Y.

DIRECT INQUIRIES TO AUTHOR

THIS MACRO IS USED TO TYPE OUT 80 CHARACTER HEADER AND TRAILER LABELS. FIVE TYPES OF TRAILERS ARE TYPED OUT FOR EACH TAPE. THESE ARE- INPUT HEADER LABELS... INPUT TRAILER LABELS... OUTPUT HEADER LABELS BEFORE WRITING ON THE TAPE... OUTPUT TRAILER LABELS AFTER WRITING ON THE TAPE... OUTPUT TRAILER LABELS. THE MACHINE CONFIGURATION REQUIRED IS A- 1410 OR 7010, 40K TAPE ORIENTED 1410/7010 OPERATING SYSTEM. THIS SYSTEM REQUIRES A MINIMUM OF 5 TAPES. POSITIONS OF CORE REQUIRED- 658. THE SOURCE LANGUAGE IS- MACRO MODEL STATEMENTS.

1410-03.9.007 1410/7010 FLIP  
AVAILABLE 3RD QUARTER 1965.  
SPECIFY FILE NUMBER 1410-03.9.007

DIRECT INQUIRIES TO AUTHOR

THIS PROGRAM IS USED TO EXCHANGE THE POSITIONS OF THE 1410/7010 OPERATING SYSTEM. THE SOURCE LANGUAGE IS- MACRO MODEL STATEMENTS.

# Contributed Programs

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CONTINUED FROM PRIOR PAGE--

AUTHOR...MR. FRED H. OTTE  
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DIRECT INQUIRIES TO AUTHOR

THIS MACRO WILL MAKE IT POSSIBLE FOR A PROGRAM FOLLOWING A SORT TO READ THE CORRECT SORT OUTPUT. IN ADDITION, THE POTENTIALLY IDLE ALTERNATE SORT OUTPUT DRIVE CAN BE UTILIZED. THE MACHINE CONFIGURATION REQUIRED IS A-1410 OR 7010, 40K. TAPE ORIENTED 1410/7010 OPERATING SYSTEM. THIS SYSTEM REQUIRES 5 TAPES. FLIP REQUIRES A MAXIMUM OF 170 POSITIONS OF CORE.

1410-03.9.008 1410/7010 TAPE SORT  
MODIFICATION \*N  
AVAILABLE 3RD QUARTER 1965.  
SPECIFY FILE NUMBER 1410-03.9.008

AUTHOR...MR. FRED H. OTTE  
IBM CORP.  
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HOPEWELL JUNCTION, N.Y.

DIRECT INQUIRIES TO AUTHOR

THIS PACKAGE CONSISTS OF A MODIFICATION TO THE 10K0F MACRO AND OF 3 SMALL AUTOCODER PROGRAMS. IT PERFORMS FOUR FUNCTIONS- PRODUCES A MESSAGE INSTRUCTING THE OPERATOR WHEN AND WHERE TO MOUNT THE FINAL OUTPUT TAPE... INPUT AND OUTPUT 80-CHARACTER HEADER-LABELS ARE TYPED OUT AND IDENTIFIED... ALL ERRONEOUS RECORDS /DATA DECK AND WRONG LENGTH/ ARE TYPED OUT... THE 80 CHARACTER INPUT HEADER LABEL CAN BE TRANSFERRED TO THE OUTPUT TAPE BY SPECIFYING THE PARAMETER OCR-TRANS ON THE ,,LABELDES SORT,, CONTROL CARD. THE MACHINE CONFIGURATION REQUIRED IS A-1410 OR 7010 WITH 40K, TAPE ORIENTED OPERATING SYSTEM. THIS SYSTEM REQUIRES A MINIMUM OF 5 TAPE DRIVES. THE SOURCE LANGUAGE IS- AUTOCODER AND 851 POSITIONS ARE USED.

1410-10.1.001 TOES- TAPE ORIENTED EQUATION  
SOLVER \*N  
AVAILABLE 3RD QUARTER 1965.  
SPECIFY FILE NUMBER 1410-10.1.001

AUTHOR...MR. R. STEPHENSON

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DR. CARL EVERT  
COMPUTING CENTER  
UNIVERSITY OF CINCINNATI  
CINCINNATI, OHIO 45221

THIS PROGRAM WILL INVERT A MATRIX UP TO 200 X 200 AND SOLVE THE ASSOCIATED SIMULTANEOUS LINEAR EQUATIONS. EQUIPMENT REQUIRED BY PROGRAM- 1410 WITH 5 MAGNETIC TAPE DRIVES AND A 1403 PRINTER. PROGRAMMED IN- FORTRAN IV. THREE TAPE DRIVES MAY BE REMOVED IF THE PROGRAM IS CONVERTED TO FORTRAN II.

1410-11.3.001 STEPWISE MULTIPLE LINEAR  
REGRESSION ANALYSIS \*N  
AVAILABLE 3RD QUARTER 1965.  
SPECIFY FILE NUMBER 1410-11.3.001

AUTHOR...W.D. STEVENS  
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TULSA, OKLA.

DIRECT INQUIRIES TO AUTHOR

TO SOLVE FOR THE COEFFICIENTS IN A REGRESSION EQUATION USING AN ANALYSIS OF VARIANCE TO SELECT ONLY THE VARIABLES WHICH MEET A PRESCRIBED SIGNIFICANCE TEST. MACHINE REQUIREMENTS- 40,000 CHARACTERS OF STORAGE AND 6 TAPES.

THE PROGRAM HAS BEEN WRITTEN AS TWO INDEPENDENT PHASES. PHASE 1 READS AND TRANSFORMS INPUT AND FORMS SIMPLE CORRELATIONS FOR UP TO 46 VARIABLES. PHASE 2 SOLVES FOR THE COEFFICIENTS, EITHER DIRECTLY OR STEPWISE, FROM ANY SYSTEM OF EQUATIONS FORMED AS A SUBSET OF THE 46 VARIABLES TO A MAXIMUM OF 25 INDEPENDENT AND ONE DEPENDENT.

1410-11.3.002 MULTIPLE REGRESSION PROGRAM  
AVAILABLE 1ST QUARTER 1965.  
SPECIFY FILE NUMBER 1410-11.3.002

AUTHOR...SAUL ASCHKENASY  
IBM CORP.  
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WHITE PLAINS, NEW YORK

DIRECT INQUIRIES TO AUTHOR

THIS PROGRAM WILL ACCOMPLISH A REGRESSION ANALYSIS OF UP TO 13 INDEPENDENT VARIABLES. DATA IS ENTERED IN ITS RAW FORM AND AT THE OPTION OF THE USER MAY BE TRANSFORMED BY ANY ONE OF FIFTEEN DIFFERENT TRANSFORMATIONS. UTILIZING THE LEAST SQUARES TECHNIQUE, THE PROGRAM THEN COMPUTES AND LISTS THE SIMPLE CORRELATION COEFFICIENTS BETWEEN ANY TWO VARIABLES, THE REGRESSION EQUATION, THE TRANSFORMED VARIABLE VALUES, THE REGRESSION ESTIMATES OF THE DEPENDENT VARIABLE, DIFFERENCES BETWEEN ACTUAL VALUES OF THE DEPENDENT VARIABLE, AND THESE REGRESSION ESTIMATES, TOTAL SUM OF SQUARES, SUM OF SQUARES REMOVED BY REGRESSION, RESIDUAL SUM OF SQUARES, STANDARD ERROR OF ESTIMATE, MULTIPLE CORRELATION COEFFICIENT, F TEST, AND THE SIGNIFICANCE OF EACH COEFFICIENT OF THE REGRESSION EQUATION. WRITTEN IN FORTRAN REQUIRES A 40K SYSTEM WITH MULTIPLY-DIVIDE AND ADVANCE PROGRAMMING FEATURES. IT CAN BE EASILY MODIFIED BY THE USER TO RUN ON THE IBM 1401 OR TO HANDLE EVEN LARGER PROBLEMS.

1410-11.9.001 CHI SQUARE /5 DIGIT CELLS/  
AVAILABLE 1ST QUARTER 1964.  
SPECIFY FILE NUMBER 1410-11.9.001 \*M

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AUTHOR...MARTIN B. SOLOMON, JR.  
COMPUTING CENTER  
UNIVERSITY OF KENTUCKY  
LEXINGTON, KENTUCKY

DIRECT INQUIRIES TO AUTHOR

A PROGRAM TO BUILD TWO WAY FREQUENCY TABLES AND COMPUTE THE STATISTIC CHI SQUARE FOR EACH TABLE. MACHINE CONFIGURATION-40K-1410 WITH 1402 AND 1403. NO TAPES REQUIRED. SOURCE LANGUAGE-1410 COBOL-61.

THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH. \*

1410-12.2.001 NETWORK RENUMBERING ROUTINES  
AVAILABLE 2ND QUARTER 1964.  
SPECIFY FILE NUMBER 1410-12.2.001

AUTHOR...RICHARD A. STACK  
IBM CORP.  
618 S. MICHIGAN  
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DIRECT INQUIRIES TO AUTHOR

THE NETWORK RENUMBERING ROUTINES WILL PROCESS AN ARBITRARILY NUMBERED NETWORK TO CONVERT IT TO THE FORM REQUIRED BY MOST NETWORK PROCESSING PROGRAMS, I.E., THE NUMBER OF THE INITIAL NODE OF AN ACTIVITY WILL BE LOWER THAN THAT OF THE TERMINAL NODE, AND THE NETWORK WILL BE NUMBERED CONTIGUOUSLY. KNOWN RESTRICTIONS ARE- /1/ EACH NETWORK ACTIVITY MUST BE UNIQUELY IDENTIFIED. /2/ NODE NUMBER 0000 IS NOT ALLOWED, AND THE INITIAL NODE NUMBER OF THE FIRST ACTIVITY OF THE NET MUST BE 0001. /3/ NETWORKS CAN BE NO LARGER THAN 4000 ACTIVITIES. /4/ NO NODE CAN BE THE TERMINAL NODE FOR MORE THAN 400 ACTIVITIES. RESTRICTIONS 3 AND 4 CAN BE ERASED IF MORE THAN 40K IS AVAILABLE. THE ROUTINES WERE WRITTEN FOR A NETWORK OF IBM 1410 WITH 40K, 5 TAPE DRIVES, AND THE PRIORITY AND OVERLAP SPECIAL FEATURES. THE ROUTINES CONSIST OF 7 PROGRAMS WRITTEN IN AUTOCODER - 10CS, AND A MODIFIED VERSION OF SORT 11.

1410-12.9.001 ELECTRIC LOAD FLOW FOR IBM  
1410 SYSTEM \*M  
AVAILABLE 1ST QUARTER 1965.  
SPECIFY FILE NUMBER 1410-12.9.001

AUTHOR...WESLEY L. FOLSOM

DIRECT INQUIRIES TO...

LAJALZO  
IBM CORP. A/D  
3424 WILSHIRE BLVD.  
LOS ANGELES 5, CALIF.

ELECTRIC LOAD FLOW IS A MOST VITAL ASPECT OF PROPER SYSTEM PLANNING IN THE ELECTRIC UTILITY INDUSTRY. BY CONDUCTING SUCH STUDIES ON A DIGITAL BASIS, THE UTILITY ENGINEER IS PROVIDED WITH THE BEST MEANS OF DETERMINING THE ADEQUACY OF HIS POWER SYSTEM TO CARRY BOTH EXISTING AND FUTURE LOAD REQUIREMENTS. AS SUCH, IT ALSO OFFERS A POWERFUL GUIDE TO UTILITY MANAGEMENT IN THEIR PLANS FOR FUTURE GENERATOR ADDITIONS AND EXPANSION OF THEIR TRANSMISSION AND DISTRIBUTION FACILITIES, ALL OF WHICH INVOLVE LARGE CAPITAL EXPENDITURES. THE PROGRAM PROVIDES THE POWER SYSTEM PLANNING OR OPERATING ENGINEER WITH A DISPLAY OF POWER SYSTEM PERFORMANCE UNDER THE SELECTED TERMINAL CONDITIONS OF HIS CHOICE. AUTOMATIC REACTIVE VOLT-AMPERE CONTROL OR VOLTAGE CONTROL AT GENERATOR BUSES. TAPS ON TRANSFORMERS ARE AUTOMATICALLY ADJUSTED. INTERCHARGE POWER IS AUTOMATICALLY CONTROLLED. THE MINIMUM CONFIGURATION HANDLES 225 BUSES, 50 GENERATORS, 150 TRANSFORMERS, AND 400 LINES, BUT THESE SIZES CAN BE CHANGED BY REASSEMBLING. THE SOURCE LANGUAGE IS AUTOCODER WITH MINIMUM CONFIGURATION- A 40K 1410 WITH THREE TAPES - AND EITHER AN ONLINE 1402/1403 OR AN OFFLINE 1401 SYSTEM. THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH. \*M \*M

1410-13.2.001 CONSOLE DEMONSTRATION  
PROGRAM \*N  
AVAILABLE 4TH QUARTER 1962.  
SPECIFY FILE NUMBER 1410-13.2.001

AUTHOR...ANN S. MILLER  
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THIS PROGRAM GIVES A PERSONAL GREETING TO ANY VISITOR AND ALLOWS THE VISITOR TO ACTUALLY USE THE MACHINE. THE 1410 REQUESTS THE VISITOR TO TYPE IN VARIOUS NUMBERS FOR ADDING AND MULTIPLYING. THE PROGRAM IS WRITTEN IN FORTRAN SUBROUTINE FORM SO THAT OTHER TRICKS MAY BE ADDED.

1410-14.3.001 1410/1301 PERT III PROGRAM-  
TIME MODULE \*R  
AVAILABLE 3RD QUARTER 1964.  
SPECIFY FILE NUMBER 1410-14.3.001

AUTHOR...HEADQUARTERS  
AIR FORCE SYSTEMS COMMAND  
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DIRECT INQUIRIES TO AUTHOR

PROGRAM FOLLOWS THE INPUT/OUTPUT SPECIFICATIONS OUTLINED IN USAF, PERT/TIME SYSTEM DESCRIPTION MANUAL, VOL. 1 SEPT. 1963. PROGRAM INCLUDES NETWORK SUMMARIZATION AND EXTENSIVE SHREDOUT CAPABILITIES. NETWORK LIMITS - 13,059 EVENTS AND 20,159 ACTIVITIES WITH 118 CYLINDERS OF WORK AREA. PROCESSES THREE TIME ESTIMATES GIVEN IN 5, 6 OR 7 DAY WORKING WEEKS. MINIMUM CONFIGURATION - 1410-40K WITH, ON CHANNEL 1, ONE TAPE DRIVE,

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1402 CARD READ PUNCH, AND ONE MODULE OF 1301 DISK STORAGE WITH 10 CYLINDERS OF PROGRAM STORAGE AND 36 CYLINDERS OF WORK AREA. PROCESSING OVERLAP AND PRIORITY INTERRUPT ARE REQUIRED. PROGRAMMED IN FULL AUTOCODER. USES STANDARD IBM 1410-1301 IOCS AND SORT.  
THE FOUR 7/4 REELS OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH.

7070-01.9.003 GENERATION OF 1401 OPTIMIZED PROGRAMS /GOOP/ AVAILABLE 4TH QUARTER 1961. SPECIFY FILE NUMBER 7070-01.9.003

\*M

AUTHOR...ELMER D. STONEHILL  
THE OHIO OIL COMPANY  
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DIRECT INQUIRIES TO AUTHOR

TO GENERATE EFFICIENT 1401 CARD-TO-TAPE, TAPE-TO-PRINTER, AND TAPE-TO-CARD PROGRAMS WHICH REDUCE 7070 PROGRAMMING EFFORT AND ELIMINATE THE NEED FOR 1401 PROGRAMMERS AND 1401 PROGRAM MAINTENANCE. 7070 /1/ 10K MEMORY, AND /2/ FIVE MODEL 72911 OR 7291V TAPE UNITS. 1401 /1/ MODEL C3 PROCESSING UNIT WITH A MINIMUM OF 4K MEMORY, /2/ 1402 CARD-READ PUNCH, /3/ 1403 MODEL2 PRINTER, /4/ ONE MODEL 72911 OR 7291V TAPE UNIT, /5/ HIGH-LOW-EQUAL COMPARE, AND /6/ THE ADVANCED PROGRAMMING PACKAGE. CARD-TO-TAPE EXTENSIVE ERROR CHECKING INCLUDING DOUBLE PUNCH AND BLANK COLUMN DETECTION COMBINING UP TO NINE CARD RECORDS INTO ONE TAPE RECORD OR CONSTRUCTING UP TO NINE DIFFERENT TAPE RECORDS FROM DIFFERENT TYPES OF INPUT CARDS AND COMPLETE REARRANGEMENT OF FIELDS. TAPE-TO-PRINTER PROCESSING UP TO NINE TAPE RECORD FORMATS WITH VARYING PRINTING REQUIREMENTS FOR EACH FORMAT. INCLUDES COLUMN HEADINGS, NAME AND ADDRESS PRINTING, ALPHABETIC DESCRIPTIONS, TOTALING, SPACING AND FIELD REARRANGEMENT PRINTING SEVERAL REPORTS FROM ONE 7070 OUTPUT TAPE PRINTING UP TO NINE LINES OF COLUMN HEADING INFORMATION OUT OF 1401 MEMORY AND ACCUMULATING AND PRINTING UP TO SIX LEVELS OF TOTALS. TAPE-TO-CARD PUNCHING INFORMATION SELECTIVELY INTO CARDS FROM REPORT TAPES CARD COMPATIBILITY WITH THE 650 SYSTEM /X OVER-PUNCHING AND GANG PUNCHING/ AND PUNCHING SEVERAL TYPES OF CARDS FROM SEVERAL TAPE RECORD FORMATS OUT OF ONE FILE, INCLUDING FIELD REARRANGEMENT. NOTE IF DESIRED /A MAXIMUM OF 4/ COPIES OF THE GOOP REFERENCE MANUAL WILL BE SUPPLIED.  
THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM

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\*M

MATERIAL MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH.

7070-01.9.004 ZEUS PROGRAM ANALYSIS /ZPA/ COMPUTER SYSTEM AVAILABLE 1ST QUARTER 1962. SPECIFY FILE NUMBER 7070-01.9.004

\*M

AUTHORS..OPERATIONS ENGINEERING DEPARTMENT  
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DIRECT INQUIRIES TO AUTHOR

THE ZPA COMPUTER SYSTEM IS A SERIES OF FOUR PROGRAMS DESIGNED TO PROCESS PERT TYPE NETWORKS ON AN IBM 1401/7070 COMPUTER SYSTEM. THE PROGRAMS IN THE SYSTEM ARE WRITTEN FOR AN IBM 1401, 8K MACHINE AND AN IBM 7070, 2 CHANNEL, 10K, TAPE ORIENTED MACHINE. THERE ARE CERTAIN REQUIREMENTS THAT MUST BE CONSIDERED IN PROCESSING NETWORKS WITH THE ZPA SYSTEM. FIRST, THE PROGRAMS WERE DESIGNED TO PROCESS /ACTIVITY ORIENTED/ NETWORKS. ALTHOUGH /EVENT ORIENTED/ NETWORKS CAN BE PROCESSED, SOME CONFUSION COULD RESULT IN THE INTERPRETATION OF THE PROGRAM OUTPUTS. SECOND, THE PROGRAMS HAVE BEEN WRITTEN TO ANALYZE NETWORKS WITH A MAXIMUM OF 1,500 ACTIVITIES. THIRD, RANDOM NUMBERING OF NETWORK ACTIVITIES IS NOT PERMISSIBLE. EVENTS MUST BE NUMBERED SEQUENTIALLY IN ASCENDING ORDER. THE SUCCESSOR EVENT NUMBER OF AN ACTIVITY MUST BE HIGHER THAN ITS PREDECESSOR. CONSIDERATION OF THESE REQUIREMENTS IS IMPORTANT WHEN PREPARING THE BASIC NETWORK DRAWINGS.

THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH.

7070-01.9.005 TAXIS AVAILABLE 1ST QUARTER 1963. SPECIFY FILE NUMBER 7070-01.9.005

\*M

AUTHOR...J. K. KAUFMAN  
IBM CORPORATION  
618 SOUTH MICHIGAN  
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DIRECT INQUIRIES TO AUTHOR

TO PERFORM CRITICAL PATH ANALYSIS OVER NETWORKS OF UP TO 2000 ACTIVITIES, INVOLVING NO MORE THAN 1000 EVENTS OR NODES. 10 K MEMORY, 7501 CONSOLE CARD READER, 8 TAPES, FOUR ON EACH OF 2 CHANNELS. TAXIS INCLUDES AN UPDATING ROUTINE /TO INTRODUCE CHANGES INTO ANY NUMBER OF OLD NETWORKS/. THE PROCESSED NETWORKS ARE SORTED UP TO 5 TIMES BY KEYS DEFINED BY THE USER, AND WRITTEN IN EDITED FORM FOR LISTING. ESTIMATED TIME FOR A COMPLETE RUN OF 500 ACTIVITIES INCLUDING 2 SORTS IS SLIGHTLY LESS THAN 3 MINUTES. THE INPUT ORDER IS ENTIRELY INDEPENDENT OF NETWORK TOPOLOGICAL ORDER, AND EVENT DESIGNATIONS ARE NAMES /OF UP TO 10 CHARACTERS/ RATHER THAN SERIAL NUMBERS.

THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH.

7070-01.9.007 LOOP MACRO AVAILABLE 2ND QUARTER 1964. SPECIFY FILE NUMBER 7070-01.9.007

AUTHOR...D.R. FITZWATER

1410-14.3.003 MOST- MULTIPLE OPERATIONS SCHEDULING TECHNIQUE AVAILABLE 4TH QUARTER 1965. SPECIFY FILE NUMBER 1410-14.3.003

\*M

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DIRECT INQUIRIES TO AUTHOR

MOST IS OFFERED AS A SOLUTION TO THE PROBLEM OF SCHEDULING COMPUTER TIME IN ANY INSTALLATION. THE MOST PROGRAMS, USING NETWORK ACTIVITY, PRODUCE A DAY-BY-DAY MACHINE LOADING SCHEDULE FOR AN ENTIRE MONTH. WITH A 40K 1410 AND A RESIDENT MONITOR SIZE OF JUST UNDER 12K, THE LARGEST NETWORK ALLOWED IS 3000 ACTIVITIES. THE USER MAY SCHEDULE THE LOADING OF UP TO 99 LIKE MACHINES IN EACH OF UP TO FIVE LEVELS OF UPWARDS COMPATIBILITY WITHIN UP TO THREE SEPARATE CLASSES OF MACHINES. IN OTHER WORDS, UP TO 99 EACH OF 15 SEPARATE MACHINE TYPES CAN BE SCHEDULED.

THE 1410 PROGRAMS RUN UNDER CONTROL OF THE 1410/7070 OPERATING SYSTEM, THEREFORE THE 1410 MUST HAVE AT LEAST 40K, AND THE PRIOR TO PROCESS OVERLAP SPECIAL FEATURES. SIX TAPE DRIVES INCLUDING AN MDM FILE, BUT EXCLUDING AN SIU ARE REQUIRED.

THERE ARE TWO 1401 PROGRAMS WHICH REQUIRE TWO TAPE UNITS, 8K, AND A 1401 PRINTER, MODEL 2, IF THE INTERVENING SORT IS TO BE DONE ON THE 1401, A MINIMUM OF TWO EXTRA TAPE UNITS ARE REQUIRED. THE 1410 PROGRAMS ARE WRITTEN IN OPERATING SYSTEM AUTOCODER, ONE 1401 PROGRAM IS WRITTEN IN COBOL /4K/, THE OTHER IN TAPE AUTOCODER.

THE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH.

1410-14.9.001 CRITICAL PATH - MANPOWER AND RESOURCES SCHEDULING AVAILABLE 1ST QUARTER 1965. SPECIFY FILE NUMBER 1410-14.9.001

\*M

AUTHORS..R.A. ROOT R.E. MEYERS  
DIRECT INQUIRIES TO..  
R.A. ROOT  
IBM CORP.  
3424 WILSHIRE BOULEVARD  
LOS ANGELES, CALIF. 90005

THIS IS A SYSTEM COMPRISED OF SEVERAL PROGRAMS. THESE PROGRAMS EDIT INPUT DATA, CALCULATE CRITICAL PATH, MANPOWER AND RESOURCES SCHEDULES, AND GENERATE REPORTS AS DESIRED. THE SYSTEM WILL HANDLE UP TO 10,000 NODES, 0001 THROUGH 9999. IT ACCOMMODATES A MINIMUM OF 300 JOBS IN WAITING OR IN PROGRESS AT ANY GIVEN TIME. SIXTY-THREE CRAFTS, EACH WITH THREE SHIFT POOLS, ARE AVAILABLE. MINIMUM CONFIGURATION IS 40K, 1410, SIX TAPES, 1402, AND 1403. ALL PROGRAMS ARE CODED FOR 1410/7070 OPERATING SYSTEM. TAPES MAY BE SUBSTITUTED FOR 1402 AND 1403. USED WITH 1301 DISK FILE THREE TAPES, 1402 AND 1403 /OR TWO TAPES/ ARE REQUIRED. SAMPLE PROBLEM ILLUSTRATES ALL OUTPUT REPORTS.

THE TWO REELS OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED. THE TAPES PROVIDED MUST BE 2400 FEET IN LENGTH.

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## 7070

7070-01.1.002 AUTOCODER DECISION TABLE ASSEMBLER AVAILABLE 1ST QUARTER 1965. SPECIFY FILE NUMBER 7070-01.1.002

\*M

AUTHOR...H.I. MEYER  
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DIRECT INQUIRIES TO AUTHOR

TO EXTEND THE 7070 AUTOCODER LANGUAGE TO ALLOW DECISION TABLE FORMAT TO BE USED WITHIN THE ASSEMBLY LANGUAGE. THE ADVANTAGES ARE THAT IT ALLOWS THE PROGRAMMER TO USE DECISION TABLES AS A PROGRAMMING TOOL TO GIVE A COMPACT READABLE REPRESENTATION OF COMPLICATED LOGICAL RELATIONS. DECISION TABLE STATEMENTS ARE WRITTEN IN STANDARD AUTOCODER LANGUAGE EXCEPT THAT CARD COLUMNS 61-75 ARE RESERVED FOR ENTRY SYMBOLS. THEY MAY BE INCORPORATED INTO ANY AUTOCODER PROGRAM. A SEPARATE 1401 PROGRAM IS PROVIDED TO SELECTIVELY LIST THE DECISION TABLES WITHIN A PROGRAM IN A LEGIBLE FORMAT FOR DOCUMENTATION. METHOD- SOURCE LANGUAGE, 7070 AUTOCODER 1401 SPS. RESTRICTIONS/RANGE- THE DECISION TABLES ALLOW FOR UP TO 15 COLUMNS IN THE CONDITION ENTRY MATRIX. A MAXIMUM OF 50 LINES IS ALLOWED FOR ACTION STATEMENTS AND EXIT STATEMENTS. REGULAR AUTOCODER LANGUAGE IS USED IN THE TABLES BUT STATEMENTS ARE RESTRICTED IN LENGTH TO CARD COLUMN 60. LOGIC MACRO FORMAT IS USED FOR CONDITION STATEMENTS- THE LAST LINE OF EACH OF THESE MACROS IS LIMITED TO COLUMN 57 /WITHOUT YES-NO EXITS/. COMMENT CARDS MAY BE USED TO HEAD A TABLE BUT MAY NOT BE USED IN THE CONDITION SUB OR BEFORE THE FIRST ACTION STATEMENT. STORAGE REQUIREMENTS- 7070 DECISION TABLE ASSEMBLER - 4886 WORDS. 1401 DECISION TABLE LIST PROGRAM - 1555 POSITIONS CORE. EQUIPMENT SPECIFICATIONS- 5K 7070 W/6 TAPE UNITS. 4K 1401, HI-LO-EQUAL COMPARE, SENSE SWITCHES, 1402 CARD READER PUNCH.

THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH.

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DIRECT INQUIRIES TO..  
THOMAS R. JOHNSTON  
AMES LABORATORY  
IOWA STATE UNIVERSITY  
AMES, IOWA

THE LOOP MACRO WILL GENERATE THE APPROPRIATE AUTOCODER INSTRUCTIONS TO INCREMENT AND TEST FOR BRANCHING, THE SUBSCRIPTED VARIABLES DEFINED BY THE PROGRAMMER OR BY THE INDEX MACRO. MACHINE REQUIREMENTS- IBM 7070/2/4 WITH MAXIMUM OF 10,000 WORDS OF CORE AND AUTOCODER 76 COMPILATION CAPABILITY.

7070-01.9.008 INDEX MACRO \*M  
AVAILABLE 2ND QUARTER 1964.  
SPECIFY FILE NUMBER 7070-01.9.008

AUTHOR...D.R. FITZWATER

DIRECT INQUIRIES TO..  
THOMAS R. JOHNSTON  
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THE INDEX MACRO GENERATES INSTRUCTIONS WHICH DEFINE SUBSCRIPTED VARIABLES FOR USE BY THE PROGRAMMER. THE SUBSCRIPTED VARIABLES REFER TO ELEMENTS OF A LIST STRUCTURE. INDEX WILL SUPPLY AUTOMATICALLY, THE PROPERLY INITIALIZED INDEX REGISTERS WHICH ARE REQUIRED FOR REFERENCING SPECIFIED LIST STRUCTURES ON ANY LEVEL. THIS PROCESS CAN BE EQUIVALENT TO, BUT MORE FLEXIBLE THAN, FORTRAN SUBSCRIPT OPERATIONS. IT RESULTS IN A MORE EFFICIENT PROGRAM AND GIVES THE PROGRAMMER GREATER FLEXIBILITY IN REFERENCING THE DATA AND, IF DESIRED, IN MODIFYING THE DATA STRUCTURE. MACHINE REQUIREMENTS- IBM 7070/2/4 WITH MAXIMUM OF 10,000 WORDS OF CORE AND AUTOCODER 76 COMPILATION CAPABILITY.

THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL \*M\* BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH.

7070-02.5.001 BINARY SEARCH MACRO  
AVAILABLE 1ST QUARTER 1964.  
SPECIFY FILE NUMBER 7070-02.5.001

AUTHOR...P.H. COLLINS  
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DIRECT INQUIRIES TO AUTHOR

A MACRO TO GENERATE A ROUTINE TO SEARCH AN ORDERED FILE FOR AN EQUAL OR HIGH. THE ROUTINE PERFORMS THE SAME FUNCTION AS LOOKUP EQUAL OR HIGH. ON LARGE FILES THE REDUCTION OF PROCESSING TIME IS SIGNIFICANT. FOR A TABLE OF 1000 RECORDS THE AVERAGE SEARCH TIME IS 1.3 MILLISECOND COMPARED TO 54.1 MILLISECOND FOR LOOKING EQUAL.

7070-02.5.002 7070/7074 TABLE LOOK UP  
MACRO FOR THE IBM 7074  
AVAILABLE 1ST QUARTER 1965.  
SPECIFY FILE NUMBER 7070-02.5.002

AUTHORS..R. CAUCHE C. PERRIER

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RUE REAUMUR  
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THIS MACRO GENERATES A SEARCH OF A TABLE OF FIXED OR VARIABLE LENGTH IN ASCENDING SEQUENCE. IF THE TABLE INCLUDES MORE THAN 100 ARGUMENTS, THE SEARCH STARTS BY BINARY SEARCH WITH A DECREMENT COMPUTED. IT ENDS BY A BASIC 7070 TABLE LOOK UP INSTRUCTION WHEN THE DURATION OF THIS CODE IS LOWER THAN THE NECESSARY TIME TO EXTINGUISH THE TABLE BY THE BINARY SEARCH METHOD. MINIMUM MACHINE CONFIGURATION FOR FULL AUTOCODER. SOURCE LANGUAGE IS MACRO GENERATOR AND FULL AUTOCODER.

7070-02.9.001 MODULUS 11 SELF-CHECKING  
DIGIT CALCULATOR  
AVAILABLE 1ST QUARTER 1963.  
SPECIFY FILE NUMBER 7070-02.9.001

AUTHOR...ALEX SERBINOFF  
IBM DATACENTER  
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CLEVELAND 15, OHIO

DIRECT INQUIRIES TO AUTHOR

TO AFFIX MODULUS 11 SELF-CHECKING DIGITS TO NUMBERS OVER A PREDETERMINED RANGE OR SERIES OF RANGES. 5 K FOUR TAPE 7070 WITH PROGRAM TO BE BROUGHT IN FROM ADDITIONAL TAPE, CARD READER, OR CONSOLE CARD READER. THE PROGRAM IS DESIGNED TO COMPILER CHECK DIGITS FOR NUMBERS OF FROM ONE TO NINE DIGITS. A COUNT AND HASH TOTAL OF VALID NUMBERS IS INCLUDED FOR CONTROL PURPOSES. THE PROGRAM CALCULATES CHECK DIGITS AT A RATE OF 900 PER SECOND.

7070-02.9.002 LURE -- LIBRARY UPDATING  
ROUTINE PACKAGE \*M  
AVAILABLE 1ST QUARTER 1963.  
SPECIFY FILE NUMBER 7070-02.9.002

AUTHORS..DAVID FORST JEAN LISKA

CONTINUED FROM PRIOR COLUMN--

DIRECT INQUIRIES TO..  
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IBM CORP.  
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2 BROADWAY  
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TO GENERATE, MAINTAIN, UPDATE AND DOCUMENT A 7070 LIBRARY TAPE. 1401 MODEL C WITH NO ADVANCED PROGRAMMING OR HIGH-LOW-EQUAL COMPARE FEATURE. A 7070-7074 WITH TWO OR MORE CHANNELS, A MINIMUM OF 4 TAPE DRIVES AND A CONSOLE CARD READER.

THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL \*M\* BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH.

7070-03.1.002 INSTANT PROGRAM-LOADING  
AVAILABLE 2ND QUARTER 1964  
SPECIFY FILE NUMBER 7070-03.1.002

AUTHOR...H.E. KOMNICK  
IBM CORP.  
1300 S. FOURTH ST.  
LOUISVILLE, KY.

DIRECT INQUIRIES TO AUTHOR

THIS PROGRAM LOADS A 5-K 7070 PROGRAM IN LESS THAN A SECOND. ABOUT 100 WORDS ARE USED BY THE PROGRAM, WHICH WILL- /1/ SEARCH THE SYSTEM TAPE FOR A SPECIFIC PROGRAM, /2/ CREATE A NEW SYSTEM TAPE, /3/ OR WRITE AN UPDATED SYSTEM TAPE, PROVIDING THE ABILITY TO ADD, DELETE, OR PATCH PROGRAMS. IT WILL HANDLE PROGRAMS WITH OVERLAYS AS WELL AS THOSE WITHOUT OVERLAYS. THE PROGRAM AS WRITTEN IS FOR A 5-K TWO-CHANNEL 7070 SYSTEM BUT CAN EASILY BE MODIFIED FOR OTHER CONFIGURATIONS.

7070-03.2.003 TOPSY - TAPE OPERATING \*M  
SYSTEM  
AVAILABLE 1ST QUARTER 1964.  
SPECIFY FILE NUMBER 7070-03.2.003

AUTHOR...J.M. GIFFIN

DIRECT INQUIRIES TO..  
J.J. LINT  
IBM CORP.  
202 N.E. MONROE ST.  
PEORIA, ILL.

TOPSY IS A TAPE-ORIENTED SUPERVISORY CONTROL SYSTEM WHICH PERMITS USERS TO SEARCH, LOAD, AND EXECUTE PROGRAMS FROM MULTIPLE SOURCES WITH A MINIMUM OF MANUAL INTERVENTION. IT IS DESIGNED TO SCHEDULE THE OPERATION OF A NUMBER OF INDIVIDUAL AND POSSIBLY UNRELATED PROGRAMS AS A CONTINUOUS FLOW WORK THROUGH THE COMPUTER, AND TO MAINTAIN A DESCRIPTIVE CONSOLE LOG OF THE WORK FLOW. LOADING AND EXECUTION OF PROGRAMS MAY BE INITIATED BY AN OPERATING STATEMENT READ FROM ANY INPUT DEVICE, OR A PROGRAMMED ENTRY. PROGRAM SEARCHING OF THE SYSTEM TAPE IS BI-DIRECTIONAL AND MAY OPERATE CONCURRENTLY WITH OTHER PROGRAMS.

REQUIRES A 7070/2/4 WITH 3 TAPES, OR 2 TAPES AND A CARD READER, PLUS 2 MORE TAPES FOR TOPSY MAINTENANCE, AND A 1401 PERIPHERAL COMPUTER. RESERVED FOR THE EXCLUSIVE USE OF THE SYSTEM ARE- 190 WORDS OF STORAGE, INDEX WORDS 1, 2, 95, AND 96-PRIORITY BRANCH LOCATION 0159-AND LOCATION 0000. WRITTEN IN AUTOCODER.

BASIC PROGRAM CONSISTS OF TWO TAPES---TAPE 1 CONTAINS THE TOPSY SYSTEM AND TAPE 2 CONTAINS SOURCE CARDS AND ASSEMBLY LISTINGS. \*  
THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*  
REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES \*  
PROVIDED MUST BE 2400 FEET IN LENGTH. \*

7070-03.2.004 PEST - PITT EXECUTIVE SYSTEM \*M  
FOR TAPES  
AVAILABLE 1ST QUARTER 1964.  
SPECIFY FILE NUMBER 7070-03.2.004

AUTHOR...R.W. RANSHAW  
COMPUTATION AND DATA PROCESSING CENTER  
UNIVERSITY OF PITTSBURGH  
PITTSBURGH 13, PA.

DIRECT INQUIRIES TO AUTHOR

PEST IS A MASTER OPERATING SYSTEM FOR THE 7070/2/4 WHICH ACCEPTS AS INPUT UNRELATED JOBS WHICH MAY REQUIRE ASSEMBLY, COMPILATION, EXECUTION, AND/OR THE EXECUTION OF A PRODUCTION PROGRAM WHICH HAS BEEN INCLUDED IN THE SYSTEM. WHENEVER POSSIBLE, JOBS ARE RUN WITHOUT OPERATOR INTERVENTION. OPERATOR ACTION IS NECESSARY ONLY IF TAPES HAVE TO BE MOUNTED OR CHANGED, IF A MACHINE OR PROGRAM ERROR OCCURS, OR IF A JOB REQUIRES ANY SPECIAL SET-UP. MACHINE REQUIREMENTS-10K OF STORAGE- FLOATING HARDWARE- 6 MODEL 729 II, IV, V; OR VI TAPE DRIVES- INTERVAL TIMER /PROVISION TO DELETE THIS- 4-4K1401 WITH ADVANCED PROGRAMMING, INDEX REGISTERS, AT LEAST 1 TAPE. THE FLOATING POINT REQUIREMENT MAY BE CIRCUMVENTED FOR FORTRAN PROGRAMS. THERE IS NO SET LOCATIONS FOR A RESIDUAL PORTION OF THE MONITOR. A SUBROUTINE IS PROVIDED WHICH WILL RETURN CONTROL TO THE SYSTEM.

THE SYSTEM IS COMPRISED OF A CONTROL PROGRAM, A FORTRAN COMPILER, AUTOCODER 74, A SYMBOLIC SUBROUTINE LIBRARY, AND A MACHINE-LANGUAGE PRODUCTION-PROGRAM LIBRARY, ALL ON ONE TAPE. THE CONTROL PROGRAM PROCESSES CONTROL CARDS /PROVIDED BY EACH USER/ AND DIRECTS CONTROL TO THE APPROPRIATE PROCESSOR. THE FORTRAN COMPILER /FORT-PITT/ IS A HYBRID BETWEEN FULL AND BASIC FORTRAN PLUS SOME ADDITIONAL FEATURES. IT PROVIDES HIGH COMPILING SPEED AND, IN MANY INSTANCES, BETTER TRANSLATION. MANY SUBROUTINES AND MACROS HAVE BEEN WRITTEN FOR THE A74 LIBRARY, INCLUDING MIN-MAX A RANDOM NUMBER GENERATOR, RANGE-KUTTA-GILL SOLUTION OF DIFFERENTIAL EQUATIONS, AN IOCS-LIKE TAPE HANDLING SYSTEM, AND MANY INPUT/OUTPUT ROUTINES. THE STANDARD IBM IOCS IS ALSO PRESENT.

BASIC PROGRAM MATERIAL CONSISTS OF 4 TAPES---SYSTEM TAPE, SYMBOLIC \*  
LISTINGS, CONDENSED AND SYMBOLIC DECKS AND SAMPLE RUNS. \*  
THE NUMBER OF TAPES INDICATED MAY BE ORDERED FROM YOUR IBM \*

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CONTINUED FROM PRIOR PAGE--  
REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS ORDERED. THE TAPES \*  
PROVIDED MUST BE 2400 FEET IN LENGTH.

CONTINUED FROM PRIOR COLUMN--  
DIRECT INQUIRIES TO AUTHOR

7070-03.2.005 PILOT PROGRAM TAPE SYSTEM  
AVAILABLE 2ND QUARTER 1964.  
SPECIFY FILE NUMBER 7070-03.2.005

AUTHOR...HENRY L. COGN  
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DIRECT INQUIRIES TO AUTHOR

PILOT IS A BASIC PROGRAM TAPE SUPERVISORY SYSTEM WHICH HANDLES  
LOADING OF INSTALLATION PROGRAMS AND SUBROUTINES FROM A SYSTEM  
TAPE. COMPONENTS OF THE SYSTEM INCLUDE THE SEARCH ROUTINE, WHICH  
IS RESIDENT IN MEMORY, AND THE SYSTEM RUN WHICH UPDATES THE  
SYSTEM TAPE. MINIMAL MACHINE REQUIREMENTS- 5K 7070 WITH CARD  
READER AND FOUR TAPE DRIVES. THREE OF THESE TAPES ARE USED ONLY  
FOR THE SYSTEM RUN. MEMORY REQUIRED FOR THE SEARCH ROUTINE IS 125  
WORDS.

7070-03.4.004 PILOT TAPE PRINT PROGRAM  
AVAILABLE 2ND QUARTER 1964.  
SPECIFY FILE NUMBER 7070-03.4.004

AUTHORS..W.C. GOODLETT J.E. ZOLLINGER

DIRECT INQUIRIES TO..  
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IBM CORP.  
220 CHURCH ST.  
NEW YORK 13, N.Y.

THE PILOT TAPE PRINT PROGRAM IS THE IBM TAPE PRINT  
PROGRAM SPECIFICALLY MODIFIED FOR USE WITH THE PILOT PROGRAM TAPE  
SYSTEM. AFTER THE PROGRAM IS LOADED FROM THE PILOT PROGRAM  
TAPE, THE OPERATOR MAY- /1/ DISCONTINUE EXECUTION ALTOGETHER-  
/2/ WRITE TAPE MARKS ON ANY CHANNEL 1 TAPE UNITS- /3/ WRITE TAPE  
MARKS ON ANY CHANNEL 2 TAPE UNITS- AND /4/ TAPE PRINT/ TAPE  
FILES FROM THE CONSOLE AND/OR A CONTROL CARD. REQUIREMENTS-  
5000 WORDS OF MEMORY, THREE TAPE UNITS AND A CARD READER.  
SOURCE LANGUAGE- FULL AUTOCODER.

7070-03.4.005 TAPE FILE SEARCH ON THE IBM  
7070-7074

AVAILABLE 2ND QUARTER 1963.  
SPECIFY FILE NUMBER 7070-03.4.005

AUTHOR...M.J. JANNACE  
IBM CORP.  
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1776 PENNSYLVANIA BLVD.  
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DIRECT INQUIRIES TO AUTHOR

THE 7074 PROGRAM POSITIONS A TAPE AT THE BEGINNING OF A  
DESIRED FILE WHERE FILES ARE SEPARATED BY A SINGLE TAPE  
MARK. IT IS USED TO SAVE TAPE MOUNTING TIME WHERE CHANGING  
PROGRAM TAPES IS COMPARATIVELY FREQUENT. ANY 7070 OR 7074  
CONFIGURATION WITH TAPE. /1/ IT IS WRITTEN FOR CONSOLE CARD  
READER. ONE LOCATION MUST BE CHANGED FOR A 7500 CARD  
READER/.

7070-03.9.001 INVALID ALPHA SEARCH PROGRAM  
FOR TAPE CHECKPOINT WRITE FAILURES FOR 7070/72/74

AVAILABLE 2ND QUARTER 1963.  
SPECIFY FILE NUMBER 7070-03.9.001

AUTHOR...ROY W. WABERRY  
IBM CORP.  
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GREEN BAY, WISCONSIN

DIRECT INQUIRIES TO AUTHOR

TO LOCATE ANY ILLEGAL ALPHA CHARACTERS PRESENT IN MEMORY WHEN A  
USERS PROGRAM HAS BEEN INTERRUPTED BY REPEATED WRITE  
FAILURES AT TAPE CHECKPOINT. THE CHECK FOR ILLEGAL ALPHA  
CHARACTERS AT CHECKPOINT WRITE FAILURES IS NOT PROVIDED BY IOCS.  
THE SEARCH PROGRAM IS LOADED AND EXECUTED IN MEMORY WORDS NOT  
NORMALLY EMPLOYED BY MOST USER OPERATING PROGRAMS; THUS  
PERMITTING THE CONTINUATION OF THE INTERRUPTED PROGRAM AFTER THE  
ILLEGAL ALPHA CHARACTERS HAVE BEEN CORRECTED. THE INVALID  
ALPHA SEARCH PROGRAM ASSUMES THE FOLLOWING- 1. A MEMORY SIZE  
OF 10K. 2. THE INTERRUPTED PROGRAM CONTAINS A UTILITY LOAD  
PROGRAM IN MEMORY LOCATIONS 0308-0232 AND HAS RESERVED INDEX  
WORDS 0001 AND 0002 FOR USE BY THE LOAD PROGRAM. 3. THE  
INTERRUPTED PROGRAM DOES NOT USE MEMORY LOCATIONS 0200-0299 WITH  
THE EXCEPTION OF 7300 DISK STORAGE PRIORITY STATUS AND BRANCH  
LOCATIONS. THE ABOVE ASSUMPTIONS MAY BE READILY ALTERED BY THE  
USER THROUGH ASSEMBLY OF THE SEARCH PROGRAM. MACHINE  
CONFIGURATIONS- 1. 7070/7072/7074. 2. 10K MAGNETIC CORE  
STORAGE. 3. CARD/TAPE OR TAPE ORIENTATED SYSTEM. SOURCE  
LANGUAGE- IS AUTOCODER 76. PROGRAM EXECUTE TIME VARIES DIRECTLY  
WITH NUMBER OF ALPHA WORDS IN MEMORY. THE PROGRAM HAS BEEN  
THOROUGHLY TESTED OUT AND USED A NUMBER OF TIMES UNDER ACTUAL  
OPERATING CONDITION.

7070-03.9.002 TYPWR /TYPEWRITE/ MACRO  
GENERATOR FOR THE IBM 7070 SERIES COMPILER SYSTEMS AUTOCODER  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 7070-03.9.002

AUTHOR...PAUL F. MAY  
IBM CORPORATION  
2925 EUCLID AVENUE  
CLEVELAND 15, OHIO

THE TYPWR /TYPEWRITE/ MACRO GENERATOR PRODUCES A TYP /TYPE/ AND  
NOP/NO OPERATION/, OR TYP AND B/BRANCH/, IN-LINE IN A COMPILED  
PROGRAM, AND THE NECESSARY ROW /RECORD DEFINITION WORD/ AND DC  
/DEFINE CONSTANT/ OUT-OF-LINE, WHEN A MACRO STATEMENT WITH THE  
GENERAL FORMAT ANYLABEL TYPWR # ALPHAMERIC LITERAL#, BRANCHADDR  
IS WRITTEN IN A 7070 AUTOCODER SOURCE PROGRAM. CAN HANDLE ANY  
ALPHAMERIC LITERAL AS DEFINED BY AUTOCODER. MACHINE  
CONFIGURATION- AS REQUIRED TO USE THE IBM 7070/72/74 COMPILER  
SYSTEMS TAPE. SOURCE LANGUAGE- AUTOCODER

7070-03.9.003 DUMPI SORT 90 PHASE-ONE  
RESTART AND CHECKPOINT 7074-7070  
AVAILABLE 3RD QUARTER 1964.  
SPECIFY FILE NUMBER 7070-03.9.003

AUTHOR...RICHARD E. VLAHA  
IBM CORP.  
7321 W. LAKE ST.  
RIVER FOREST, ILL.

DIRECT INQUIRIES TO AUTHOR

DUMPI WAS WRITTEN TO ENABLE RESTART IN PHASE ONE OF SORT 90  
FOR IBM 7070-7074. THIS WAS NECESSARY BECAUSE OF EXTENSIVE  
PHASE ONE RUNNING TIME. THESE MODIFICATIONS WERE TESTED WITH V2  
ML 3 OF THE SORT. THE MODIFICATIONS REQUIRE ONLY THREE WORDS OF  
STORAGE. THE ROUTINE REQUIRES USE OF A CONSOLE CARD READER. ALL  
SOURCE ENTRIES WERE WRITTEN IN AUTOCODER 76. THESE MODIFICATIONS  
GIVE FULL RESTART AND CHECKPOINT CAPABILITIES.

7070-03.9.004 SEAP- FILE SEARCH AND PRINT  
FOR THE IBM 7070/72/74  
AVAILABLE 4TH QUARTER 1965.  
SPECIFY FILE NUMBER 7070-03.9.004

AUTHORS..T. FUJITA Z. SHIMIZU

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SEAP CAN SEARCH ANY TAPE FILE WITH FORM 1, 2 OR 3 TO EXTRACT THE  
RECORDS SATISFYING GIVEN CONDITIONS. THE CONDITIONS ARE GIVEN BY  
CONTROL CARDS AND THE OUTPUT IS DUMP LIST OF THE RECORDS FOUND.  
EACH CONDITION IS A LOGICAL STATEMENT CONCERNING DATA FIELDS  
WITHIN A RECORD. A SEQUENTIAL OR OTHER RELATIONAL STATEMENT  
BETWEEN DATA RECORDS IS NOT APPLICABLE TO THIS PROGRAM. ALSO, A  
RELATIONAL STATEMENT BETWEEN DATA FIELDS WITHIN A RECORD IS NOT  
APPLICABLE. THE MACHINE REQUIREMENTS ARE- AN IBM 7070/72/74 WITH  
10,000 WORDS OF CORE, A MINIMUM OF TWO TAPE DRIVES AND AN IBM  
7501 CONSOLE CARD READER.

OPTIONAL PROGRAM MATERIAL CONSISTS OF THE PROGRAM LISTINGS  
AVAILABLE ON ONE REEL OF MAGNETIC TAPE. THIS TAPE MAY BE ORDERED  
FROM YOUR IBM REPRESENTATIVE OR SUPPLIED FOR EACH ITEM THAT IS  
ORDERED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH.

7070-04.3.003 AUTO-TEST GENERATOR  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 7070-04.3.003

AUTHORS..W. CRANE H.N. FLIEGELMAN

DIRECT INQUIRIES TO..

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THE ATG PROGRAM GENERATES TAPES FOR AUTOMATIC, TAPE-ORIENTED  
PROGRAM TESTING. IN DOING SO, ALL INPUT IS EDITED, CONTROL CARDS  
ARE CHECKED, AND DESIRED UTILITY PROGRAMS ARE COMBINED WITH THE  
USER'S PROGRAMS TO CREATE A SINGLE TAPE FOR QUICK, EFFICIENT, AND  
FLEXIBLE PROGRAM TESTING. MACHINE CONFIGURATION- MINIMUM 5K  
7070, 72, 74 WITH ONE CHANNEL AND 3 TAPES.  
MAXIMUM- 10K 7070, 72, 74 WITH 4 CHANNELS, 40 TAPES, 7500 CARD  
READER, 7501 CONSOLE CARD READER, 7500 CARU PUNCH, 7400 ON-LINE  
PRINTER. SOURCE LANGUAGE AUTOCODER 76. THIS PROGRAM REPLACES  
7070-AT-083.

7070-04.9.002 SCAN  
AVAILABLE 1ST QUARTER 1963.  
SPECIFY FILE NUMBER 7070-04.9.002

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DIRECT INQUIRIES TO AUTHOR

VERSION II- TO EDIT BASIC FORTRAN PROGRAMS PRIOR TO DOING A  
FORTRAN ASSEMBLY. BASIC 7070. PROGRAM IS SET UP TO ACCEPT  
INFORMATION FROM A CARD READER OR A TAPE UNIT. THIS PROGRAM WILL  
FIND MANY COMMON ERRORS IN FORTRAN PROGRAMS. OVER EIGHTY ERRORS  
ARE CAUGHT BY THIS ROUTINE. FOR EXAMPLE- 1. MIXED ARITHMETIC  
MODE. 2. DIMENSIONED VARIABLE WRITTEN WITHOUT SUBSCRIPTS.  
3. INTERSECTING DO LOOPS. 4. MISPLACED COMMAS IN CONTROL  
STATEMENTS. 5. UNFILLED BRANCHES AND DO/S. 6. NAMES THAT ARE  
USED BUT NEVER DEFINED. ANY STATEMENT ACCEPTABLE TO BASIC  
FORTRAN VERSION II CAN BE PROCESSED BY THIS PROGRAM. IT WILL  
PROCESS AT CARD READ SPEED.

7070-04.9.003 SCANDAL - A SYNTACTICAL  
SCANNER FOR 7070/72/74 FORTRAN  
AVAILABLE 2ND QUARTER 1964.  
SPECIFY FILE NUMBER 7070-04.9.003

AUTHORS..C. FORNEY, JR. C.M. SMITH, JR.



# Contributed Programs

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CONTINUED FROM PRIOR PAGE--

DIRECT INQUIRIES TO..  
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SCANDAL MAY BE ENTERED AS A LOAD ON THE COMPILER SYSTEM TAPE. IT SERVES TO DETECT SYNTACTICAL ERRORS IN FORTRAN SOURCE PROGRAMS AND REPORT SUCH ERRORS IN A READABLE FORM USING THE LISTTAPE PROVISION IS MADE TO BYPASS COMPILATION OF FORTRAN PROGRAMS CONTAINING SUCH ERRORS. MACHINE REQUIREMENTS 10K STORAGE, 7 MAGNETIC TAPE UNITS PLUS 7500 CARD READER OR 1 ADDITIONAL MAGNETIC TAPE UNIT.

CAPABILITIES AND LIMITATIONS-- SCANDAL HAS BEEN USED EFFECTIVELY IN PROCESSING THOUSANDS OF SOURCE PROGRAMS AT THE CONTRIBUTING INSTALLATION. NO EXAMPLE EXCEEDING THE TABLE CAPACITIES OF SCANDAL HAS BEEN ENCOUNTERED. WITH VERY FEW EXCEPTIONS, THE FORTRAN SYNTACTICAL STRUCTURES ALLOWED BY SCANDAL ARE THOSE WHICH ARE CORRECTLY COMPILED BY THE COMPILER SYSTEMS TAPE. OTHER SYSTEMS ON THE COMPILER SYSTEMS TAPE ARE NOT AFFECTED. MULTIFILE RUNS ARE PERMITTED BUT A DECKTAPE MUST BE SPECIFIED. A LISTTAPE MUST BE SPECIFIED AND PROVIDED. TAPE UNIT II MAY NOT BE USED AS MAIN UNIT. THE SYSTEMS RUN DECK TO ENTER SCANDAL ON THE COMPILER SYSTEMS TAPE IS PROVIDED WITH THIS WRITEUP-- THE OPTION CARDS NECESSARY FOR ANY GIVEN SYSTEM ARE NOT INCLUDED. A TAPE IS ALSO AVAILABLE UPON REQUEST WITH THE SOURCE PROGRAM, ASSEMBLED LISTING AND SYSTEM RUN DECK ON IT.

THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL \*M\*Y BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH.

7070-06.1.003 PERT MANAGEMENT CONTROL SYSTEM

AVAILABLE 1ST QUARTER 1963.  
SPECIFY FILE NUMBER 7070-06.1.003

AUTHOR...SHIRLEY INMAN  
COMPUTER TECHNIQUES DEPT.  
COLLINS RADIO COMPANY  
CEDAR RAPIDS, IOWA

DIRECT INQUIRIES TO AUTHOR

PERT 7070 IS A MANAGEMENT CONTROL TOOL WHICH DEFINES AND INTEGRATES THOSE PROCEDURES NECESSARY TO ACCOMPLISH PROGRAM OBJECTIVES ON TIME. THE PROGRAM HAS SEVERAL UNIQUE FEATURES-- /1/ THE OUTPUT HAS BEEN ORGANIZED TO INCORPORATE THE BEST ASPECTS OF BOTH EVENT-ORIENTED AND ACTIVITY-ORIENTED PRESENTATIONS-- /2/ THOSE ACTIVITIES AND EVENTS ON THE SO-CALLED CRITICAL PATH ARE FLAGGED-- /3/ THE PROGRAM PRINTS OUT FOR EACH EVENT OR ACTIVITY THE EXPECTED, LATEST AND COMPLETION DATES, THE ACTIVITY EXPECTED TIME, STANDARD DEVIATION OF THE ACTIVITY TIME ESTIMATES, ACTIVITY OR EVENT SLACK TIME, AND THE PROBABILITY OF COMPLETION OF AN EVENT OR SCHEDULE-- /4/ IT HAS THE ABILITY TO PROCESS BOTH MULTIPLE START EVENTS AND MULTIPLE END EVENTS.

THE PERT PROGRAM REQUIRES AN IBM 7070 COMPUTER WITH A STORAGE CAPACITY OF TEN THOUSAND WORDS, FLOATING POINT HARDWARE, AND TWO TAPE CHANNELS, WITH AT LEAST TWO TAPE DRIVES AVAILABLE PER CHANNEL. THE LOAD AND PRINT ROUTINES FOR THE 1401 ARE NECESSARY ADJUNCTS TO THE PERT 7070 PROGRAM. THE OPTIONS REQUIRED FOR THESE PROGRAMS CONSISTS OF A MODEL C3 WITH A FOUR THOUSAND POSITION CORE STORAGE 1401, A 1402 CARD READ-PUNCH, AND A 1403 PRINTER WITH THE SPECIAL PRINTING CAPACITY OF 132 POSITIONS. THE FOLLOWING SPECIAL FEATURES ARE USED BY THE PROGRAMS-- THE STORE ADDRESS REGISTER FEATURE-- THE MOVE RECORD FEATURE-- THE HIGH-LOW-EQUAL-COMPARE FEATURE-- AND THE COMPRESSED TAPE OPERATIONS FEATURE.

7070-06.1.004 LINEAR PROGRAMMING CODE S2

AVAILABLE 1ST QUARTER 1963.  
SPECIFY FILE NUMBER 7070-06.1.004

AUTHORS..A.R. WEISS D.C. POTTER A.E. SPECKHARD

DIRECT INQUIRIES TO--  
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IBM CORP.  
112 EAST POST ROAD  
WHITE PLAINS, N.Y.

THE LP CODE S2 IS MEANT TO IMPLEMENT THE LINEAR PROGRAMMING REVISED SIMPLEX PRODUCT FORM ANALYSIS ON THE IBM 7070/74. 10K, 2 CHANNELS WITH THREE TAPE DRIVES EACH.

THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL \*M\*Y BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH.

7070-07.2.001 OHIO UNIVERSAL CULVERT DESIGN

AVAILABLE 4TH QUARTER 1964.  
SPECIFY FILE NUMBER 7070-07.2.001

AUTHOR...ROBERT A. SMITH  
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DIRECT INQUIRIES TO AUTHOR

A COMPUTER PROGRAM WHICH ASSIMILATES A GIVEN SET OF HYDROLOGICAL CONDITIONS FOR THE SELECTION OF A CULVERT AND FINDS THE MINIMUM SIZES OF CIRCULAR-CONCRETE, CIRCULAR-CORRUGATED METAL, ELLIPTICAL-CONCRETE, AND PIPE-ARCH CULVERTS WHICH WILL PASS A GIVEN DISCHARGE WITHOUT EXCEEDING AN ALLOWABLE HEADWATER. THE PROGRAM ALSO GIVES AN ANALYSIS OF SIZES JUST ADJACENT TO THE MINIMUM SIZES, FOR NORMAL AND FLOOD DISCHARGES, IN ORDER THAT THE TRANSITION OF FLOW FOR THE MINIMUM SIZE MAY BE SEEN. THE PROGRAM WAS ORIGINALLY WRITTEN FOR AN IBM 7070/7074 SYSTEM /TAPE/ WITH

CONTINUED FROM PRIOR COLUMN--

10,000 WORDS OF CORE AND FLOATING POINT HARDWARE. SINCE THE SOURCE LANGUAGE IS FORTRAN, THE PROGRAM CAN EASILY BE ADAPTED FOR RECOMPILATION ON OTHER COMPUTERS. ALL NOTATIONS AND SYMBOLS USED IN THE WRITE-UP ARE ARRANGED IN ALPHABETICAL ORDER AND EXPLAINED IN THE APPENDIX. WHEREVER THE SYMBOL ,,/XXXX, YYY/, APPEARS IN A SENTENCE, FIGURE, OR IN THE MARGIN NEXT TO A FORMULA, THE ,,/XXXX, IS A CROSS-REFERENCE TO A FORTRAN STATEMENT NUMBER IN THE SOURCE DECK LISTING SECTION AND THE ,,/YYY, IS A CROSS-REFERENCE TO A BLOCK IN THE DETAILED BLOCK DIAGRAM SECTION, I.E., /1010, BFF4/ REFERS TO FORTRAN STATEMENT NUMBER 10110 AND DETAILED BLOCK BFF4. THE WRITE-UP IS GROUPED INTO TWO PHASES. THE FIRST PHASE, USER/S GUIDE, CONTAINS THAT INFORMATION WHICH OUTLINES HOW ONE MUST SUBMIT INPUT FOR THE PROGRAM AND LATER INTERPRET THE CALCULATED RESULTS. THE SECOND PHASE, PROGRAM THEORY, PRESENTS THE METHODS AND LOGIC WHICH IS FOLLOWED BY THE PROGRAM IN TRAVERSING FROM THE GIVEN INPUT TO THE FINAL OUTPUT.

7070-07.5.001 A GENERAL STRUCTURE FACTOR PROGRAM FOR CRYSTALLOGRAPHY

AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 7070-07.5.001

AUTHOR...RYONOSUKE SHIONO  
THE CRYSTALLOGRAPHY LABORATORY AND  
COMPUTATION AND DATA PROC. CTR.  
UNIVERSITY OF PITTSBURGH  
PITTSBURGH 13, PENNSYLVANIA, U. S. A.

DIRECT INQUIRIES TO AUTHOR

TO CALCULATE THE STRUCTURE FACTORS OF CRYSTALS OF TRICLINIC, MONOCLINIC OR ORTHORHOMBIC CLASSES /AND ALSO OF HEXAGONAL, TETRAGONAL OR CUBIC WITH REDUNDANT ATOMS/. 10,000 CORES /OR 5,000 CORES/ 1 7500 /SYNCHRONIZER 1/ WITH IBM UTILITY BOARD 1 7500 /SYNCHRONIZER 1/ WITH IBM UTILITY BOARD 2 7400 /SYNCHRONIZER 2/ WITH IBM UTILITY BOARD 2 CHANNEL /1 AND /, 1 UNIT EACH MAXIMUM INDEX OF H, K, OR L PLUS OR MINUS 999 MAXIMUM NUMBER OF REFLECTIONS NONE MAXIMUM NUMBER OF ATOMIC SCATTERING CURVES EQUALS 13 MAXIMUM NUMBER OF ATOMS IN ONE PASS 1500 /OR 250 FOR 5000 CORES/

7070-07.5.003 THREE DIMENSIONAL DIFFERENTIAL FOURIER SYNTHESIS PROGRAM FOR CRYSTALLOGRAPHY

AVAILABLE 4TH QUARTER 1963.  
SPECIFY FILE NUMBER 7070-07.5.003

AUTHOR...DR. R. SHIONO  
CRYSTALLOGRAPHY LABORATORY  
UNIVERSITY OF PITTSBURGH  
PITTSBURGH 13, PA.

DIRECT INQUIRIES TO AUTHOR

USING THE OUTPUT TAPE OF PROGRAM 7.5.001, THIS PROGRAM CALCULATES THE ELECTRON DENSITIES, SLOPES AND CURVATURES OF THE GIVEN ATOMIC POSITIONS AND SOLVES THE SHIFTS FOR POSITIONAL PARAMETERS AND FOR THE ISOTROPIC OR ANISOTROPIC TEMPERATURE FACTORS. THE ESTIMATED STANDARD DEVIATIONS OF PARAMETERS ARE ALSO CALCULATED. MACHINE REQUIREMENTS--1/ 10 K CORE STORAGE 2/ AUTOMATIC FLOATING-POINT ARITHMETIC DEVICE. 3/ ONE TAPE CHANNEL /TAPE 21/ 4/ EITHER ONE OF THE FOLLOWING SET OF EQUIPMENTS A/ ONE 7500 CARD READER /SYN. 1/ ONE 7400 PRINTER /SYN. 2/ OR B/ TWO TAPE UNITS /TAPES 15 AND 22/ OR C/ TWO TAPE UNITS /TAPES 22 AND OTHER/ 7501 CONSOLE CARD READER. THE PROGRAM AUTOMATICALLY ADJUSTS ITSELF FOR ANY OF THE ABOVE MACHINE CONFIGURATIONS. LIMITATIONS--MAXIMUM VALUE OF INDEX H, K OR L TO BE USED IS 6 140. THERE MAY BE ANY NUMBER OF REFLECTIONS AS LONG AS ONE TAPE CAN RECORD /CA. 22,000/. MAXIMUM NUMBER OF ATOMS TO BE REFINED IN ONE PASS IS 99 WITH ISOTROPIC OR 45 WITH ANISOTROPIC TEMPERATURE FACTOR.

THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL \*M\*Y BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH.

7070-07.9.001 DATA PLOTTER

AVAILABLE 2ND QUARTER 1963.  
SPECIFY FILE NUMBER 7070-07.9.001

AUTHOR...LEONARD SPAR

DIRECT INQUIRIES TO..  
WILLIAM FANLEY  
MARATHON OIL CO.  
PROCEDURES RESEARCH DEPARTMENT  
FINDLAY, OHIO

TO PRODUCE AN ACCURATE PRINTED GRAPH IN A REASONABLY SHORT TIME FROM NUMERICAL DATA STORED ON MAGNETIC TAPE. THE 7074 PROGRAM CONSISTS OF A MAIN PROGRAM AND FIVE SUBROUTINES. THIS PROGRAM CONVERTS THE DATA UNDER A WIDE RANGE OF OPTIONS TO GRAPHICAL FORM, AND WRITES THE GRAPH AS RECORDS ON MAGNETIC TAPE. THE 1401 PROGRAM CONVERTS THE RECORDS ON THE TAPE TO A PRINTED GRAPH. TIMING-- 7074-- APPROXIMATELY 30 SECONDS FOR A LARGE GRAPH /600 POINTS/, 5 SECONDS FOR A SMALL GRAPH /60 POINTS/. 1401-- APPROXIMATELY 15 SECONDS FOR PRINTING EACH GRAPH.

7074-- THE PROGRAM HAS BEEN DESIGNED FOR A TAPE ORIENTED, TWO CHANNEL, 10K CORE IBM 7074. THREE TAPE UNITS ARE REQUIRED FOR BASIC PROCESSING, BUT SIX UNITS ARE NEEDED IF ALL PROGRAM OPTIONS ARE TO BE USED.

1401-- A TAPE 1401, EQUIPPED TO SUPPRESS THE PRINTER LINE ADVANCE ON COMMAND IS REQUIRED. A PRINT CHAIN EMPLOYING FIVE SPECIAL CHARACTERS IS NECESSARY FOR THE GRAPH PRINTING. A MAXIMUM OF 1500 POINTS AND FIVE CURVES MAY BE PLOTTED PER GRAPH. THE NUMBER OF GRAPHS TO BE PLOTTED IS NOT LIMITED AND PROVISION IS INCLUDED FOR FLIP-FLOP OF INPUT AND OUTPUT TAPES. TWO SEPARATE Y AXES ALLOW SIMULTANEOUS PLOTTING OF CURVES MEASURED BY DIFFERENT UNITS.

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7070-08.1.010 ARCTANGENT SUBROUTINE  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 7070-08.1.010

AUTHOR...M. ROBERTS  
AC SPARK PLUG DIV GMC  
MILWAUKEE, WISCONSIN

DIRECT INQUIRIES TO AUTHOR

TO FIND ARCTAN OF ARGUMENT X WHERE X EQUALS Y/X FLOATING HARDWARE, 77 WORDS STORAGE INPUT MUST BE IN NORMALIZED FLOATING POINT NOTATION. ANSWER MAY BE IN EITHER DEGREES OR RADIONS. SIGNS OF Y/X WILL DETERMINE THE QUADRANT OF THE ANSWER.

7070-08.2.003 SUBROUTINE EN FOR IBM 7070  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 7070-08.2.003

AUTHOR...ROLLS ROYCE LTD.  
P.O. BOX 31  
DERBY ENGLAND

DIRECT INQUIRIES TO AUTHOR

A SUBROUTINE TO COMPUTE THE NATURAL ANTILOGARITHM TO 10 DECIMAL PLACES. THE METHOD IS DESCRIBED IN THE IBM JOURNAL OF RESEARCH AND DEVELOPMENT, APRIL 1957. THE RESULT WILL BE ACCURATE TO 1 IN THE 10TH SIGNIFICANT FIGURE.

7070-08.3.003 NTH ROOT OF X  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 7070-08.3.003

AUTHOR...ROLLS ROYCE LTD.  
P.O. BOX 31  
DERBY ENGLAND

DIRECT INQUIRIES TO AUTHOR

A SUBROUTINE TO COMPUTE ANY INTEGRAL, FOUR DIGITS, ROOT OF A SINGLE PRECISION FIXED POINT ARGUMENT. NEWTONS ITERATION PROCESS IS USED. THE ARGUMENT MUST BE POSITIVE AND LESS THAN 1. THE MAXIMUM ERROR IS ABOUT 5 IN THE 10TH DECIMAL PLACE.

7070-08.3.011 POLYNOMIAL ROOT SUBROUTINE  
AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-08.3.011

AUTHOR...ROLLAND CULP  
AC SPARK PLUG DIVISION GMC  
MILWAUKEE, WISCONSIN

DIRECT INQUIRIES TO AUTHOR

TO FIND THE ROOTS OF ANY POLYNOMIAL WITH REAL COEFFICIENTS. FLOATING POINT HARDWARE, APPROXIMATELY 500 CORE LOCATIONS IN ADDITION TO ADDITIONAL SUBROUTINES REQUIRED. THE AC SPARK PLUG SUBROUTINES DOUBLE PRECISION FLOATING ADD, SQUARE ROOT, AND COMPLEX ARITHMETIC, GUIDE FILE NUMBERS 8.4.003, 8.3.006, MUST BE INCLUDED. EXITS ARE PROVIDED IF EITHER OR BOTH METHODS FAIL TO CONVERGE.

7070-08.4.001 DOUBLE PRECISION FLOATING  
DIVIDE  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 7070-08.4.001

AUTHORS..R. HAERTLE M. ROBERTS

DIRECT INQUIRIES TO..

R. HAERTLE  
AC SPARK PLUG DIV GMC  
MILWAUKEE, WISCONSIN

DIVIDE A 16 DIGIT FLOATING POINT NUMBER BY A 16 DIGIT FLOATING POINT NUMBER TO OBTAIN A 16 DIGIT FLOATING POINT QUOTIENT. FLOATING HARDWARE, 30 CORE STORAGE WORDS THE AC SPARK PLUG DOUBLE PRECISION FLOATING ADD AND MULTIPLY ROUTINES MUST BE ASSEMBLED WITH THIS ROUTINE.

7070-08.4.002 DOUBLE PRECISION FLOATING  
MULTIPLY  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 7070-08.4.002

AUTHORS..R. HAERTLE M. ROBERTS

DIRECT INQUIRIES TO..

R. HAERTLE  
AC SPARK PLUG DIV GMC  
MILWAUKEE, WISCONSIN

MULTIPLY TWO 16 DIGIT FLOATING POINT NUMBERS. FLOATING HARDWARE, 35 CORE STORAGE WORDS A 16 DIGIT PRODUCT IS DEVELOPED. THE AC SPARK PLUG DOUBLE PRECISION ADD SUBROUTINE MUST BE USED WITH THIS SUBROUTINE.

7070-08.4.003 DOUBLE PRECISION FLOATING  
ADD  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 7070-08.4.003

AUTHORS..R. HAERTLE M. ROBERTS

CONTINUED FROM PRIOR COLUMN--

DIRECT INQUIRIES TO..  
R. HAERTLE  
AC SPARK PLUG DIV GMC  
MILWAUKEE, WISCONSIN

ADD TWO 16 DIGIT FLOATING NUMBERS FLOATING HARDWARE, 22 CORE STORAGE WORDS INPUT MUST BE IN NORMALIZED FLOATING POINT FORM /THE LOW ORDER WORD OF THE DOUBLE PRECISION NUMBER MUST HAVE A CHARACTERISTIC OF EIGHT LESS THE HIGH ORDER WORD OF THAT DOUBLE PRECISION NUMBER/.

7070-08.4.004 DOUBLE PRECISION FLOATING  
DIVIDE SUBROUTINE  
AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-08.4.004

AUTHORS..G. D. MONROE R. A. HAERTLE M. A. ROBERTS

DIRECT INQUIRIES TO..  
G. D. MONROE  
AC SPARK PLUG DIV. GMC  
MILWAUKEE, WISCONSIN

TO DIVIDE TWO 16 DIGIT FLOATING DECIMAL NUMBERS /BASIC FORTRAN/. FLOATING HARDWARE, 38 CORE STORAGE WORDS IN ADDITION TO FLOATING ADD AND MULTIPLY SUBROUTINES. THE MODIFIED CHARACTERISTIC OF THE SECOND HALF OF A FLOATING POINT NUMBER MUST BE EIGHT LESS THAN THAT OF THE FIRST HALF. THE VARIABLES IN THE CALLING SEQUENCE MAY BE INDEXED.

7070-08.4.005 DOUBLE PRECISION FLOATING  
MULTIPLY SUBROUTINE  
AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-08.4.005

AUTHORS..G. D. MONROE R. A. HAERTLE M. A. ROBERTS

DIRECT INQUIRIES TO..  
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AC SPARK PLUG DIV. GMC  
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TO MULTIPLY TWO 16 DIGIT FLOATING DECIMAL NUMBERS /BASIC FORTRAN/. FLOATING HARDWARE, 58 CORE STORAGE WORDS IN ADDITION TO FLOATING ADD SUBROUTINE. THE MODIFIED CHARACTERISTIC OF THE SECOND HALF OF A FLOATING POINT NUMBER MUST BE EIGHT LESS THAN THAT OF THE FIRST HALF. THE VARIABLES IN THE CALLING SEQUENCE MAY BE INDEXED.

7070-08.4.006 DOUBLE PRECISION FLOATING  
SUBTRACT SUBROUTINE  
AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-08.4.006

AUTHORS..G. D. MONROE R. A. HAERTLE M. A. ROBERTS

DIRECT INQUIRIES TO..  
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AC SPARK PLUG DIV. GMC  
MILWAUKEE, WISCONSIN

TO SUBTRACT TWO 16 DIGIT FLOATING DECIMAL NUMBERS /BASIC FORTRAN/. 48 LOCATIONS OF CORE STORAGE, FLOATING POINT HARDWARE. THE MODIFIED CHARACTERISTIC OF THE SECOND HALF OF A FLOATING POINT NUMBER MUST BE EIGHT LESS THAN THAT OF THE FIRST HALF. THE VARIABLES IN THE CALLING SEQUENCE MAY BE INDEXED.

7070-08.4.007 DOUBLE PRECISION FLOATING  
ADD SUBROUTINE  
AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-08.4.007

AUTHORS..G. D. MONROE R. A. HAERTLE M. A. ROBERTS

DIRECT INQUIRIES TO..  
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AC SPARK PLUG DIVISION GMC  
MILWAUKEE, WISCONSIN

TO ADD TWO 16 DIGIT FLOATING DECIMAL NUMBERS /BASIC FORTRAN/. 48 CORE LOCATIONS, FLOATING HARDWARE. THE MODIFIED CHARACTERISTIC OF THE SECOND HALF OF A DOUBLE PRECISION NUMBER MUST BE EIGHT LESS THAN THAT OF THE FIRST HALF. THE VARIABLES IN THE CALLING SEQUENCE CAN BE INDEXED.

7070-09.1.001 7070 POLYNOMIAL ROOT  
EXTRACTION /TIREX/  
AVAILABLE 3RD QUARTER 1962.  
SPECIFY FILE NUMBER 7070-09.1.001

AUTHOR...GEORGE E. PRIEST  
TEXAS INSTRUMENTS  
TECHNICAL COMPUTATIONS  
P. G. BOX 5474  
DALLAS 22, TEXAS

DIRECT INQUIRIES TO AUTHOR

THIS ROUTINE IS DESIGNED TO SOLVE FOR ALL ZEROS /ROOTS/ OF A POLYNOMIAL IN ONE UNKNOWN WITH REAL COEFFICIENTS. AS THE SOURCE DECK STANDS IT CALLS FOR ONE CARD READER /ALPHA/ AND ONE MAGNETIC TAPE ON UNIT 14. THIS MAY BE EASILY ALTERED IN THE SOURCE PROGRAM. THE ROUTINE REQUIRES 399 STORAGE LOCATIONS WHEN ASSEMBLED PLUS PACKAGE DECK AND SQUARE ROOT SUBROUTINE. THE ROUTINE IS DESIGNED FOR POLYNOMIAL WITH ONLY REAL COEFFICIENTS, HOWEVER IT SOLVES FOR BOTH REAL AND COMPLEX ROOTS.

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7070-09.1.004 POLYNOMIAL EXPANSION  
AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-09.1.004

AUTHOR...JOHN P. CAMP  
AC SPARK PLUG DIV. GMC  
MILWAUKEE, WISCONSIN

DIRECT INQUIRIES TO AUTHOR

TO FORM THE COEFFICIENTS OF A REAL POLYNOMIAL FROM REAL AND/OR COMPLEX ROOTS. BASIC 7070 THE POLYNOMIAL FORMED MUST HAVE REAL COEFFICIENTS AND BE OF DEGREE NOT GREATER THAN 99. ANY NUMBER OF POLYNOMIALS CAN BE CALCULATED ON EACH RUN. THE ROUTINE IS WRITTEN IN BASIC FORTRAN AND WITH THE BASIC FORTRAN PACKAGE OCCUPIES ABOUT 2000 LOCATIONS.

7070-09.2.001 STEEPEST DESCENT SERIES  
/SDXX, SDXN, SDDE/  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 7070-09.2.001

AUTHOR...MR. DONALD I. RUBIN  
AMERICAN CYANAMID COMPANY  
SCIENTIFIC & TECHNICAL COMPUTING  
DATA PROCESSING DIVISION  
BERDAN AVENUE  
WAYNE, NEW JERSEY

DIRECT INQUIRIES TO AUTHOR

DETERMINES VARIABLE PARAMETERS THAT WILL MINIMIZE A GIVEN FUNCTION. IN /SDXX/ THE FUNCTION IS EXPLICIT AND THE PARTIAL DERIVATIVES OF THE FUNCTION /TO BE MINIMIZED/ WITH RESPECT TO THE VARIABLES IS EXPLICIT. IN /SDXN/ THE PARTIAL DERIVATIVE OF THE FUNCTION WITH RESPECT TO THE VARIABLES IS COMPUTED NUMERICALLY. IN /SDDE/ THE FUNCTION IS DEFINED BY A SET OF DIFFERENTIAL EQUATIONS. SOURCE LANGUAGE- FORTRAN II

FILE #10.9.001 /MBLA/ /GFPA/ FILE #11.3.011 /PEXX/ /PEXN/ /PEDE/  
CALL ON FILE #10.1.013 /MILE/ & FILE #10.1.014 /MATMU/.  
FILE #10.1.013 /MILE/ CALLS ON FILE #10.1.014 /MATMU/.  
FILE #09.2.001 /SDDE/ /SDXN/ FILE #11.3.011 /PEDE/ CALL ON  
FILE #09.3.004 /IRK/.

7070-09.2.002 7070/72 GAMMA FUNCTION  
SUBROUTINE  
AVAILABLE 3RD QUARTER 1965.  
SPECIFY FILE NUMBER 7070-09.2.002

AUTHOR...L.E. BUBB  
WASHINGTON UNIVERSITY  
COMPUTING FACILITIES  
SEVER 200  
ST. LOUIS, MO. 63130

DIRECT INQUIRIES TO AUTHOR

THIS FORTRAN PROGRAM COMPUTES THE VALUE OF X FACTORIAL FOR ALL VALUES OF X NOT EQUAL TO -1, -2, -3 ... AND BETWEEN 640 AND -40 WITH A MAXIMUM ERROR OF 2 IN THE EIGHTH DECIMAL PLACE USING SINGLE PRECISION FLOATING-POINT ARITHMETIC. THE SUBROUTINE REQUIRES 185 PLACES OF CORE. THE TIME REQUIRED IS 2/1000TH OF A SECOND FOR AN ALPHA OF APPROXIMATE MAGNITUDE 2 UP TO 8/100TH OF A SECOND FOR AN ALPHA OF APPROXIMATE MAGNITUDE 40. BASIC 7070 REQUIRED.

7070-09.3.001 RUNGE-KUTTA-GILL NUMERICAL  
SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS  
AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-09.3.001

AUTHOR...J. A. BEUTLER A. SHELDON

DIRECT INQUIRIES TO...

J. A. BEUTLER  
E. I. DU PONT DE NEMOURS AND CO.  
ENGR. DEPT., EXPERIMENTAL STATION  
WILMINGTON, DELAWARE

THIS SUBROUTINE IS USED FOR SOLVING, NUMERICALLY, N SIMULTANEOUS FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS. THIS SUBROUTINE REQUIRES 55 STORAGE LOCATIONS AND USES INDEX WORDS 90 THROUGH 96 AND 98. FLOATING DECIMAL HARDWARE IS REQUIRED. THERE ARE NO ERROR STOPS. THE NUMBER OF EQUATIONS, N, WHICH CAN BE SOLVED IS LIMITED ONLY BY AVAILABLE STORAGE.

7070-09.3.003 DIFFERENTIAL EQUATIONS  
/DFEQN/  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 7070-09.3.003

AUTHOR...DONALD I RUBIN  
AMERICAN CYANAMID COMPANY  
SCIENTIFIC & TECHNICAL COMPUTING  
DATA PROCESSING DIVISION  
BERDAN AVENUE  
WAYNE, NEW JERSEY

DIRECT INQUIRIES TO AUTHOR

METHOD FOR INTEGRATING A SYSTEM OF FIRST ORDER DIFFERENTIAL EQUATIONS BY WAY OF PREDICTOR-CORRECTOR TECHNIQUE WITH ERROR CONTROL AND MATCH POINT. SOURCE LANGUAGE- FORTRAN II

7070-09.3.004 DIFFERENTIAL EQUATIONS /IRK/  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 7070-09.3.004

AUTHOR...DONALD I RUBIN  
AMERICAN CYANAMID COMPANY  
SCIENTIFIC & TECHNICAL COMPUTING

CONTINUED FROM PRIOR COLUMN--  
DATA PROCESSING DIVISION  
BERDAN AVENUE  
WAYNE, NEW JERSEY

DIRECT INQUIRIES TO AUTHOR

/IRK/ IS A METHOD FOR INTEGRATING A SYSTEM OF FIRST ORDER DIFFERENTIAL EQUATIONS BY WAY OF RUNGE-KUTTA, WITH ERROR CONTROL AND MATCH POINT. SOURCE LANGUAGE- FORTRAN II.

FILE #10.9.001 /MBLA/ /GFPA/ FILE #11.3.011 /PEXX/ /PEXN/ /PEDE/  
CALL ON FILE #10.1.013 /MILE/ & FILE #10.1.014 /MATMU/. FILE #  
10.1.013 /MILE/ CALLS ON FILE #10.1.014 /MATMU/. FILE #09.2.001  
/SDDE/ /SDXN/ FILE #11.3.011 /PEDE/ CALL ON FILE #09.3.004 /IRK/.

7070-09.5.001 GAUSS NUMERICAL INTEGRATION  
SUBPROGRAM /IBM 704 FORTRAN/  
AVAILABLE 3RD QUARTER 1962.  
SPECIFY FILE NUMBER 7070-09.5.001

AUTHOR...R. M. DAVIS  
ENGINEERING PROGRAMMING GROUP  
HERCULES POWDER COMPANY  
BACCHUS WORKS  
MAGNA, UTAH

DIRECT INQUIRIES TO AUTHOR

A. PURPOSE THIS FUNCTION SUBPROGRAM WILL COMPUTE THE INTEGRAL OF A FUNCTION BETWEEN TWO LIMITS TO ANY SPECIFIED RELATIVE ACCURACY USING THE GAUSS' FORMULA OF NUMERICAL INTEGRATION.  
B. MACHINE REQUIREMENTS FLOATING POINT HARDWARE.  
C. GENERAL DESCRIPTION THIS SUBPROGRAM COMPUTES THE INTEGRAL OF A FUNCTION BY A GAUSS QUADRATURE. THE GAUSS METHOD REDUCES THE INTEGRAL TO LIMITS BETWEEN 0 AND 1 BY A TRANSFORMATION. THE FUNCTION IS THEN APPROXIMATED BY A HIGH-ORDER POLYNOMIAL. THE INTEGRAL IS THEN COMPUTED BETWEEN THE SPECIFIED LIMITS.  
D. CAPABILITIES AND LIMITATIONS THIS SUBPROGRAM WILL COMPUTE THE INTEGRAL WITHIN A DESIRED RELATIVE ACCURACY. THE PROGRAM IS WRITTEN SO THAT THE INTEGRAL CAN BE COMPUTED AS A SUMMATION OF SMALLER INTEGRALS /FOR EXAMPLE THE INTEGRALS BETWEEN THE POINTS OF INFLECTIONS MAY BE COMPUTED AND SUMMED/ THIS SUBPROGRAM DOES NOT CHECK FOR DISCONTINUITIES.

\*N

7070-09.5.002 NUMERICAL INTEGRATION AREA  
/F/  
AVAILABLE 1ST QUARTER 1963.  
SPECIFY FILE NUMBER 7070-09.5.002

AUTHOR...LEE OHRINGER  
UNIVERSITY OF PITTSBURGH  
COMPUTATION AND D.P. CENTER  
PITTSBURGH 13, PA.

DIRECT INQUIRIES TO AUTHOR

COMPUTE THE AREA UNDER A SET OF POINTS WHOSE X COORDINATES ARE EQUALLY SPACED. ACCUMULATORS 1, 2, AND 3. INDEX WORDS 92, 93, AND 94. 289 CORE STORAGE LOCATIONS.

7070-09.9.001 DOUBLE PRECISION LEAST  
SQUARES  
AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-09.9.001

AUTHOR...HUGH B. JONES  
AC SPARK PLUG DIV. GMC  
MILWAUKEE, WISCONSIN

DIRECT INQUIRIES TO AUTHOR

TO FIT A FUNCTION OF THE TYPE Y MINUS K1F1 PLUS K2F2 PLUS ... KNFN TO A SET OF DISCRETE DATA USING DOUBLE PRECISION ARITHMETIC TO RECOVER THE K1 S IN ACCORDANCE WITH THE PRINCIPLE OF LEAST SQUARES WHERE THE FUNCTION Y IS LINEAR IN ITS CONSTANTS K1, AND THE VARIABLES F1 ARE ANY FUNCTIONS OF THE INDEPENDENT VARIABLES FOR WHICH THE USER CAN SUPPLY THE VALUES. FLOATING HARDWARE, 155 CORE STORAGE WORDS PLUS DATA AREAS AND ADDITIONAL SUBROUTINES /SEE D. BELOW/. THE AC SPARK PLUG SUBROUTINES DOUBLE PRECISION FLOATING ADD, FLOATING MULTIPLY, FLOATING DIVIDE, AND SIMULTANEOUS LINEAR EQUATION SOLUTION AND/OR MATRIX INVERSION. GUIDE FILE NUMBERS 8.4.003, 8.4.002, 8.4.001 MUST BE INCLUDED. EXITS ARE PROVIDED FOR THE USER TO SUPPLY INPUT DATA AND DO EXTRA CODING. IN ADDITION TO THE K1 S, THE SUBROUTINE RETURNS THE DETERMINANT OF THE COEFFICIENT MATRIX AND, IF THE USER SO SPECIFIES, THE INVERSE OF THE COEFFICIENT MATRIX. ALL INPUT MUST BE IN NORMALIZED DOUBLE PRECISION FLOATING POINT FORM. AN ERROR RETURN IS PROVIDED IN CASE THE SYSTEM IS FOUND TO BE LINEARLY DEPENDENT.

7070-09.9.002 SOLUTION OF NON-LINEAR  
EQUATION IN ONE VARIABLE /ROOT/  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 7070-09.9.002

AUTHOR...DONALD I RUBIN  
AMERICAN CYANAMID COMPANY  
SCIENTIFIC & TECHNICAL COMPUTING  
DATA PROCESSING DIVISION  
BERDAN AVENUE  
WAYNE, NEW JERSEY

DIRECT INQUIRIES TO AUTHOR

THIRD ORDER METHOD FOR FINDING THE ROOT OF A NON-LINEAR EQUATION IN ONE UNKNOWN. LANGUAGE- FORTRAN.

7070-10.1.005 MATRIX INVERSION AND  
SOLUTION OF SIMULTANEOUS EQUATIONS  
AVAILABLE 2ND QUARTER 1962.

# Contributed Programs

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CONTINUED FROM PRIOR PAGE--  
SPECIFY FILE NUMBER 7070-10.1.005

AUTHORS...J. A. BEUTLER A. SHELDON

DIRECT INQUIRIES TO...  
J. A. BEUTLER

E. I. DU PONT DE NEMOURS AND CO.  
ENGR. DEPT., EXPERIMENTAL STATION  
WILMINGTON, DELAWARE

THE MAIN USE OF THIS ROUTINE WILL BE IN INVERTING MATRICES OR SOLVING SYSTEMS OF SIMULTANEOUS EQUATIONS INCIDENTAL TO THE SOLUTION OF A LONGER PROBLEM. THIS PROGRAM REQUIRES 72 STORAGE LOCATIONS AND USES INDEX WORDS 90 THROUGH 99. FLOATING DECIMAL HARDWARE IS REQUIRED. 1. THE FIRST ELEMENT OF THE MATRIX CANNOT BE ZERO. 2. THE SYSTEM WILL FAIL IF A11 = A22 EQUALS A12 = A21. 3. THERE ARE NO ERROR STOPS.

7070-10.1.010 MATRIX INVERSION SUBROUTINE  
/IBM 7074 FORTRAN/  
AVAILABLE 3RD QUARTER 1962.  
SPECIFY FILE NUMBER 7070-10.1.010

AUTHOR...R. M. DAVIS  
ENGINEERING PROGRAMMING GROUP  
HERCULES POWDER COMPANY  
BACCHUS WORKS  
MAGNA, UTAH

DIRECT INQUIRIES TO AUTHOR

A. PURPOSE THIS SUBROUTINE COMPUTES THE INVERSE OF A MATRIX. THIS SUBROUTINE REQUIRES THE /SIMULTANEOUS EQUATION SOLVER SUBROUTINE/ (FILE NO. 10-4-006) ALSO CONTRIBUTED BY HERCULES POWDER COMPANY. THIS SUBROUTINE SOLVES FOR A UNIT MATRIX TO INVERT THE ORIGINAL.  
B. MACHINE REQUIREMENTS FLOATING POINT HARDWARE  
C. GENERAL DESCRIPTION THIS SUBROUTINE COMPUTES THE INVERSE BY USING THE GAUSS REDUCTION METHOD. THIS ROUTINE BUILDS A UNIT MATRIX AND CALLS THE PREVIOUSLY MENTIONED SUBROUTINE TO SOLVE THIS SYSTEM. A PIVOT SEARCH IS USED TO GAIN ACCURACY AND TO PREVENT A DIVISION BY ZERO. IF ALL OF A COLUMN IS ZERO, AN ERROR MESSAGE IS TYPED ON THE CONSOLE.  
D. CAPABILITIES AND LIMITATIONS THIS SUBROUTINE IS DIMENSIONED BY /I/ /VARIABLE DIMENSIONED/. EQUATIONS OF THE FORM SUBSCRIPT EQUALS ROW PLUS /NUMBER OF ROWS/ /COLUMN - 1/ ARE USED TO DIRECT THE SUBROUTINE TO USE THE CORRECT ELEMENTS OF THE ARRAY IN AN OPERATION. RESTRICTIONS ON THE ORDER OF THE MATRIX DEPENDS UPON CORE STORAGE.

7070-10.1.006 SOLUTION OF SIMULTANEOUS  
LINEAR EQUATIONS AND/OR MATRIX INVERSION IN DOUBLE PRECISION /SUB/  
AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-10.1.006

AUTHOR...BARBARA A. MANTEY  
AC SPARK PLUG DIV. GMC  
MILWAUKEE, WISCONSIN

DIRECT INQUIRIES TO AUTHOR

SEE TITLE. ALSO CALCULATE DETERMINANT OF INPUT MATRIX. FLOATING POINT HARDWARE, APPROXIMATELY 400 WORDS OF CORE STORAGE PLUS DATA AREAS. INPUT IN DOUBLE PRECISION NORMALIZED FLOATING POINT FORM /THE SECOND HALF OF EACH DATA NUMBER MAY BE ZERO/. THE AC SPARK PLUG DOUBLE PRECISION FLOATING ADD, MULTIPLY, AND DIVIDE SUBROUTINES, GUIDE FILE NUMBERS 8.4.003, 8.4.002, 8.4.001. AN ERROR RETURN IS PROVIDED IN CASE LINEAR DEPENDENCE IS DETECTED. THE INPUT MATRIX IS DESTROYED.

7070-10.1.011 MATRIX MULTIPLICATION  
SUBROUTINE /IBM 7074 FORTRAN/  
AVAILABLE 3RD QUARTER 1962.  
SPECIFY FILE NUMBER 7070-10.1.011

AUTHOR...R. M. DAVIS  
ENGINEERING PROGRAMMING GROUP  
HERCULES POWDER COMPANY  
BACCHUS WORKS  
MAGNA, UTAH

DIRECT INQUIRIES TO AUTHOR

A. PURPOSE THIS SUBROUTINE MULTIPLIES A MATRIX A/M,N/ BY A MATRIX B/N,K/ TO GIVE A MATRIX C/M,K/. THIS PROGRAM IS VARIABLE DIMENSIONED TO WORK WITH ANY DIMENSIONED ARRAYS. DOTTED AREAS OF MATRIX A AND B INDICATE THE VERSATILITY OF THIS PROGRAM TO BE ABLE TO CONFORMABLY PARTITION LARGER MATRICES AND PERFORM MULTIPLICATION OF SELECTED ELEMENTS.  
B. MACHINE REQUIREMENTS FLOATING POINT HARDWARE.  
C. GENERAL DESCRIPTION MATRIX MULTIPLICATION /MXMULT/ IS PERFORMED IN THE USUAL WAY. IN ORDER TO PERFORM MATRIX MULTIPLICATION, TWO MATRICES MUST BE CONFORMABLE IN ORDER.  
D. CAPABILITIES AND LIMITATIONS THIS SUBROUTINE IS DIMENSIONED BY /I/ /VARIABLE DIMENSIONED/. EQUATIONS OF THE FORM SUBSCRIPT EQUALS ROW PLUS /NUMBER OF ROWS/ /COLUMN - 1/ ARE USED TO DIRECT THE SUBROUTINE TO USE THE CORRECT ELEMENTS OF THE ARRAY IN AN OPERATION. RESTRICTIONS ON THE ORDER OF THE MATRIX DEPENDS UPON CORE STORAGE.

7070-10.1.007 DOUBLE PRECISION MATRIX  
INVERSION  
AVAILABLE 3RD QUARTER 1962.  
SPECIFY FILE NUMBER 7070-10.1.007

AUTHOR...D. SHOLTZ  
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DIRECT INQUIRIES TO AUTHOR

A. PURPOSE TO INVERT AN NXN MATRIX USING DOUBLE PRECISION FLOATING POINT ARITHMETIC AND LEAVE THE INVERTED MATRIX IN THE STORAGE PREVIOUSLY OCCUPIED BY THE ORIGINAL MATRIX.  
B. MACHINE REQUIREMENTS FLOATING POINT HARDWARE.  
C. GENERAL DESCRIPTION THE METHOD USED IS SIMPLE ELIMINATION. THE SPEED VARIES WITH THE SIZE OF THE MATRIX AND THE PARTICULAR NUMBERS INVOLVED A 10X10 MATRIX TAKES ABOUT 9 SECONDS, A 30X30 ABOUT 5 MINUTES, AND A 65X65 OVER 30 MINUTES. THE ERROR ALSO IS VARIABLE, DEPENDING AGAIN UPON THE SIZE OF THE MATRIX AND THE PARTICULAR NUMBERS INVOLVED MAXIMUM ERROR FOR A 10X10 HILBERT MATRIX IS 6 IN THE SIXTH PLACE.  
D. CAPABILITIES AND LIMITATIONS INPUT MUST BE IN FLOATING POINT FORM, THE HIGH ORDER WORD OF EACH ELEMENT BEING NORMALIZED AND THE CHARACTERISTIC OF THE LOW ORDER WORD BEING 8 LESS THAN THE HIGH ORDER WORD BOTH WORDS MUST BE OF THE SAME SIGN. THE SUBROUTINE REQUIRES ABOUT 300 LOCATIONS AND ALTERS THE ACCUMULATORS, INDICATORS AND INDEX WORDS 90-98. THE U. OF PITTSBURGH DOUBLE PRECISION ADDITION, MULTIPLICATION, AND DIVISION SUBROUTINES ARE USED AND INCLUDED IN THE SUBROUTINE. THE SIZE OF THE MATRIX IS LIMITED BY STORAGE, THE MAXIMUM, FOR A 10K MACHINE, BEING 65X65.

7070-10.1.012 ORTHOGONAL FACTOR SIMILARITY  
PROGRAM  
AVAILABLE 2ND QUARTER 1963.  
SPECIFY FILE NUMBER 7070-10.1.012

AUTHOR...A.W. BENDIG  
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DIRECT INQUIRIES TO AUTHOR

COMPARES TWO MATRICES OF ORTHOGONAL FACTOR LOADINGS AND COMPUTES /1/ TRANSFORMATION MATRICES FOR ROTATING EACH MATRIX TO MAXIMUM SIMILARITY WITH THE OTHER MATRIX, AND /2/ MATRICES GIVING THE LOADINGS OF EACH FACTOR IN ONE MATRIX ON THE FACTORS IN THE SECOND MATRIX. 7070 WITH 10K CORE STORAGE, FLOATING-POINT HARDWARE, I/O TAPE UNITS OR ON-LINE CARD READER AND PRINTER. DOUBLE PRECISION ARITHMETIC USED THROUGHOUT. PROGRAMMED IN AUTOCODER.

7070-10.1.008 MATRIX TRANSPOSITION  
SUBROUTINE - FLIP /IBM 7074 FORTRAN/  
AVAILABLE 3RD QUARTER 1962.  
SPECIFY FILE NUMBER 7070-10.1.008

AUTHOR...R. W. STEELEY  
ENGINEERING PROGRAMMING GROUP  
HERCULES POWDER COMPANY  
BACCHUS WORKS  
MAGNA, UTAH

DIRECT INQUIRIES TO AUTHOR

A. PURPOSE TO TRANSPOSE A MATRIX WITHIN ITSELF.  
B. MACHINE REQUIREMENTS SUBROUTINE /FLIP/ IS WRITTEN FOR THE BASIC IBM 7070 WITH FLOATING POINT CAPABILITIES.  
C. GENERAL DESCRIPTION THIS SUBROUTINE IS VARIABLE DIMENSIONED IN ORDER TO MINIMIZE CORE STORAGE REQUIREMENTS. SIXTY-EIGHT MEMORY CELLS ARE NEEDED FOR THIS ROUTINE.

7070-10.1.013 MATRIX INVERSION AND LINEAR  
EQUATIONS /MILE/  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 7070-10.1.013

AUTHOR...DONALD I RUBIN  
AMERICAN CYANAMID COMPANY  
SCIENTIFIC & TECHNICAL COMPUTING  
DATA PROCESSING DIVISION  
BERDAN AVENUE  
WAYNE, NEW JERSEY

DIRECT INQUIRIES TO AUTHOR

THE MATRICES CAN BE DEFINED AS BEING IMBEDDED IN LARGER MATRICES. IT CALCULATES WITH ERROR CONTROL. SOURCE LANGUAGE-FORTRAN II.

FILE #10.9.001 /MBLA/ /GFPA/ FILE #11.3.011 /PEXX/ /PEXN/ /PEDE/  
CALL ON FILE #10.1.013 /MILE/ & FILE #10.1.014 /MATMU/. FILE  
#10.1.013 /MILE/ CALLS ON FILE #10.1.014 /MATMU/. FILE #09.2.001  
/SDDE/ /SDXN/ FILE #11.3.011 /PEDE/ CALL ON FILE #09.3.004 /IRK/.

7070-10.1.009 COMPLEX MATRIX INVERSION  
SUBROUTINE /IBM 7074 FORTRAN/  
AVAILABLE 3RD QUARTER 1962.  
SPECIFY FILE NUMBER 7070-10.1.009

AUTHOR...C. D. TANNER  
ENGINEERING PROGRAMMING GROUP  
HERCULES POWDER COMPANY  
BACCHUS WORKS  
MAGNA, UTAH

DIRECT INQUIRIES TO AUTHOR

A. PURPOSE THIS PROGRAM FINDS THE INVERSE OF A COMPLEX MATRIX BY USING SUBROUTINE PLXNM /COMPLEX SIMULTANEOUS EQUATIONS SOLVER FILE NO 10-1.008/ AND SOLVING AGAINST A UNIT MATRIX. THE METHOD OF CROUT IS USED.  
B. MACHINE REQUIREMENTS FLOATING POINT HARDWARE.  
C. CAPABILITIES AND LIMITATIONS 1. THE SOURCE LANGUAGE IS FORTRAN. 2. ACCURACY IS SINGLE PRECISION FLOATING POINT.

7070-10.1.014 MATRIX MULTIPLICATION  
/MATMU/  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 7070-10.1.014

AUTHOR...DONALD I RUBIN  
AMERICAN CYANAMID COMPANY

# Contributed Programs

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CONTINUED FROM PRIOR PAGE--  
SCIENTIFIC & TECHNICAL COMPUTING  
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DIRECT INQUIRIES TO AUTHOR

THE MATRICES CAN BE DEFINED AS BEING IMBEDDED IN LARGER  
MATRICES. SOURCE LANGUAGE- FORTRAN II.

FILE #10.9.001 /MBLA/ /GFPA/ FILE #11.3.011 /PEXX/ /PEXN/ /PEDE/  
CALL ON FILE #10.1.013 /MILE & FILE #10.1.014 /MATMU/.  
FILE #10.1.013 /MILE/ CALLS ON FILE #10.1.014 /MATMU/. FILE  
.09.2.001 /SDDE/ /SDXN/ FILE #11.3.011 /PEDE/ CALL ON  
FILE #09.3.004 /IRK/.

7070-10.1.015 PRINCIPAL COMPONENTS FACTOR  
ANALYSIS

AVAILABLE 4TH QUARTER 1963.  
SPECIFY FILE NUMBER 7070-10.1.015

AUTHOR...A.W. BENDIG  
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DIRECT INQUIRIES TO AUTHOR

COMPUTES THE LARGEST LATENT ROOT AND ASSOCIATED VECTOR OF THE  
MATRIX USING AN ITERATION PROCEDURE DEVELOPED BY PAUL HORST,  
REDUCES THE RANK OF THE MATRIX BY ONE, COMPUTES THE SECOND  
LARGEST ROOT AND VECTOR, ETC. PROCESS CONTINUES UNTIL A FIXED  
NUMBER OF ROOTS AND VECTORS ARE COMPUTED OR UNTIL THE MAGNITUDE  
OF A ROOT IS LESS THAN ONE. MATRIX DIAGONAL ELEMENTS MAY BE READ  
IN OR THE PROGRAM WILL INSERT UNITIES INTO THE DIAGONALS. LATENT  
ROOTS AND VECTOR LOADINGS /LATENT VECTORS MULTIPLIED  
BY THE SQUARE ROOT OF THE ASSOCIATED LATENT ROOTS/ ARE PRINTED  
OUT TO THREE DECIMAL PLACES AND THE LOADINGS ARE ALSO PUNCHED OUT  
ON CARDS. ALL COMPUTATIONS ARE IN FIXED-POINT ARITHMETIC.  
MACHINE REQUIREMENTS- 10K CORE STORAGE, THREE TAPE UNITS.  
SYMBOLIC DECK OPTIONAL. IT WILL BE FORWARDED ONLY WHEN  
SPECIFICALLY REQUESTED.

7070-10.2.001 EIGENVALUE AND EIGENVECTOR  
ROUTINE

AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-10.2.001

AUTHOR...R. A. HAERTLE  
AC SPARK PLUG DIV. GMC  
MILWAUKEE, WISCONSIN

DIRECT INQUIRIES TO AUTHOR

A PROGRAM TO FIND THE EIGENVALUES AND EIGENVECTORS OF REAL  
SYMMETRIC MATRIX. 10K STORAGE, FLOATING HARDWARE, TWO TAPE  
CHANNELS. BY A PROGRAM CHANGES TO THE FORTRAN SOURCE DECK, THE  
PROGRAM CAN BE ADAPTED TO ANY 7070 CONFIGURATION. FOR A 5K  
MACHINE, THE MAXIMUM N WOULD BE 39 IF FLOATING POINT  
HARDWARE IS INSTALLED AND SOMEWHAT LESS IF FLOATING POINT  
ARITHMETIC IS SIMULATED.

7070-10.2.002 EIGENVALUE AND EIGENVECTOR  
SOLVER SUBROUTINE /IBM 7074 FORTRAN/

AVAILABLE 3RD QUARTER 1962.  
SPECIFY FILE NUMBER 7070-10.2.002

AUTHOR...R. M. DAVIS  
ENGINEERING PROGRAMMING GROUP  
HERCULES POWDER COMPANY  
BACCHUS WORKS  
MAGNA, UTAH

DIRECT INQUIRIES TO AUTHOR

A. PURPOSE THIS SUBROUTINE COMPUTES THE EIGENVALUES AND  
EIGENVECTORS OF A SYMMETRIC MATRIX USING THE JACOBIAN  
METHOD. THIS PROGRAM IS VARIABLE DIMENSIONED TO WORK WITH  
ANY DIMENSIONED ARRAYS.  
B. MACHINE REQUIREMENTS FLOATING POINT HARDWARE.  
C. GENERAL DESCRIPTION THE INPUT MATRIX MUST BE SYMMETRIC  
AND THE EIGENVALUES WILL BE COMPUTED AND STORED ON THE  
DIAGONAL OF THE MATRIX. THE MAIN PROGRAM WILL SPECIFY THE  
MAXIMUM NUMBER OF TRANSFORMATIONS TO BE EXECUTED. THIS IS  
TO PREVENT A CONTINUATION OF A MALFUNCTION THAT WILL NOT  
LET THE SYSTEM CONVERGE. THE NUMBER OF TRANSFORMATIONS  
USED IN THE SUBROUTINE WILL BE AVAILABLE TO THE CALLING  
PROGRAM. AN ADDITIONAL MATRIX MUST BE AVAILABLE TO STORE  
THE EIGENVALUES.  
D. CAPABILITIES AND LIMITATIONS THIS SUBROUTINE IS  
DIMENSIONED BY /I/ /VARIABLE DIMENSIONED/. EQUATIONS OF  
THE FORM SUBSCRIPT EQUALS ROW PLUS /NUMBER OF ROWS/  
/COLUMN - 1/ ARE USED TO DIRECT THE SUBROUTINE TO USE THE  
CORRECT ELEMENTS OF THE ARRAY IN AN OPERATION.  
RESTRICTIONS ON THE ORDER OF THE MATRIX DEPENDS UPON CORE  
STORAGE.

7070-10.3.001 DETERMINANT SOLVER  
SUBROUTINE /IBM 7074 FORTRAN/

AVAILABLE 3RD QUARTER 1962.  
SPECIFY FILE NUMBER 7070-10.3.001

AUTHOR...R. M. DAVIS  
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HERCULES POWDER COMPANY  
BACCHUS WORKS  
MAGNA, UTAH

DIRECT INQUIRIES TO AUTHOR

A. PURPOSE THIS SUBROUTINE COMPUTES THE DETERMINANT OF A  
MATRIX. THIS PROGRAM IS VARIABLE DIMENSIONED TO WORK WITH  
ANY DIMENSIONED MATRIX.  
B. MACHINE REQUIREMENTS FLOATING POINT HARDWARE.  
C. GENERAL DESCRIPTION THE DETERMINANT IS COMPUTED BY USING  
THE GAUSS REDUCTION. A PIVOT SEARCH IS PERFORMED TO GAIN

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CONTINUED FROM PRIOR COLUMN--  
ACCURACY AND TO PREVENT A DIVISION BY ZERO. IF ALL OF A  
COLUMN IS ZERO, AN ERROR MESSAGE IS WRITTEN ON TAPE 11  
/FEATURE CODE 12/ AND A MACHINE DUMP IS GIVEN.  
D. CAPABILITIES AND LIMITATIONS THIS SUBROUTINE IS  
DIMENSIONED BY /I/ /VARIABLE DIMENSIONED/. EQUATIONS OF  
THE FORM SUBSCRIPT EQUALS ROW PLUS /NUMBER OF ROWS/  
/COLUMN - 1/ ARE USED TO DIRECT THE SUBROUTINE TO USE  
THE CORRECT ELEMENTS OF THE ARRAY IN AN OPERATION.  
RESTRICTIONS ON THE ORDER OF THE DETERMINANT DEPENDS UPON  
CORE STORAGE.

7070-10.3.002 COMPLEX DETERMINANT SOLVER  
SUBROUTINE /IBM 7074 FORTRAN/

AVAILABLE 3RD QUARTER 1962.  
SPECIFY FILE NUMBER 7070-10.3.002

AUTHOR...R. M. DAVIS  
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HERCULES POWDER COMPANY  
BACCHUS WORKS  
MAGNA, UTAH

DIRECT INQUIRIES TO AUTHOR

A. PURPOSE THIS SUBROUTINE CALCULATES THE DETERMINANT OF A  
MATRIX WITH COMPLEX ELEMENTS. THE REAL AND IMAGINARY PARTS  
ARE SEPARATED INTO TWO MATRICES. THIS PROGRAM IS  
DIMENSIONED 50 X 50 TO WORK WITH MATRICES UP TO THIS ORDER.  
B. MACHINE REQUIREMENTS FLOATING POINT HARDWARE.  
C. GENERAL DESCRIPTION THE DETERMINANT IS COMPUTED BY USING  
THE METHOD OF CROUT. A PIVOT SEARCH IS PERFORMED TO GAIN  
ACCURACY AND TO PREVENT A DIVISION BY ZERO. SEE F. B.  
HILDEBRAND, INTRODUCTION TO NUMERICAL ANALYSIS, MC GRAWHILL  
1956, PP. 429-439.  
D. CAPABILITIES AND LIMITATIONS AT THE RETURN TO THE  
CALLING PROGRAM THE ORIGINAL MATRICES ARE DESTROYED. THIS  
PROGRAM CAN BE RECOMPILED WITH ANOTHER DIMENSION STATEMENT  
TO WORK WITH LARGER MATRICES OR TO SAVE MEMORY LOCATIONS.

7070-10.4.001 SOLUTION OF SIMULTANEOUS  
LINEAR EQUATIONS

AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 7070-10.4.001

AUTHOR...M. ROBERTS  
AC SPARK PLUG DIV. GMC  
MILWAUKEE WISCONSIN

DIRECT INQUIRIES TO AUTHOR

A PROGRAM TO SOLVE A SET OF SIMULTANEOUS LINEAR EQUATIONS  
BY CROUT REDUCTION. INPUT MUST BE IN NORMALIZED FLOATING  
POINT FORM.

7070-10.4.004 SLEP, SOLVE SIMULTANEOUS  
LINEAR EQUATIONS WITH PIVOTING FOR MACHINES W/O FLT. POINT HARDWARE

AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-10.4.004

AUTHOR...ROBERT H. JUDDSON  
THE B. F. GOODRICH COMPANY  
AKRON 18, OHIO

DIRECT INQUIRIES TO AUTHOR

SOLVE N SIMULTANEOUS LINEAR EQUATIONS WITH ONE RIGHT HAND  
COLUMN VECTOR /ONE SET OF CONSTANT TERMS/. INCLUDES  
PIVOTING SO THAT EQUATIONS MAY BE ARRANGED IN ANY ORDER AND  
MAY HAVE ZEROS ON DIAGONAL. SOLVE PROGRAM OCCUPIES 136  
WORDS AND 12 INDEX REGISTERS. FLOATING POINT ROUTINES USE  
150 WORDS WHICH CAN BE CUT DOWN OR STANDARD ROUTINES USED.  
LOCATION PV MUST NOT BE DISTURBED.

7070-10.4.005 COMPLEX SIMULTANEOUS  
EQUATION SOLVER /IBM 7074 FORTRAN/

AVAILABLE 3RD QUARTER 1962.  
SPECIFY FILE NUMBER 7070-10.4.005

AUTHOR...C.D. TANNER  
ENGINEERING PROGRAMMING GROUP  
HERCULES POWDER COMPANY  
BACCHUS WORKS  
MAGNA, UTAH

DIRECT INQUIRIES TO AUTHOR

A. PURPOSE THIS PROGRAM SOLVES THE COMPLEX SIMULTANEOUS  
EQUATION PROBLEM BY USING THE METHOD OF CROUT AND  
PERFORMING A PIVOT SEARCH DURING REDUCTION TO IMPROVE  
ACCURACY. IN ADDITION, PROGRAMMING HAS PROVIDED ADDITIONAL  
COLUMNS FOR CONSTANTS AGAINST WHICH THE ORIGINAL EQUATIONS  
MAY BE SOLVED. THIS PROGRAM IS VARIABLE DIMENSIONED TO  
ALLOW FOR THE SOLUTION OF ANY NUMBER OF COMPLEX  
SIMULTANEOUS EQUATIONS. B. MACHINE REQUIREMENTS FLOATING  
POINT HARDWARE. C. CAPABILITIES AND LIMITATIONS 1. THE  
SOURCE LANGUAGE IS FORTRAN. 2. TIMING IS M3/200- WHERE M  
IS THE NUMBER OF EQUATIONS. 3. ACCURACY IS SINGLE  
PRECISION FLOATING POINT. 4. THE DIMENSIONED MATRIX OF  
WHICH A AND B ARE SUBMATRICES MUST BE DIMENSIONED IN THE  
MAIN PROGRAM WITH M PLUS KC COLUMNS TO ALLOW THE KC  
COLUMNS OF CONSTANTS TO AUGMENT MATRICES A AND B.

7070-10.4.006 SIMULTANEOUS EQUATION SOLVER  
SUBROUTINE /IBM 7074 FORTRAN/

AVAILABLE 1ST QUARTER 1963.  
SPECIFY FILE NUMBER 7070-10.4.006

AUTHOR...MR. R.M. DAVIS  
ENGINEERING PROGRAMMING GROUP  
HERCULES POWDER COMPANY  
BACCHUS WORKS  
MAGNA, UTAH

# Contributed Programs

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CONTINUED FROM PRIOR PAGE--

DIRECT INQUIRIES TO AUTHOR

THIS SUBROUTINE COMPUTES THE SOLUTIONS OF N EQUATIONS AND N VARIABLES. IT WILL SOLVE FOR M COLUMNS OF CONSTANTS TO GIVE M SETS OF SOLUTIONS DURING ONE MACHINE COMPUTATION. GAUSS REDUCTION METHOD IS USED. CORE STORAGE IS THE ONLY RESTRICTION, SINCE VARIABLE DIMENSIONING IS USED.

7070-10.4.007 SOLUTION OF SYSTEMS OF LINEAR SIMULTANEOUS EQUATIONS BY CROUT REDUCTION  
AVAILABLE 1ST QUARTER 1963.  
SPECIFY FILE NUMBER 7070-10.4.007

AUTHOR...ROY CARLSON  
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62 MARKET STREET  
SAN FRANCISCO, CALIF.

DIRECT INQUIRIES TO AUTHOR

THE PROGRAM SOLVES SYSTEMS OF LINEAR SIMULTANEOUS EQUATIONS BY THE CROUT REDUCTION METHOD. THE CONTROL CARD /TO BE DESCRIBED LATER/ DETERMINES THE NUMBER OF SYSTEMS WHICH WILL BE SOLVED IN ONE CALCULATION RUN.

THE PROGRAM IS WRITTEN IN FORTRAN FOR AN IBM 7074 ASSUMING 10,000 WORDS OF STORAGE AND 3 TAPE DRIVES. THE PROGRAM MAY BE MODIFIED TO ALLOW A 7500 CARD READER TO BE USED IN LIEU OF TWO TAPE DRIVES, AND A 7400 PRINTER IN PLACE OF THE THIRD. TWO TAPE CHANNELS ARE USED.

7070-10.9.001 SOLUTION OF SYSTEM OF NON-LINEAR EQUATIONS /GFPA, MBLA/  
AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 7070-10.9.001

AUTHOR...DONALD I RUBIN  
AMERICAN CYANAMID COMPANY  
SCIENTIFIC & TECHNICAL COMPUTING  
DATA PROCESSING DIVISION  
BERDAN AVENUE  
WAYNE, NEW JERSEY

DIRECT INQUIRIES TO AUTHOR

/GFPA/ IS A METHOD OF SOLUTION OF SYSTEM OF NON-LINEAR EQUATIONS BY GENERALIZED FALSE POSITION. /MBLA/ IS A VERSION OF /GFPA/ PERFORMING HEAT AND MATERIAL BALANCE CALCULATIONS FOR CHEMICAL SYSTEMS. SOURCE LANGUAGE- FORTRAN II.

FILE #10.9.001 /MBLA/ /GFPA/ FILE #11.3.011 /PEXX/ /PEXN/ /PEDE/  
CALL ON FILE# 10.1.013 /MILE/ & FILE #10.1.014 /MATMU/. FILE  
# 10.1.013 /MILE/ CALLS ON FILE# 10.1.014 /MATMU/. FILE#  
09.2.001 /SDDE/ /SDXN/ FILE #11.3.011 /PEDE/ CALL ON FILE  
#09.3.004 /IRK/.

7070-11.2.001 AUTO-COVARIANCE, POWER SPECTRUM  
AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-11.2.001

AUTHOR...TERRY P. KINNEY  
AC SPARK PLUG DIV. GMC  
MILWAUKEE, WISCONSIN

DIRECT INQUIRIES TO AUTHOR

A PRE-ASSEMBLED PROGRAM TO CALCULATE THE AUTO COVARIANCE COEFFICIENTS OF A SET OF DATA POINTS TAKEN AT EQUAL INTERVALS. OPTIONS ARE PROVIDED TO TAKE FIRST DIFFERENCES, REMOVE THE MEAN, REMOVE A LEAST SQUARES REGRESSION LINE, AND TO CALCULATE THE POWER SPECTRUM DENSITY COEFFICIENTS. A METHOD TO SCALE THE DATA IS ALSO PROVIDED. FLOATING POINT HARDWARE, TWO TAPE CHANNELS WITH TWO TAPE UNITS ON CHANNEL 1 AND THREE TAPE UNITS ON CHANNEL 2, 10K STORAGE. THE METHOD USED IS TUKEY'S METHOD AS PRESENTED IN THE /THE SAMPLING THEORY OF POWER SPECTRUM ESTIMATES/, SYMPOSIUM ON APPLICATION OF AUTO-CORRELATION ANALYSIS TO PHYSICAL PROBLEMS, NAVEXOS P-735, OFFICE OF NAVAL RESEARCH, DEPT. OF THE NAVY, WASHINGTON D. C., 1949.

7070-11.2.002 AUTO-CORRELATION AND CROSS-CORRELATION PROGRAM  
AVAILABLE 2ND QUARTER 1963.  
SPECIFY FILE NUMBER 7070-11.2.002

AUTHOR...A. W. BENDIG  
COMPUTATION & DATA PROCESSING CTR.  
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PITTSBURGH 13, PENNSYLVANIA

DIRECT INQUIRIES TO AUTHOR

COMPUTES AUTOCORRELATION COEFFICIENTS FOR A SINGLE SERIES OF TIME-ORDERED MEASUREMENTS OR CROSSCORRELATION COEFFICIENTS BETWEEN TWO SEPARATE ORDERED SERIES. 5K CORE STORAGE, FLOATING-POINT HARDWARE, I/O TAPE UNITS OR ON-LINE CARD READER AND PRINTER. AUTOCODER-MACHINE LANGUAGE.

7070-11.3.001 STEPWISE MULTIPLE REGRESSION ANALYSIS, MR 1  
AVAILABLE 3RD QUARTER 1962.  
SPECIFY FILE NUMBER 7070-11.3.001

AUTHOR...GARY LOTTO  
UNIVERSITY OF PITTSBURGH  
COMPUTATION AND DATA PROC. CTR.  
UNIVERSITY OF PITTSBURGH  
PITTSBURGH 13, PENNSYLVANIA

CONTINUED FROM PRIOR COLUMN--

DIRECT INQUIRIES TO AUTHOR

THIS PROGRAM WILL REPORT THE RESULTS OF A MULTIPLE REGRESSION ANALYSIS FOR UP TO 130 VARIABLES. INDEPENDENT VARIABLES ARE INTRODUCED ONE AT A TIME IN THE ORDER THAT THEY CONTRIBUTE TO REGRESSION ON THE DEPENDENT VARIABLE. THE PROGRAM IS WRITTEN FOR 10K MACHINE WITH FLOATING POINT HARDWARE. IT MAY BE MODIFIED FOR FIXED POINT HARDWARE, A 5K MACHINE, ETC. STORAGE USED IS A FUNCTION OF THE NUMBER OF VARIABLES INCLUDED. OUTPUT IS PRINTED OR PUNCHED. INPUT IS ON CARDS OR TAPE. THE PROGRAM WILL HANDLE UP TO 130 VARIABLES /APPROXIMATELY 85 VARIABLES ON A 5K MACHINE/. THE OPERATOR MAY, BY MANUAL INTERVENTION, PROHIBIT CERTAIN INDEPENDENT VARIABLES FROM ENTERING INTO REGRESSION, FORCE INCLUSION OR DELETION OF CERTAIN VARIABLES, CHANGE THE DEPENDENT VARIABLE, OR CHANGE THE SIGNIFICANCE LEVELS FOR INCLUSION OR DELETION AT ANY TIME.

7070-11.3.003 INTERCORRELATION MATRIX, CORR1  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 7070-11.3.003

AUTHOR...GARY LOTTO

DIRECT INQUIRIES TO...

UNIVERSITY OF PITTSBURGH  
COMPUTATION AND DATA PROC. CTR.  
UNIVERSITY OF PITTSBURGH  
PITTSBURGH 13, PENNSYLVANIA

THIS PROGRAM WILL REPORT THE VECTOR OF MEANS AND STANDARD DEVIATIONS, THE NUMBER OF CASES, AND THE SYMMETRIC MATRIX OF CORRELATIONS BETWEEN EVERY VARIABLE AND EVERY OTHER OF A SET OF UP TO 130 VARIABLES. THE PROGRAM IS WRITTEN FOR A 10K MACHINE WITH FLOATING POINT HARDWARE AND 1 TAPE UNIT. IT MAY EASILY BE MODIFIED TO USE A 5K MACHINE, AND/OR NO FLOATING POINT HARDWARE /BY SUBROUTINE SIMULATION/ WITH A SUBSEQUENT REDUCTION IN THE MAXIMUM NUMBER OF VARIABLES THAT MAY BE HANDLED AND WITH A POSSIBLE REDUCTION IN THE SPEED OF A PART OF THE PROGRAM. THE AMOUNT OF STORAGE USED IS A FUNCTION OF THE NUMBER OF VARIABLES INCLUDED. INPUT IS ON TAPE. OUTPUT IS PRINTED OR PUNCHED. THE PROGRAM WILL HANDLE UP TO 130 VARIABLES /APPROX. 85 VARIABLES ON A 5K MACHINE/ WITH THE RESTRICTION THAT THE MAXIMUM SUM OF SQUARES /TREATING THE DATA AS WHOLE NUMBERS/ MUST BE LESS THAN 10 TO THE 10TH. THE MATRIX IS LEFT IN STORAGE FOR FURTHER ANALYSIS, IF DESIRED /SEE, FOR EXAMPLE, MR1/.

7070-11.3.004 INTERCORRELATION MATRIX - CORR2 - FOR CARD INPUT  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 7070-11.3.004

AUTHOR...GARY LOTTO

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THIS PROGRAM WILL REPORT THE VECTOR OF MEANS AND STANDARD DEVIATIONS, THE NUMBER OF CASES, AND THE SYMMETRIC MATRIX OF CORRELATIONS BETWEEN EVERY VARIABLE AND EVERY OTHER OF A SET OF UP TO 130 VARIABLES. THE PROGRAM IS WRITTEN FOR A 10K MACHINE WITH FLOATING POINT HARDWARE. IT MAY EASILY BE MODIFIED TO USE A 5K MACHINE, AND/OR NO FLOATING POINT HARDWARE /BY SUBROUTINE SIMULATION/ WITH A SUBSEQUENT REDUCTION IN THE MAXIMUM NUMBER OF VARIABLES THAT MAY BE HANDLED AND WITH A POSSIBLE REDUCTION IN THE SPEED OF A PART OF THE PROGRAM. THE AMOUNT OF STORAGE USED IS A FUNCTION OF THE NUMBER OF VARIABLES INCLUDED. INPUT IS ON CARDS. OUTPUT IS ON THE PRINTER OR ON CARDS. THE PROGRAM WILL HANDLE UP TO 130 VARIABLES /APPROX. 85 VARIABLES ON A 5K MACHINE/ WITH THE RESTRICTION THAT THE MAXIMUM SUM OF SQUARES /TREATING THE DATA AS WHOLE NUMBERS/ MUST BE LESS THAN 10 TO THE 10TH. THE MATRIX IS LEFT IN STORAGE FOR FURTHER ANALYSIS, IF DESIRED.

7070-11.3.005 PRINCIPLE AXIS FACTOR ANALYSIS  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 7070-11.3.005

AUTHOR...A. W. BENDIG  
PSYCHOLOGY DEPARTMENT  
UNIVERSITY OF PITTSBURGH

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TO COMPUTE THE EIGENVALUES AND EIGENVECTORS OF A SQUARE SYMMETRIC MATRIX OF SIZE V. 10 K CORE, FLOATING POINT HARDWARE, CARD READER, ON-LINE PRINTER, GENERAL DESCRIPTION THE VECTORS OF THE RIGHT ORTHONORMAL /EIGENVECTOR/ AND THE ELEMENT OF THE BASIC STRUCTURE DELTA MATRIX /SQUARE ROOTS OF THE EIGENVALUES/ ARE COMPUTED BY AN ITERATIVE POWERING PROCESS UNTIL THE V PAIRS OF EIGENVECTOR ELEMENTS OBTAINED ON TWO SUCCESSIVE ITERATIONS DIFFER BY LESS THAN A PROGRAMMED TOLERANCE VALUE. WHEN THE EIGENVECTOR ELEMENTS ARE STABILIZED, THE VECTOR IS MULTIPLIED BY THE DELTA ELEMENT TO PRODUCE THE FACTOR COEFFICIENTS OR LOADINGS, AND THE EIGENVALUE, EIGENVECTOR, AND FACTOR LOADINGS ARE SENT TO THE OUTPUT ROUTINES.

7070-11.3.007 MULTIPLE CORRELATION AND REGRESSION ANALYSIS BY THE STEPWISE METHOD 1  
AVAILABLE 1ST QUARTER 1962.  
SPECIFY FILE NUMBER 7070-11.3.007

AUTHOR...R. E. BOSS  
IBM CORPORATION  
SYSTEMS ENGINEER-SCIENTIFIC  
LOS ANGELES, WILSHIRE OFFICE

# Contributed Programs

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CONTINUED FROM PRIOR PAGE--

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DIRECT INQUIRIES TO AUTHOR

PURPOSE THE PROGRAM PROVIDES MEANS, STANDARD DEVIATIONS AND SIMPLE CORRELATION COEFFICIENTS FOR ALL VARIABLES. THE STEPWISE METHOD PROVIDES A FINAL REGRESSION EQUATION CONTAINING ONLY THOSE INDEPENDENT VARIABLES INDICATED TO BE SIGNIFICANT. INTERMEDIATE RESULTS INCLUDE THOSE VARIABLES IN THE REGRESSION, AND THE VARIABLE ADDED TO THE EQUATION TO IMPROVE THE /GOODNESS OF FIT/ AT EACH STEP. OTHER RESULTS INCLUDE THE STANDARD ERROR OF EACH REGRESSION COEFFICIENT AND THE ERROR OF ESTIMATE OF THE DEPENDENT VARIABLE, A MULTIPLE CORRELATION COEFFICIENT, AND A COMPARISON OF ACTUAL DATA AND PREDICTED VALUES. VARIABLE TRANSFORMATIONS ARE AVAILABLE. EQUIPMENT SPECIFICATIONS /A/ 5,000 OR 10,000 WORD 7070 /B/ ON-LINE CARD READER /C/ MINIMUM OF THREE TAPES

7070-11.3.008 NORMALIZED VARIMAX FACTOR ROTATION PROGRAM

AVAILABLE 1ST QUARTER 1962.  
SPECIFY FILE NUMBER 7070-11.3.008

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TO ROTATE THE FACTOR LOADINGS OF Y VARIABLES ON F FACTORS TO ORTHOGONAL SIMPLE STRUCTURE. LOW CORE, FLOATING POINT HARDWARE, CARD READER, ON-LINE PRINTER.

7070-11.3.009 STEPWISE MULTIPLE REGRESSION PROGRAM

AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-11.3.009

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ENGINEERING DEPARTMENT  
EXPERIMENTAL STATION  
WILMINGTON, DELAWARE

THIS PROGRAM COMPUTES MULTIPLE LINEAR REGRESSION EQUATIONS BY THE STEPWISE METHOD. OPTIONS ARE PROVIDED TO TRANSFORM VARIABLES /LOG, SQUARE-ROOT, ETC./, TO CREATE NEW VARIABLES /SQUARES, CROSS-PRODUCTS, ETC./, TO CONTROL PRINTING, TO FORCE INCLUSION OF ALL VARIABLES IN THE EQUATION, AND FOR ARBITRARY WEIGHTING OF THE OBSERVATIONS. THE PROGRAM IS WRITTEN IN FORTRAN ASSUMING A 7070 WITH 5,000 WORDS OF STORAGE, 3 TAPE DRIVES, AN ON-LINE PRINTER, AND A CARD READER. AS WRITTEN, THE PROGRAM CAN BE RUN, IF NECESSARY, WITH ONLY TWO TAPES. THE PROGRAM WILL HANDLE UP TO 40 VARIABLES /INDEPENDENT PLUS DEPENDENT/. OUTPUT INCLUDES A LIST OF TRANSFORMED VARIABLES, MEANS, STANDARD DEVIATIONS, SIMPLE CORRELATION MATRIX, VARIABLE ENTERED OR DELETED AT EACH STEP, COEFFICIENTS OF THE CORRESPONDING EQUATIONS, STANDARD ERROR OF ESTIMATE, MULTIPLE CORRELATION COEFFICIENT, OBSERVED AND PREDICTED VALUES, RESIDUALS, AND OTHER PERTINENT INFORMATION.

7070-11.3.011 NON-LINEAR REGRESSION /PEXX, PEDE/

AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 7070-11.3.011

AUTHOR...DONALD I RUBIN  
AMERICAN CYANAMID COMPANY  
SCIENTIFIC & TECHNICAL COMPUTING  
DATA PROCESSING DIVISION  
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DIRECT INQUIRIES TO AUTHOR

THIS IS A SERIES OF TECHNIQUES FOR PERFORMING NON-LINEAR LEAST SQUARES REGRESSION. /PEXX/ THE RESPONSE MODEL IS EXPLICIT AND THE PARTIAL DERIVATIVE OF THE RESPONSE MODEL WITH RESPECT TO THE PARAMETERS IS EXPLICIT. /PEXN/ THE RESPONSE MODEL IS EXPLICIT BUT THE PARTIAL DERIVATIVE WITH RESPECT TO THE PARAMETERS IS PERFORMED NUMERICALLY. /PEDE/ THE RESPONSE IS GIVEN BY A SET OF DIFFERENTIAL EQUATIONS. SOURCE LANGUAGE- FORTRAN II.  
FILE #10.9.001 /MILA/ /GPPA/ FILE #11.3.011 /PEXX/ /PEXN/ /PEDE/  
CALL ON FILE #10.1.013 /MILE/ & FILE #10.1.014 /MATMU/. FILE # 10.1.013 /MILE/ CALLS ON FILE # 10.1.014 /MATMU/. FILE #09.2.001 /SDDE/ /SDXN/ FILE #11.3.011 /PEDE/ CALL ON FILE #09.3.004 /IRK/

7070-11.5.002 ANALYSIS OF VARIANCE - REPEATED MEASUREMENTS

AVAILABLE 4TH QUARTER 1963.  
SPECIFY FILE NUMBER 7070-11.5.002

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DIRECT INQUIRIES TO AUTHOR

COMPUTES AN ANALYSIS OF VARIANCE FOR A TWO-WAY FACTORIAL DESIGN WITH AN ADDITIONAL SPLIT-PLOT VARIABLE /REPEATED TRIALS/. DATA CAN BE GIVEN ONE OF FOUR COMMON TRANSFORMATIONS AND ORTHOGONAL POLYNOMIALS CAN BE USED TO ISOLATE TREND EFFECTS OVER THE SPLIT-PLOT VARIABLE. MACHINE REQUIREMENTS-10K CORE STORAGE, FLOATING-POINT HARDWARE, THREE TAPE UNITS OR ON-LINE CARD READER, PRINTER, AND PUNCH.

IF A AND B ARE THE TWO FACTORIAL VARIABLES AND T THE SPLIT-PLOT VARIABLE, THE PROGRAM COMPUTES THE MAIN EFFECT AND INTERACTION MEAN SQUARES A, B, AB, T, AT, BT, ABT AND TESTS THE FIRST THREE AGAINST THE REPLICATES ERROR TERM AND THE LAST FOUR AGAINST THE REPLICATES TIMES T INTERACTION. THE ANALYSIS MAY BE ON THE ORIGINAL DATA OR ON LOG, SQUARE ROOT, OR RECIPROCAL TRANSFORMED DATA. IF DESIRED, THE PROGRAM USES ORTHOGONAL POLYNOMIALS TO ISOLATE THE POLYNOMIAL COMPONENTS OF THE T, AT, BT, ABT, AND REPLICATES X T MEAN SQUARES AND TESTS THEM FOR SIGNIFICANCE. ALL MEANS ARE PRINTED AND THE AB MEANS AND ERROR TERM CAN BE PUNCHED ON CARDS FOR SUBSEQUENT ANALYSIS IN A MULTIPLE RANGE TEST PROGRAM.

THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL M\*Y BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED. THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH.

7070-11.5.003 DUNCANS MULTIPLE RANGE TEST PROGRAM

AVAILABLE 4TH QUARTER 1963.  
SPECIFY FILE NUMBER 7070-11.5.003

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DIRECT INQUIRIES TO AUTHOR

COMPUTES SIGNIFICANCE OF DIFFERENCES AMONG ALL PAIRS OF K MEANS USING DUNCANS MULTIPLE RANGE PROCEDURE TO CONTROL THE MAGNITUDE OF TYPE I ERROR. MACHINE REQUIREMENTS-5K CORE STORAGE, FLOATING-POINT HARDWARE, THREE TAPE UNITS OR ON-LINE CARD READER. PROGRAM READS IN THE ERROR MEAN SQUARE AND ERROR DEGREES OF FREEDOM FROM AN ANALYSIS OF VARIANCE OF K MEANS, THE MEANS AND THEIR ASSOCIATED NUMBERS OF REPLICATES /NS/, RANKS THE MEANS AS TO MAGNITUDE, AND COMPUTE CRITICAL VALUES FOR DIFFERENCES BETWEEN MEANS AT FOUR TYPE I ERROR PROBABILITY LEVELS /0.10, .05, .01 AND .001/ USING A STORED TABLE OF DUNCANS TEST STATISTIC. PRINTED OUTPUT GIVES EACH PAIR OF MEANS, THEIR DIFFERENCE, CRITICAL VALUES FOR THE DIFFERENCE AT EACH OF THE FOUR PROBABILITY LEVELS, AND THE EXPERIMENTWISE TYPE I ERROR.

7070-11.7.002 RANDOM NUMBER GENERATOR SUBROUTINE

AVAILABLE 3RD QUARTER 1963.  
SPECIFY FILE NUMBER 7070-11.7.002

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A SUBROUTINE TO GENERATE RANDOM NUMBERS, EITHER UNIFORMLY OR NORMALLY DISTRIBUTED, IN FIXED OR FLOATING FORM. FLOATING-DECIMAL DEVICE IS REQUIRED. 101 STORAGE LOCATIONS ARE USED. GENERAL DESCRIPTION- A FINBONACCI SERIES IS USED. SOURCE LANGUAGE- 7070 BASIC AUTOCODER.

7070-11.9.002 ITEM ANALYSIS PROGRAM

AVAILABLE 3RD QUARTER 1962.  
SPECIFY FILE NUMBER 7070-11.9.002

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DIRECT INQUIRIES TO AUTHOR

A. PURPOSE TO PROVIDE A GENERAL PURPOSE PROGRAM FOR ANALYZING INDIVIDUAL ITEMS ON PSYCHOLOGICAL TESTS. B. MACHINE REQUIREMENTS IBM 7070 WITH 10K CORE STORAGE, FLOATING DECIMAL, AND TAPE UNITS OR ON-LINE CARD READER, PRINTER AND CARD PUNCH. C. GENERAL DESCRIPTION THE PROGRAM READS IN CARDS CONTAINING TEST ITEMS AND /OPTIONAL/ CARDS CONTAINING ONE TO THREE CRITERION SCORES PER SUBJECT. THE ITEMS ARE SCORED BY ONE OF THREE ALTERNATIVE OPTIONS, A TOTAL SCORE IS OBTAINED FOR EACH SUBJECT, AND THE ITEMS ARE CORRELATED WITH THE TOTAL AND WITH EACH OF THE OPTIONAL CRITERIA. PRINTED OUTPUT GIVES THE MEANS, STANDARD DEVIATIONS, AND INTERCORRELATIONS OF THE TOTAL SCORE AND THE CRITERIA, THE RELIABILITY OF THE TOTAL SCORE, AND THE MEAN, STANDARD DEVIATION, AND CORRELATIONS WITH THE TOTAL SCORE AND WITH THE CRITERIA FOR EACH ITEM. INDIVIDUAL SCORES PER SUBJECT MAY ALSO BE PRINTED OUT AND/OR PUNCHED ON CARDS. D. CAPABILITIES AND LIMITATIONS ONE TO THREE CRITERION SCORES MAY BE READ IN FOR EACH SUBJECT OR CRITERION MEASURES MAY BE OMITTED. SINGLE-DIGIT ITEM RESPONSES ARE READ IN 75 PER CARD /MAXIMUM OF 600/. KEYS FOR SCORING INDIVIDUAL ITEMS CAN BE READ IN AND ITEMS MAY BE OMITTED FROM SCORING. ZERO VARIANCES DO NOT AFFECT PROGRAM FUNCTIONING.

7070-11.9.003 ITEM ANALYSIS PROGRAM II

AVAILABLE 1ST QUARTER 1963.  
SPECIFY FILE NUMBER 7070-11.9.003

AUTHOR...A. W. BENDIG  
COMPUTATION AND D. P. CENTER  
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DIRECT INQUIRIES TO AUTHOR

COMPUTES STATISTICS USED IN THE ANALYSIS OF PSYCHOLOGICAL TESTS THAT INCLUDE SEVERAL SUBSCALES. 7070 WITH 10K CORE STORAGE, FLOATING-POINT, AND EITHER ON-LINE CARD READER, PRINTER, AND PUNCH OR 3 INPUT-OUTPUT TAPE UNITS.

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7070-12.1.001 THE INVENTORY MANAGEMENT  
SIMULATOR 7070 FULL FORTRAN VERSION.  
AVAILABLE 1ST QUARTER 1963.  
SPECIFY FILE NUMBER 7070-12.1.001

AUTHOR...C. J. WELKER  
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THIS PROGRAM ALLOWS THE USER TO TEST INVENTORY  
REPLENISHMENT RULES AND DEMAND FORECASTING TECHNIQUES- THE  
OBJECTIVE IS TO PROVE THE VALIDITY OF METHODS WHICH CAN  
THEN BE INSTALLED IN THE INVENTORY OPERATING SYSTEM.  
/INCLUDE MACHINE COMPONENTS, SPECIAL FEATURES, STORAGE  
REQUIREMENTS, CONTROL PANELS-STANDARD OR SPECIAL/ 10 K CORE  
MEMORY, CARD READER, FROM ONE TO FIVE TAPE DRIVES  
/DEPENDENT UPON SUBPROGRAM CONFIGURATION USED/  
/MATHEMATICAL METHOD, ACCURACY, SPEED, IF APPROPRIATE/  
MATHEMATICAL METHOD- SIMULATION ACCURACY- NOT APPLICABLE  
SPEED- RUNNING TIMES VARY CONSIDERABLY DEPENDING UPON THE  
SUBPROGRAM CONFIGURATION USED. HOWEVER, EIGHTY TO  
ONE-HUNDRED DEMAND TRANSACTIONS PER MINUTE CAN SERVE AS A  
REASONABLE ESTIMATE.

7070-12.1.002 WAREHOUSE CONTROL SIMULATION  
USING MONTE CARLO TECHNIQUES  
AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-12.1.002

AUTHOR...GEORGE S. MORGAN  
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FOR A FIXED QUANTITY-REORDER INVENTORY SYSTEM TO TEST OR  
SEEK DESIRED INVENTORY POLICIES DIRECTED TOWARD MINIMIZING  
THE TOTAL VARIABLE COSTS OF PACKAGING AND WAREHOUSING  
WITHIN A STATED SERVICE POLICY. OPTIONS EXIST TO COMPUTE  
THE OPTIMUM REORDER POINT. 5K 7070, FLOATING POINT  
HARDWARE, CARD READER, CARD PUNCH. THERE IS NO LIMIT ON  
THE NUMBER OF PRODUCTS. THE TOTAL DAILY DEMANDS AND  
REPLENISHMENTS MUST NOT EXCEED 99,999 UNITS A DAY.

7070-12.9.001 TRANSPORTATION PROBLEM  
/DENNIS TECHNIQUE  
AVAILABLE 4TH QUARTER 1961.  
SPECIFY FILE NUMBER 7070-12.9.001

AUTHOR...ROBERT JUDSON  
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TO SOLVE FAIRLY LARGE TRANSPORTATION PROBLEMS IN  
REASONABLY SHORT TIMES USING MAGNETIC TAPE TO STORE SUPPLY,  
DEMAND AND COST DATA. ALSO TO PERMIT SUPPRESSION OF ANY  
DESIRED SHIPPING PATHS, EVEN TO THE EXTENT OF SUPPRESSING  
AN ENTIRE ROW /WHICH ESSENTIALLY BECOMES AN ARTIFICIAL  
VECTOR/. 3 TAPE UNITS AND 5K MEMORY. TO SOLVE ANY PROBLEM  
BETWEEN 50 X 500 AND 275 X 275. PROGRAM WILL BE FURNISHED  
IN SYMBOLIC AUTOCODER FORM SO THAT IT CAN BE READILY  
MODIFIED FOR A 10K OR LARGER MEMORY. 118 X 12 APPROX. 70  
SECONDS WITH 1/3 COSTS EXCLUDED 12 X 118 APPROX. 90 SECONDS  
WITH 1/3 COSTS EXCLUDED

7070-12.9.003 TRANSPORTATION PROBLEM  
/DENNIS TECH/ WITH ZERO COSTS ALLOWED & SHADOW PRICES LISTED IN OUTPUT  
AVAILABLE 2ND QUARTER 1962.  
SPECIFY FILE NUMBER 7070-12.9.003

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TO SOLVE FAIRLY LARGE TRANSPORTATION PROBLEMS IN  
REASONABLY SHORT TIMES USING MAGNETIC TAPE TO STORE SUPPLY,  
DEMAND AND COST DATA. ALSO TO PERMIT SUPPRESSION OF ANY  
DESIRED SHIPPING PATHS, EVEN TO THE EXTENT OF SUPPRESSING  
AN ENTIRE ROW / WHICH ESSENTIALLY BECOMES AN ARTIFICIAL  
VECTOR/. 3 TAPE UNITS AND 5K MEMORY. TO SOLVE ANY PROBLEM  
BETWEEN 50 X 500 AND 275 X 275.

7070-12.9.004 CLASS SCHEDULING PROGRAM FOR  
THE 7070/74 AND 1401  
AVAILABLE 1ST QUARTER 1963.  
SPECIFY FILE NUMBER 7070-12.9.004

AUTHOR...GIB AKIN  
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THIS PROGRAM SCHEDULES CLASSES FOR STUDENTS OF SECONDARY  
SCHOOLS- APPROXIMATELY 100 SCHOOLS HAVE USED THIS PACKAGE  
FOR SCHEDULING PURPOSES. 1401 WITH 4K, 2 TAPE DRIVES,  
HIGH-LOW-EQUAL COMPARE, ADVANCED PROGRAMMING AND SENSE  
SWITCHES. 7070/74 WITH 10K, 2 CHANNELS, 7501 AND AT LEAST  
4 TAPES.

THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM MATERIAL MAY  
BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED. THE TAPE PROVIDED  
MUST BE 2400 FEET IN LENGTH. \*

7070-13.2.001 CONSOLE EXERCISE  
AVAILABLE 2ND QUARTER 1963.  
SPECIFY FILE NUMBER 7070-13.2.001

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THE CONSOLE EXERCISE IS DESIGNED TO FAMILIARIZE OPERATORS  
AND PROGRAMMERS WITH THE CONSOLE OPERATION OF THE 7070/2/4.  
IT DEMONSTRATES THE USE OF TAPE INITIAL AND FINAL STATUS WORDS,  
ADDRESS STOPPING, AND THE CE TAPE CONSOLE. IT ALSO DEMONSTRATES  
ERRORS AND THEIR DETECTION. MACHINE REQUIREMENTS- 7070/2/4-  
THREE TAPE DRIVES. 7501 CONSOLE CARD READER, AND FLOATING  
POINT ARITHMETIC.\*

THE PROGRAM IS SUPPLIED IN BOTH BASIC AUTOCODER UNASSEMBLED  
FORM AND IN ASSEMBLED 5/CD. FORMAT. AFTER LOADING, THE PROGRAM  
DEMONSTRATES VARIOUS CONSOLE FEATURES. IT ALLOWS AT  
PROGRAMMED HALTS, THE OPERATOR TO TRY VARIOUS FACETS OF THE  
CONSOLE OPERATION, AS WELL AS SOME METHODS OF ERROR DETECTION  
AND CORRECTION. OPERATING INSTRUCTIONS ARE SELF CONTAINED IN  
THE PROGRAM, AND ARE TYPED AS NEEDED.

\*7501 AND FLOATING POINT SECTIONS ARE EASILY BYPASSED IF THE  
PARTICULAR MACHINE IS NOT EQUIPPED WITH THESE FEATURES.

## 7080

7080-01.9.003 RECON  
AVAILABLE 1ST QUARTER 1965.  
SPECIFY FILE NUMBER 7080-01.9.003

AUTHORS..H.R. LANDOW C.S. WESTERMAN

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THESE IBM 7080 PROGRAMS PROVIDE AN AID TO CONVERSION OF IBM  
705 I-II SOURCE PROGRAMS BY DYNAMIC TRACING OF IBM 705 MACHINE  
LANGUAGE SOURCE PROGRAMS AND SUMMARIZING INFORMATION OBTAINED  
DURING TRACING. RECON1 TRACES THE SOURCE PROGRAM  
AND RECORDS INFORMATION ON ITS EXECUTION. THE REMAINING PROGRAMS  
SUMMARIZE THE TRACE INFORMATION IN THE FORM OF 705 AUTOCODER  
SYMBOLIC STATEMENTS. RECON2 SUMMARIZES THE OPERATION OF THE  
SOURCE PROGRAM IN ORDER OF MEMORY LOCATION OF EACH  
INSTRUCTION EXECUTED. RECON3 SUMMARIZES SOURCE PROGRAM EXECUTION  
IN ORDER OF MEMORY LOCATION, I/O DEVICE OR LITERAL REFERRED TO  
IN EACH INSTRUCTION. RECON4 SUMMARIZES EVERY PROGRAM BRANCH OR  
HALT IN INSTRUCTION EXECUTION ORDER. RECON5 IS A MULTIPHASE  
PROGRAM WHICH COMBINES INFORMATION PRODUCED BY RECON2 AND RECON3  
WITH MEMORY UTILIZATION INFORMATION PROVIDED BY THE USER.  
MAXIMUM MACHINE REQUIREMENTS ARE A 160K 7080 WITH TWO 729  
CHANNELS /CH. 1, 4 T/U., CH. 2, 3T/U/ AND CARD READER. RECON1  
IS WRITTEN IN AUTOCODER FOR THE 7058 PROCESSOR. RECON2 - 5 ARE  
WRITTEN IN COBOL.

THE ONE REEL OF TAPE REQUIRED TO OBTAIN THE BASIC PROGRAM  
MATERIAL MAY BE ORDERED FROM YOUR IBM REPRESENTATIVE OR SUPPLIED.  
THE TAPE PROVIDED MUST BE 2400 FEET IN LENGTH. \*\*

7080-02.1.006 SORTF /SORT FILE/ MACRO FOR  
7080 PROCESSOR  
AVAILABLE 4TH QUARTER 1963.  
SPECIFY FILE NUMBER 7080-02.1.006

AUTHORS..MR. O. TIDWELL MISS A. RENO MR. P.T. REZK

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TO SORT IN SEQUENCE ANY NUMBER OF RECORDS, ALL THE SAME LENGTH,  
MULTIPLE OF 5 AND DEFINED AS ENDING IN A RECORD MARK. THE MACRO  
PROVIDES LINKAGES TO THE PROGRAMMER'S ROUTINES TO READ THE FILE  
WRITE THE SORTED RECORDS OUT. INTENDED FOR USE WITH MULTI-PHASE  
PROGRAMMING AND SMALL VOLUMES OF RECORDS, SORTF WILL PROPERLY  
PROCESS UP TO A FULL REEL OF TAPE, BUT WOULD TAKE AN EXTREMELY  
LONG TIME FOR SUCH A VOLUME, SINCE THE TIME GOES UP AS THE  
SQUARE OF THE NUMBER OF RECORDS. FOR EXAMPLE, A FULL REEL OF 80  
CHARACTER UNBLOCKED RECORDS WOULD TAKE ABOUT 5 HOURS TO PROCESS  
ON THE 7080. FOR 7080, 4000 80-CHARACTER RECORDS WILL BE HANDLED  
MORE EFFICIENTLY THAN BY SORT80 WHEN SETUP TIME IS CONSIDERED.  
MACHINE REQUIREMENTS-7080, 2 CHANNELS.  
INTENDED FOR INSERTION INTO 7080 PROCESSOR LIBRARY, VERSION 7  
/OR LATER/.

7080-03.4.009 CMP700-TAPE COMPARE PROGRAM  
AVAILABLE 4TH QUARTER 1963.  
SPECIFY FILE NUMBER 7080-03.4.009

AUTHOR...E.D. HUNTINGTON

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WASHINGTON 25, D.C.  
ATTN. MR. E.D. HUNTINGTON

A PROGRAM FOR COMPARING FIXED OR VARIABLE LENGTH TAPE RECORDS.  
WRITTEN IN AUTOCODER III FOR IBM 70511/7080 80K USING IBM IOCS  
FOR 70511. ADAPTABLE TO 40K BY CHANGING LOCATIONS OF READ-IN/  
WORK AREAS. CMP700 WAS WRITTEN FOR TWO CHANNELS. MAY BE  
MODIFIED FOR ONE CHANNEL BY CHANGING CHANNEL TABLE TAPE  
ADDRESSES.



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THROUGH USE OF CONTROL CARD, CMP700 WILL-  
 A. COMPARE FIXED-LENGTH TO FIXED-LENGTH RECORDS, VARIABLE-LENGTH  
 TO VARIABLE-LENGTH RECORDS OR FIXED-LENGTH TO VARIABLE-LENGTH  
 RECORDS.  
 B. ACCEPT TAPES WITH STANDARD OR NON-STANDARD HEADERS /AS DEFINED  
 IN 705111 IOCS MANUAL C28-6109/.  
 C. SKIP ANY DATA RECORD WITHIN A BLOCK.  
 D. DELETE AS MANY AS 765 CHARACTERS FROM THE DATA RECORDS FOR  
 COMPARING.  
 E. SEQUENCE CHECK INPUT TAPES.  
 F. MAINTAIN PHASING WHEN SEQUENCE CHECKING IS USED.  
 MAXIMUM TAPE RECORD LENGTH-6000 CHARACTERS. MAXIMUM DATA RECORD  
 LENGTH-3000 CHARACTERS. MAXIMUM LENGTH MAY BE INCREASED BY  
 RELOCATING AND EXTENDING INPUT AND WORK AREAS. ASSEMBLY LISTING  
 AVAILABLE AS OPTIONAL MATERIAL.

7080-07.9.001 M.A.S.A. METHODS AND  
 STANDARDS AUTOMATION  
 AVAILABLE 3RD QUARTER 1963.  
 SPECIFY FILE NUMBER 7080-07.9.001

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THE PURPOSE OF M.A.S.A. IS TO AID IN THE DEVELOPMENT AND  
 MAINTENANCE OF AN ACCURATE WORK MEASUREMENT SYSTEM. L. GENERAL-IT  
 PROVIDES A -/LOCKED IN SYSTEM/, BETWEEN METHOD AND TIME IN THAT  
 THE SAME PERSON RECORDS BOTH. IT EXTENDS AND COMPILES THE  
 PREDETERMINED TIME ELEMENTS IN SEQUENCE FOR THE TIMING OF MANUAL  
 MOTIONS & PROCESS TIMES. IT PROVIDES A METHODS DOCUMENT FOR THE  
 OPERATOR DEFINING THE MOTION PATTERN ANALYZED BY THE INDUSTRIAL  
 ENGINEER, AND CREATES LINE NUMBER CONTROL FOR EASE OF  
 MAINTENANCE. MAY PROCESS UP TO 50,000 RECORDS PER RUN. THESE  
 ARE OVERALL RECORDS AND NOT INPUT RECORDS. 7080, 160K, 2  
 CHANNELS, 20 DRIVES, CARD READER, PRINTER OR TYPEWRITER-1401, 8K,  
 4 DRIVES, PRINTER AND PUNCH, INDEXING & MULTIPLY-DIVIDE FEATURES.  
 SOURCE LANGUAGE- AUTOCODER. EXECUTION TIME- INPUT CONTROLLED,  
 BY CONTROL CARD TO FIRST 1401 PROGRAM- ALLOWS LIMITING OF INPUT  
 DATA TO ALLOTTED 7080 TIME.

7080-08.3.001 SQUARE ROOT MACRO AND  
 SUBROUTINE  
 AVAILABLE 4TH QUARTER 1963.  
 SPECIFY FILE NUMBER 7080-08.3.001

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THE MACRO CALLS UPON A CLASS B SUBROUTINE WHICH USES  
 NEWTONS ITERATION METHOD TO DETERMINE THE SQUARE ROOT OF A  
 NUMBER FROM ONE TO FIFTEEN SIGNIFICANT DIGITS. FORTRAN FLOATING  
 POINT CODING AND SUBROUTINES ARE NOT REQUIRED. ROOT PRECISION  
 IS CONTROLLED BY DECIMAL DEFINITION OF THE AUTOCODER RCD. THE  
 PROGRAM IS OPERATIVE ON THE IBM 7080. STORAGE REQUIREMENTS ARE-  
 400 POSITIONS FOR THE SUBROUTINE AND 35 POSITIONS IN LINE FOR  
 EACH MACRO ENTRY. THE SOURCE LANGUAGE USED IS 7080 AUTOCODER.

## List of Program Deletions

### ALPHABETIC KEY - REASON FOR REMOVAL

- A - This Program Has Been Deleted Because of Low Usage
- C - This Program Has Been Deleted Because of Limited Usefulness
- D - This Program is Obsolete and Replaced by File Number \_\_\_\_\_ .

FILE NUMBER	TITLE	REASON FOR DELETION
	0705	
02.5.002	BINARY TABLE SEARCH	A
11.1.004	TVTSDA-TIME SERIES DECOMPOSITION AND ANALYSIS PROGRAM	A
	1410	
14.3.002	SERVICE REQUEST PROGRAM	A
	7070	
01.3.001	RIOT-ROCHESTER INPUT/OUTPUT TECHNIQUE	A
03.2.002	MONITOR 62	A
03.4.001	TAPE COPY ROUTINE	A
04.1.001	COMPARISON DUMP	A
04.2.001	TRACE ROUTINE	A
04.4.002	PAT COMPILER SYSTEM	A
04.9.001	T-TEST PROGRAM FOR INDEPENDENT GROUPS	A
05.1.002	STIMULATION OF BASIC 650 ON BASIC 7070	A
08.1.006	SUBROUTINE FOR IBM 7070	A
08.1.022	DOUBLE PRECISION SINE-COSINE SUBROUTINE	A
08.2.004	SUBROUTINE LOGEX FOR IBM 7070	A
08.2.005	LOGARITHM SUBROUTINE	A
08.3.005	CUBE ROOT SUBROUTINE	A
08.3.006	DOUBLE PRECISION SQUARE ROOT SUBROUTINE	A
08.3.012	7070/74 FIXED POINT SQUARE ROOT SUBROUTINE	A
08.5.001	COMPLEX ARITHMETIC SUBROUTINE	A
09.1.003	POLYNOMIAL ROOT ROUTINE WITH POLYNOMIAL ROOT EXPANSION	A
10.1.001	DOUBLE PRECISION MATRIX MULTIPLICATION	A
10.1.016	MAMU/SUBROUTINE FOR A-74/	A
10.1.017	MAMU/SUBROUTINE FOR A-74/	A
10.4.002	SLEP; SOLVE SIMULTANEOUS LINEAR EQUATIONS WITH PIVOTING	A
10.4.003	NEWTON-RAPHSON SOLUTION OF SIMULTANEOUS NON-LINEAR EQUATIONS	A
11.3.012	OBLIMAX FACTOR ROTATION PROGRAM	A
11.5.004	HOMOGENIETY OF VARIANCE PROGRAM	A
11.7.001	RANDOM NUMBERS AND RANDOM NORMAL DEVIATES GENERATOR	A
	7740	
7740-SP-156	ASSEMBLY PROGRAM USING THE IBM 1401/REPLACED BY FILE NO. 1401-SP-156/	D

## READER'S COMMENT FORM

Catalog of Programs for IBM 705 - 1410 - 7010 -  
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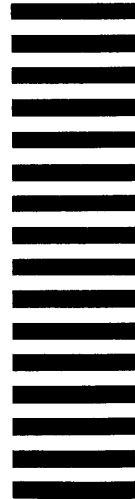
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