



Systems Reference Library

Catalog of Programs for IBM 1130 Computer System and IBM 1800 Data Acquisition and Control System December 1966

This Catalog contains a complete listing of all programs available for the IBM 1130 Computer System and IBM 1800 Data Acquisition and Control System.

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
Catalog of Programs for IBM 1130 Computer System and IBM 1800 Data Acquisition and Control System	C20-1630	N20-0031

This Catalog contains a complete listing of all programs available for the IBM 1130 Computer System and the IBM 1800 Data Acquisition and Control System.

To assist you further 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.

COMMON is an organization of users of IBM 1620, 1710, 1130, 1800 and System/360 Data Processing Systems.

Through the discussion of programming and operational techniques, and the establishment of standards for communicating programming information, this organization directs itself to more profitable utilization of IBM Data Processing Systems installed within the membership.

To obtain information regarding membership contact your IBM Representative.

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 800 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 Customers

World Trade customers 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.

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
#ASSEMBLER LANGUAGE	1800 AS-006	003
#ASSEMBLER LANGUAGE	1800 AS-005	003
#ASSEMBLER PROGRAM	1130 SP-001	002
#ASSEMBLER PROGRAM	1130 SP-002	003
SYSTEM FAULT CURRENT#CALCULATION OF ELECTRICAL DISTRIBUTION S	1130 13.0.002	007
#GAS CHROMATOGRAPH MONITORING PROGRAM	1800 23.5.001	008
E IBM 1130, FORTRAN CODED, CRITICAL PATH #CPM/PERT FOR TH	1130 10.3.001	007
#1130 4K CCGC	1130 16.2.002	008
#CCMET COMMERCIAL SUBROUTINES	1130 03.0.002	007
#IBM 1130 COMMERCIAL SUBROUTINE PACKAGE	1130 SE-25X	002
#COMET COMMERCIAL SUBROUTINES	1130 03.0.002	007
#FCRTRAN CCMPILER	1130 FC-001	001
#FCRTRAN CCMPILER	1130 FO-002	001
#FCRTRAN CCMPILER	1800 FO-007	004
#FCRTRAN CCMPILER	1800 FO-008	004
IRECT DIGIT PROCESS CNTRCL #DDC D	1800 23.5.002	008
#HEURISTIC CCRRUGATOR SCHEDULING PROGRAM	1130 15.2.001	008
#PAYROLL AND LABOR COST DISTRIBUTION PACKAGE DEMONSTRATION	1130 30.1.001	008
, CRITICAL PATH #CPM/PERT FOR THE IBM 1130, FORTRAN CODED	1130 10.3.001	007
130, FORTRAN CODED, CRITICAL PATH #CPM/PERT FOR THE IBM 1	1130 10.3.001	007
BUTION SYSTEM FAULT CURRENT#CALCULATION OF ELECTRICAL DISTRI	1130 13.0.002	007
#DDC DIRECT DIGIT PROCESS CONTROL	1800 23.5.002	008
ISTRIBUTION PACKAGE DEMONSTRATION #PAYROLL AND LABOR COST D	1130 30.1.001	008
#RETAINING WALL DESIGN	1130 16.2.003	008
#DDC DIRECT DIGIT PROCESS CNTRCL	1800 23.5.002	008
#DDC DIRECT DIGIT PROCESS CONTROL	1800 23.5.002	008
#DISK MONITOR PROGRAMMING SYSTEM	1130 OS-001	002
#DISK MCNITOR PROGRAMMING SYSTEM	1130 OS-002	002

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.

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

/AS/	Assembly Systems
/CB/	COBOL - Common Bus. Oriented Language
/CL/	Control Programs
/CQ/	Communications Input/Output
/CV/	Conversion Programs
/DC/	Diagnostic
/DM/	Data Management
/DN/	Diagnostic Programs
/ED/	Editor
/EU/	Emulator Programs
/FO/	FORTTRAN - Formula Translation
/IO/	Input/Output
/LD/	Loader
/LM/	Library Material
/MI/	Miscellaneous
/OS/	Operating Systems
/PL/	Programming Language/I Compiler
/PT/	Program Testing Aids
/RC/	Remote Computing
/RG/	Report Generators
/SI/	Simulator Programs
/SM/	Sort/Merge
/SV/	Supervisory Systems
/UT/	Utility Programs

Application Programs Type II

Industry-Oriented Programs

Distribution

/DP/	Publishing
/DR/	Retail
/DW/	Wholesale
/DX/	Other

Finance

/FB/	Banking
/FF/	Finance Companies
/FI/	Brokerage and Investment
/FX/	Other

Federal Government

/GF/	Government, Federal
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Insurance

/IB/	Blue Cross and Blue Shield
/IF/	Fire and Casualty
/IL/	Life
/IX/	Others

Manufacturing

/MA/	Aerospace
/ME/	Electrical and Machinery
/MD/	Drug, Food, Chemical Products
/MF/	Fabrication and Primary Metals
/MP/	Petroleum and Industrial Chemicals
/MR/	Transportation Equipment
/MT/	Textiles and Paper
/MX/	Other

Service

/SC/	Communications
/ST/	Transportation
/SU/	Utilities
/SX/	Other

Universities and Government

/UC/	Colleges and Universities
/UG/	Government, State and Local
/UH/	Hospital and Medical
/US/	Secondary Schools
/UX/	Other

Industry-Independent Programs

Cross Industry Group

/CA/	Statistical Applications
/CC/	Process Control
/CM/	Mathematical Applications
/CN/	Numerical Control Applications
/CO/	Operations Research
/CP/	Critical Path Scheduling
/CR/	Information Retrieval
/CS/	Simulators
/CX/	Other

Engineering

/EC/	Civil Engineering
/EE/	Electrical Engineering
/EH/	Chemical Engineering
/EM/	Mechanical Engineering

/EN/	Nuclear Codes	5 Conversion and/or Scaling
/EO/	Optics	6 Character and Symbol Manipulation
/EX/	Other	7 Information Classification and Retrieval
Exploratory		8 List Processing
/XP/	Mathematics and Applications	Input 07.
Type III and IV Programs		0 Unclassified
Utility (External) Programs 00.		1 Binary
0 Unclassified		2 Octal
1 Multiple Utility		3 Decimal
2 Flowcharting		4 BCD
3 Tape Handling		5 Hexadecimal
4 Disk Handling		6 Composite
5 Drum and Direct Data Devices		Output 08.
6 Graphic Display Devices		0 Unclassified
Utility (Internal) Programs 01.		1 Binary
0 Unclassified		2 Octal
1 Loading		3 Decimal
2 Clear/Reset memory		4 BCD
3 Check Sum Accumulative and Correction		5 Hexadecimal
4 Internal Housekeeping		6 Plotting
5 Dump to Reload		7 Display
6 File Organization		8 Composite
Diagnostics 02.		Elementary and Arithmetic Functions 09.
0 Unclassified		0 Unclassified
5 Status recorders		1 Floating Point Arithmetic
Programming Systems 03.		2 Complex Arithmetic
0 Unclassified		3 Roots and Powers
1 Assemblers		4 Trigonometric
2 Compilers		5 Hyperbolic, Exponential and Logarithmic
3 Interpretive Systems		6 Geometry
4 Input/Output Control		7 Interpolation, Curve Fitting and Smoothing
5 Report Generators		8 Real and Decimal Numbers
6 Preprocessing and Editing		9 Logical and Rounded
Testing and Debugging 04.		Mathematical Routines 10.
0 Unclassified		0 Unclassified
1 Dumping		1 Functional Subroutine
2 Tracing		2 Polynomial and Related Routines
3 Test Data Preparation		3 Numerical Integration
4 Testing Systems		4 Numerical Solutions of Differential Equations
5 Break Point Printing		5 Matrix Operations
6 Memory Verification and Searching		6 Eigenvalues and Eigenvectors
Executive Routines 05.		7 Determinants
0 Unclassified		8 Simultaneous Linear and Non-Linear Equations
1 Monitor		9 Vector Analysis
2 Supervisor		Simulation 11.
3 Disassembly and Derelativizing		0 Unclassified
4 Relativizing		1 Computers
5 Relocation		2 Peripheral Equipment
Data Handling 06.		3 System component or feature
0 Unclassified		4 Pseudo-Computer
1 Sorting		Conversion 12.
2 Merging		0 Unclassified
3 Data Transmission		1 Data Conversion
4 Table Operations		2 Computer Language Translators

- Statistical 13.
- 0 Unclassified
 - 1 Descriptive
 - 2 Univariate and Multivariate Parametric
 - 3 Non-Parametric
 - 4 Time Series and Auto Correlation
 - 5 Probability Distribution Sampling, and Random Number Generators
 - 6 Correlation and Regression Analysis
 - 7 Analysis of Variance and Covariance
 - 8 Sequential Analysis
 - 9 Discriminant Analysis
- Management Science 15.
- 0 Unclassified
 - 1 Simulations
 - 2 Linear Programming
 - 3 Non-linear Programming
 - 4 Scheduling
 - 5 Games, Game Like Models and Game Theory
 - 6 General Problem Solvers
 - 7 Inventory Control
- Engineering 16.
- 0 Unclassified
 - 1 Aeronautical
 - 2 Civil
 - 3 Chemical
 - 4 Electrical
 - 5 Mechanical and Hydraulic
 - 6 Petroleum
 - 7 Nuclear
 - 8 General
- Sciences 17.
- 0 Unclassified
 - 1 General Physics
 - 2 Nuclear Physics
 - 3 Chemistry
 - 4 Geology, Oceanography and Geophysics
 - 5 Biology
 - 6 Social and Behavioral
 - 7 Astronomy and Celestial Navigation
- Nuclear Codes 18.
- 0 Unclassified
- Financial 19.
- 0 Unclassified
 - 1 Investing and Borrowing
 - 2 Capital Stock
 - 3 Taxes
 - 4 Cash Custody and Forecasting
 - 5 General Accounting
 - 6 Auditing
- Cost Accounting 20.
- 0 Unclassified
 - 1 Material Only
 - 2 Labor Only
 - 3 Work in Progress
- Payroll and Benefits 21.
- 0 Unclassified
 - 1 Payroll
 - 2 Employee Benefits
 - 3 Profit Sharing
 - 4 Retirement
 - 5 Insurance
 - 6 Credit Union
- Personnel 22.
- 0 Unclassified
 - 1 Recruiting and Hiring
 - 2 Inventorying Employees
 - 3 Training
 - 4 Performance Review
 - 5 Administering Wages and Salary
- Manufacturing 23.
- 0 Unclassified
 - 1 Scheduling/Loading
 - 2 Job Reporting
 - 3 Bill of Materials Processors
 - 4 Numerical Control
 - 5 Control Systems
- Quality Assurance/Reliability 24.
- 0 Unclassified
 - 1 Testing
 - 2 Performance Analysis
- Inventory - Raw and Finished and Equipment Tools
- 0 Unclassified
 - 1 Stocking and Issuing
 - 2 Inventory Analysis
 - 3 Equipment Inventory and Maintenance
- Purchasing 26.
- 0 Unclassified
 - 1 Preparing Purchase Orders
 - 2 Matching Invoices
 - 3 Accounts Payable
 - 4 Purchase Analysis
- Marketing 27.
- 0 Unclassified
 - 1 Sales and Billings Forecasting
 - 2 Promotion and Advertising
 - 3 Bid or Request Analysis
 - 4 Distributor or Territory Analysis
- Sales Entered and Billed 28.
- 0 Unclassified
 - 1 Order Entry and Scheduling
 - 2 Invoicing
 - 3 Accounts Receivable
 - 4 Sales and Billing Analysis
 - 5 Backlog Reporting
- General Services 29.
- 0 Unclassified
 - 1 Records Retention
 - 2 Forms Management
 - 3 Standards
 - 4 Transportation
 - 5 Printing and Reproduction

- Demonstrations 30.
 0 Unclassified
 1 Display
 2 Participation

- Unclassified 31.
 0 Miscellaneous

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>
1130	SP-001
1130	03.0.002

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, the file numbers consist of an alphabetical and numeric reference.

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.

List of New Programs

This Section consists of a list of new Programs added since the last Supplement to the Catalog and a list of all Programs added since the last edition of the Catalog.

PROGRAM CORRECTIONS AND REVISION

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. 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 because of limited usefulness.
- D - This program is obsoleted and replaced by file number -----.
- E - This program has been withdrawn by the COMMON organization.

F - This program has been withdrawn by the author.

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
16.2.002	1130	11-15-66

LIST OF NEW PROGRAMS CONTRIBUTED PROGRAMS

FILE NUMBER	TITLE	PAGE
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1130 NEW ENTRIES

03.0.003	STUDENT INFORMATION SYSTEM	7
05.1.001	ELECTRIC POWER SYSTEM LOAD FLOW PROGRAM	7
10.3.001	CPM/PERT FOR THE IBM 1130, FORTRAN CODED, CRITICAL PATH SCHEDULING WITH PROBABILITY ANALYSIS	7
13.0.001	STEP-WISE MULTIPLE REGRESSION PROGRAM	7
13.0.002	CALCULATION OF ELECTRICAL DISTRIBUTION SYSTEM FAULT CURRENTS	7
15.2.001	HEURISTIC CORRUGATOR SCHEDULING PROGRAM	8
16.2.003	RETAINING WALL DESIGN	8

1800 NEW ENTRIES

23.5.001	GAS CHROMATOGRAPH MONITORING PROGRAM	8
23.5.002	DDC DIRECT DIGIT PROCESS CONTROL	8

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	BEFCRE	EIGHT	IT	PROGRAMS	TRCUGHS
ABCLT	BEING	EITHER	ITS	PLT	TFREE
ABOVE	BELCNG	ENG	ITSELF	C	THRCLGH
ACCCMPANYING	BELCw	ET	IV	R	THRU
ACCCRCING	BEST	ETC	J	RECENT	TC
ACHIEVED	BETTER	EXPLANATION	K	REGARDING	TCGETHER
ACHIEVEMENTS	BETWEEN	EXTREMELY	KEPT	RELATEC	TCIAL
ACHIEVES	BEYOND	F	L	RELATING	TCIALLY
ACCLTRED	BIG	FAR	LARGE	RELATION	TCWARC
ACROSS	BOTH	FAST	LARGER	RELATIONSHIP	TCWARDS
ADAPTATION	BRIEF	FEW	LIKE	RELATIONSHIPS	TRI
ADDITIONAL	BRIEFLY	FEWER	LIKELY	RELATIVES	TWC
ADVANTAGE	BRING	FIFTH	LONG	REQUIRE	U
ADVANTAGES	BLT	FINAL	LCKK	REQUIRED	UNDER
AFFECT	BY	FIRST	LCW	REQUIRES	UNTIL
AFFECTED	C	FIVE	LCWER	REQUIRING	UP
AFFECTING	CALLED	FOR	LTC	RESULTING	LPCN
AFFCRING	CAN	FCLR	M	RESULTS	USAGE
AFTER	CAPABILITIES	FCLRTEN	MADE	RCLTINE	LSE
AGAIN	CAPABILITY	FCLRTH	MAKE	S	LSED
AGAINST	CAPABLE	FRM	MAKES	SCHEME	LSEFUL
Aimed	CAUSE	FT	MAKING	SCHEMES	LSEFULNESS
ALL	CAUSED	FULL	MANY	SEC	USER
ALLEGED	CAUSES	FULLY	MEANS	SECONDARY	USERS
ALLCH	CALSIING	FLACDMENTALS	PET	SEE	USES
ALLCHED	CERTAIN	FURTHER	METHCC	SEEMS	USING
ALLCHING	CHALLENGE	G	METHCCS	SEEN	LUTILIZATION
ALLCHS	CHIEF	GAVE	MCRE	SELF	LUTILIZE
ALPCST	CC	GENERAL	MCST	SEVEN	LUTILIZING
ALCNE	CCME	GENERALLY	MPH	SEVENTH	V
ALCNG	CCMING	GIVE	MULTIPLE	SEVERAL	VARICLS
ALSC	CCMPANIES	GIVEN	MY	SHORT	VARYING
APCNG	CCMPANY	GIVES	N	SHORTER	VERSUS
AN	CCMPLETE	GIVING	NEAR	SIGNIFICANCE	VERY
ANALYSES	CCMPLETEC	GCCD	NEARLY	SIGNIFICANT	VI
ANALYSIS	CCMPLETELY	GREATR	NECESSARY	SIMILAR	VIA
ANALYZING	CCMPRISING	GREATLY	NEEC	SIMPLE	VII
AND	CCNCERNEC	GLIDE	NEECED	SIMPLER	VIII
AND/CR	CCNCERING	H	NECS	SIMPLY	VS
ANCTHER	CCNSIDERATION	HAC	NEW	SINCE	W
ANY	CCNSIDERATIONCS	HAS	NEWER	SINGLE	WAS
APART	CCNSIDERED	HAVE	NEWLY	SIX	WFAT
APPARENT	CCNSIDERING	HAVING	NEXT	SIXTH	WFEN
APPARENTLY	CCNSISTING	HE	NINE	SLC	WHERE
APPEAR	CCNVENIENT	HIGH	NC	SLCwLY	WFEREbY
APPEARING	CCRP	HIGHER	NCT	SMALL	WFICH
APPLICABILITY	CCRPCRATICN	HIGHLy	NCw	SMALLER	WHILE
APPLICABLE	CCULD	HIS	C	SMALLEST	WFC
APPLICATION	CPS	Hw	CBERVED	SC	WHCSE
APPLICATIONS	C	I	CBTAINABLE	SCME	WHY
APPLIED	DATA	IBP	CBTAINED	SPECIAL	WILL
APPLY	DE	IF	CBTAINING	SCBRCUTINE	WITH
APPLYING	DEG	II	CCURRING	SLCH	WITHIN
APPRECIABLE	DEPARTMENT	III	CF	SLGGSTEC	WITHCLT
APPRCACH	DEPARTMENTS	IMPLICATIONS	CFE	SLGGSTICNS	WCLLC
APPRCACHES	DEPCNCING	IMPRTANCE	CN	SLITABLE	X
APPRCACHING	DEPT	IMPRTANT	CNE	SLMRY	XI
ARE	DETERMINATION	IMPRCVED	CNLY	SLRVEY	XII
ARISE	DETERMINE	IMPRCVEMENT	CNTC	SYSTEM	XIII
ARISING	DETERMINEC	IMPRCVEMENTS	CR	SYSTEMS	Y
ARCUND	DETERMINING	IMPRCVING	CTHER	T	YET
AS	CI	IN	CLR	TAKE	YCLR
ASCERTAIN	CID	IAC	CLT	TAKEN	Z
ASPECT	DISCUSSION	INCLLDE	CVER	TAKING	2K
ASPECTS	DC	INCLLDED	P	TECHNICUE	4K
AT	DCES	INCLLUCING	PARTICULAR	TECHNICUES	8K
ATTAIN	CCING	INCCRCRATING	PER	TEN	1CK
ATTAINED	CCNE	INCREASE	PCCR	THAN	12K
ATTEMPT	CCBLE	INCREASED	PCSSIBILITY	THAT	14K
ATTEMPTED	CCBLY	INCREASES	PCSSIBLE	THE	16K
ATTEMPTS	CCWN	INCREASING	PRACTICAL	THEIR	C
AVAILABILITY	CR	INFLUENCE	PRELIMINARY	THEM	1
AVAILABLE	DLE	INFLUENCED	PRESENCE	THEORETICAL	2
AVICING	CLRING	INFLUENCING	PRESENT	THERE	3
AWAY	E	INNER	PRIMARY	THEREFRM	4
B	EACH	INSIDE	PRINCIPLE	THERECN	5
EAC	EARLIER	INSTEAD	PRINCIPLES	THERE	6
EASED	EARLY	INTERESTING	PRCCURE	THEY	7
BASIC	EASE	INTC	PRCCURES	THIRD	8
BE	EASILY	INVCLVING	PRCGRAM	THIS	9
BECAUSE	EASY	IS	PROGRAMMING	THESE	
BEEEN					

Keyword-in-Context (KWIC) Index

TITLE	SYSTEM FILE NO.	PAGE
#ASSEMBLER LANGUAGE	1800 AS-006	003
#ASSEMBLER LANGUAGE	1800 AS-005	003
#ASSEMBLER PROGRAM	1130 SP-001	002
#ASSEMBLER PROGRAM	1130 SP-002	003
SYSTEM FAULT CURRENT#CALCULATION OF ELECTRICAL DISTRIBUTION S	1130 13.0.002	007
#GAS CHROMATOGRAPH MONITORING PROGRAM	1800 23.5.001	008
E IBM 1130, FORTRAN CODED, CRITICAL PATH #CPM/PERT FOR TH	1130 10.3.001	007
#1130 4K COGO	1130 16.2.002	008
#CCMET COMMERCIAL SUBROUTINES	1130 03.0.002	007
#IBM 1130 COMMERCIAL SUBROUTINE PACKAGE	1130 SE-25X	002
#COMET COMMERCIAL SUBROUTINES	1130 03.0.002	007
#FORTRAN COMPILER	1130 FO-001	001
#FORTRAN COMPILER	1130 FO-002	001
#FORTRAN COMPILER	1800 FO-007	004
#FCRTRAN COMPILER	1800 FO-008	004
IRECT DIGIT PROCESS CONTROL #DDC D	1800 23.5.002	008
#HEURISTIC CORRUGATOR SCHEDULING PROGRAM	1130 15.2.001	008
#PAYROLL AND LABOR COST DISTRIBUTION PACKAGE DEMONSTRATION	1130 30.1.001	008
, CRITICAL PATH #CPM/PERT FOR THE IBM 1130, FORTRAN CODED	1130 10.3.001	007
130, FORTRAN CODED, CRITICAL PATH #CPM/PERT FOR THE IBM 1	1130 10.3.001	007
BUTION SYSTEM FAULT CURRENT#CALCULATION OF ELECTRICAL DISTRI	1130 13.0.002	007
#DDC DIRECT DIGIT PROCESS CONTROL	1800 23.5.002	008
ISTRIBUTION PACKAGE DEMONSTRATION #PAYROLL AND LABOR COST D	1130 30.1.001	008
#RETAINING WALL DESIGN	1130 16.2.003	008
#DDC DIRECT DIGIT PROCESS CONTROL	1800 23.5.002	008
#DDC DIRECT DIGIT PROCESS CONTROL	1800 23.5.002	008
#DISK MONITOR PROGRAMMING SYSTEM	1130 OS-001	002
#DISK MONITOR PROGRAMMING SYSTEM	1130 OS-002	002
ROLL AND LABOR COST DISTRIBUTION PACKAGE DEMONSTRATION #PAY	1130 30.1.001	008
ATION OF ELECTRICAL DISTRIBUTION SYSTEM FAULT CURRENT#CALCUL	1130 13.0.002	007
#DRAW AND PLOT SUBROUTINES	1130 00.1.001	007
#DRAW AND PLOT SUBROUTINES	1130 00.1.002	007
#ELECTRIC POWER SYSTEM LOAD FLOW PROGRAM	1130 05.1.001	007
RENT#CALCULATION OF ELECTRICAL DISTRIBUTION SYSTEM FAULT CUR	1130 13.0.002	007
M 1800 TIME-SHARING EXECUTIVE SYSTEM /TSX-PHASE 1/ #IB	1800 OS-001	004
DISTRIBUTION SYSTEM FAULT CURRENT#CALCULATION OF ELECTRICAL	1130 13.0.002	007
C POWER SYSTEM LOAD FLOW PROGRAM #ELECTRI	1130 05.1.001	007
T FOR THE IBM 1130, FORTRAN CODED, CRITICAL PATH #CPM/PER	1130 10.3.001	007
#FORTRAN COMPILER	1130 FO-001	001
#FCRTRAN COMPILER	1130 FO-002	001
#FCRTRAN COMPILER	1800 FO-007	004
#FCRTRAN COMPILER	1800 FO-008	004
#GAS CHROMATOGRAPH MONITORING PROGRAM	1800 23.5.001	008
#HEURISTIC CORRUGATOR SCHEDULING PROGRAM	1130 15.2.001	008
#STUDENT INFORMATION SYSTEM	1130 03.0.003	007
#MULTI-LINE INTERPOLATION ROUTINE	1130 09.7.001	007
ATION #PAYROLL AND LABOR COST DISTRIBUTION PACKAGE DEMONSTR	1130 30.1.001	008
#ASSEMBLER LANGUAGE	1800 AS-005	003
#ASSEMBLER LANGUAGE	1800 AS-006	003
#SUBROUTINE LIBRARY	1130 LM-002	001
#SUBROUTINE LIBRARY	1130 LM-001	001
#SUBROUTINE LIBRARY	1800 LM-004	004
#SUBROUTINE LIBRARY	1800 LM-003	004
ELECTRIC POWER SYSTEM LOAD FLOW PROGRAM #EL	1130 05.1.001	007
#MODIFICATIONS TO THE 1130 MONITOR SYSTEM	1130 00.0.003	007
#DISK MONITOR PROGRAMMING SYSTEM	1130 OS-001	002
#DISK MONITOR PROGRAMMING SYSTEM	1130 OS-002	002
CATIONS TO THE 1130 MONITOR SYSTEM #MODIFI	1130 00.0.003	007
#GAS CHROMATOGRAPH MONITORING PROGRAM	1800 23.5.001	008
#MULTI-LINE INTERPOLATION ROUTINE	1130 09.7.001	007
IENTIFIC SUBROUTINE PACKAGE #IBM 1130 SC	1130 CM-02X	001
MMERCIAL SUBROUTINE PACKAGE #IBM 1130 CO	1130 SE-25X	002
R COST DISTRIBUTION PACKAGE DEMONSTRATION #PAYROLL AND LABO	1130 30.1.001	008
RAN CODED, CRITICAL PATH #CPM/PERT FOR THE IBM 1130, FORT	1130 10.3.001	007
AGE DEMONSTRATION #PAYROLL AND LABOR COST DISTRIBUTION PACK	1130 30.1.001	008
#PIER ANALYSIS	1130 16.2.001	008
#DRAW AND PLOT SUBROUTINES	1130 00.1.001	007
#DRAW AND PLOT SUBROUTINES	1130 00.1.002	007
#ELECTRIC POWER SYSTEM LOAD FLOW PROGRAM	1130 05.1.001	007
# SCHEDULING WITH PROBABILITY ANALYSIS	1130 10.3.001	007
#DDC DIRECT DIGIT PROCESS CONTROL	1800 23.5.002	008
#STEP-WISE MULTIPLE REGRESSION PROGRAM	1130 13.0.001	007
#RETAINING WALL DESIGN	1130 16.2.003	008
#UTILITY ROUTINES	1130 UT-001	003
#UTILITY ROUTINES	1130 UT-002	003
#UTILITY ROUTINES	1800 UT-001	005
#UTILITY ROUTINES	1800 UT-002	005
EURISTIC CORRUGATOR SCHEDULING PROGRAM #H	1130 15.2.001	008
# SCHEDULING WITH PROBABILITY ANALYSIS	1130 10.3.001	007
#IBM 1130 SCIENTIFIC SUBROUTINE PACKAGE	1130 CM-02X	001
#STEP-WISE MULTIPLE REGRESSION PROGRAM	1130 13.0.001	007
#STUDENT INFORMATION SYSTEM	1130 03.0.003	007
1/ #IBM 1800 TIME-SHARING EXECUTIVE SYSTEM /TSX-PHASE	1800 OS-001	004
#UTILITY ROUTINES	1130 UT-001	003
#UTILITY ROUTINES	1130 UT-002	003
#UTILITY ROUTINES	1800 UT-001	005
#UTILITY ROUTINES	1800 UT-002	005
#RETAINING WALL DESIGN	1130 16.2.003	008
E SYSTEM /TSX-PHASE 1/ #IBM 1800 TIME-SHARING EXECUTIV	1800 OS-001	004
#IBM 1130 COMMERCIAL SUBROUTINE PACKAGE	1130 SE-25X	002
ODIFICATIONS TO THE 1130 MONITOR SYSTEM #M	1130 00.0.003	007
#IBM 1130 SCIENTIFIC SUBROUTINE PACKAGE	1130 CM-02X	001
#1130 4K COGO	1130 16.2.002	008
PM/PERT FOR THE IBM 1130, FORTRAN CODED, CRITICAL PATH #C	1130 10.3.001	007
PHASE 1/ #IBM 1800 TIME-SHARING EXECUTIVE SYSTEM /TSX-	1800 OS-001	004

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1130-CM-02X IBM 1130 SCIENTIFIC
SUBROUTINE PACKAGE
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1130-CM-02X

SSP/1130 IS A COLLECTION OF 121 FORTRAN SUBROUTINES WHICH PROVIDE A MAJOR ADDITION TO THOSE BUILT INTO FORTRAN. THEY ARE INPUT/OUTPUT-FREE, COMPUTATIONAL BUILDING BLOCKS THAT CAN BE COMBINED WITH A USER'S INPUT, OUTPUT, OR COMPUTATIONAL ROUTINES TO MEET HIS INDIVIDUAL NEEDS. THE PACKAGE HAS WIDESPREAD APPLICATION TO THE SOLUTION OF PROBLEMS IN RESEARCH, DEVELOPMENT, AND DESIGN, IN BOTH SCIENCE AND ENGINEERING, WHEREVER FORTRAN IS USED. INDIVIDUAL SUBROUTINES, OR A COMBINATION OF THEM, CAN BE USED TO CARRY OUT THE FOLLOWING FUNCTIONS--

- IN STATISTICS -- ANALYSIS OF VARIANCE / FACTORIAL DESIGN/... CORRELATION ANALYSIS... MULTIPLE LINEAR REGRESSION... POLYNOMIAL REGRESSION... CANONICAL CORRELATION... FACTOR ANALYSIS / PRINCIPAL COMPONENTS, VARIMAX/... DISCRIMINANT ANALYSIS / MANY GROUPS/... TIME SERIES ANALYSIS... DATA SCREENING AND ANALYSIS... NON-PARAMETRIC TESTS...
- IN MATRIX MANIPULATION -- INVERSION... EIGENVALUES AND EIGENVECTORS / REAL SYMMETRIC CASE/... SIMULTANEOUS LINEAR ALGEBRAIC EQUATIONS... TRANSPOSITION... MATRIX ARITHMETIC / ADDITION, PRODUCT, ETC./... PARTITIONING... TABULATION AND SORTING OF ROWS OR COLUMNS... ELEMENTARY OPERATIONS ON ROWS OR COLUMNS.
- IN OTHER MATHEMATICAL AREAS -- INTEGRATION OF GIVEN OR TABULATED FUNCTIONS... INTEGRATION OF UP TO SIX FIRST ORDER DIFFERENTIAL EQUATIONS... FOURIER ANALYSIS OF GIVEN OR TABULATED FUNCTIONS... BESSEL AND MODIFIED BESSEL FUNCTION EVALUATION... GAMMA FUNCTION EVALUATION... LEGENDRE FUNCTION EVALUATION... ELLIPTIC, EXPONENTIAL, SINE, COSINE, FRESNEL INTEGRALS... FINDING REAL ROOTS OF A GIVEN FUNCTION... FINDING REAL AND COMPLEX ROOTS OF REAL POLYNOMIAL EQUATIONS... POLYNOMIAL ARITHMETIC / ADDITION, DIVISION, ETC./... POLYNOMIAL EVALUATION, INTEGRATION, DIFFERENTIATION.

FEATURES--

- ALL SUBROUTINES ARE FREE OF INPUT/OUTPUT STATEMENTS.
- SUBROUTINES DO NOT CONTAIN PERMANENT MAXIMUM DIMENSIONS FOR THE DATA ARRAYS NAMED IN THEIR CALLING SEQUENCES.
- ALL SUBROUTINES ARE WRITTEN IN FORTRAN.
- MANY MATRIX MANIPULATION SUBROUTINES HANDLE SYMMETRIC AND DIAGONAL MATRICES / STORED IN ECONOMICAL, COMPRESSED FORMATS/ AS WELL AS GENERAL MATRICES.
- THE USE OF IMPORTANT SUBROUTINES / OR GROUPS OF THEM/ IS ILLUSTRATED IN THE PROGRAM DOCUMENTATION BY SAMPLE MAIN PROGRAMS WITH INPUT/OUTPUT.
- ALL SUBROUTINES ARE DOCUMENTED UNIFORMLY.

AS A LIBRARY OF SUBROUTINES, SSP/1130 ALLOWS THE USER TO SELECT THOSE FUNCTIONS WHICH HE NEEDS, WHILE NOT BEING BURDENED WITH UNNEEDED ROUTINES. THE SUBROUTINES WILL COMPILE AND EXECUTE WITH THE IBM 1130 DISK MONITOR FORTRAN COMPILER /1130-CS-001/.

MACHINE CONFIGURATION-- THE MACHINE CONFIGURATION NECESSARY TO RUN SSP/1130 IS DEPENDENT UPON THE USE THAT IS TO BE MADE OF THE PACKAGE. EACH OF THE SUBROUTINES IS 1/C FREE, COMPILES TO LESS THAN 1,200 WORDS OF CORE, AND IS, THEREFORE, CONFIGURATION INDEPENDENT. HOWEVER, MANY OF THE ROUTINES ARE INTENDED TO BE USED IN CONJUNCTION WITH OTHER SUBROUTINES OR TO SOLVE PROBLEMS WITH LARGE ARRAYS OF DATA. FOR THIS REASON, MANY OF THE SUBROUTINES ARE NOT USEFUL WITH LESS THAN 8K WORDS OF CORE.

THE FOLLOWING ITEMS SHOULD BE TAKEN INTO CONSIDERATION WHEN DECIDING UPON THE APPLICABILITY OF THE PACKAGE TO A PARTICULAR MACHINE CONFIGURATION--

1. THE SIZE OF PROBLEM WHICH MAY BE EXECUTED ON A GIVEN 1130 DEPENDS UPON THE NUMBER OF SUBROUTINES USED, THE SIZE OF THE COMPILED SUBROUTINES, THE SIZE OF THE COMPILED MAIN PROGRAM, THE SIZE OF THE CONTROL PROGRAM AND THE DATA STORAGE REQUIREMENTS.
2. SSP/1130 WILL BE DISTRIBUTED IN CARD FORM ONLY.
3. THE SAMPLE PROGRAMS FOR SSP/1130 ILLUSTRATE THE SAME FUNCTIONS AS THE SSP/360 SAMPLE PROGRAMS. THREE OF THE SAMPLE PROGRAMS, CANONICAL CORRELATION, DISCRIMINANT ANALYSIS AND FACTOR ANALYSIS, USE THE OVERLAY FACILITIES OF THE 1130 DISK MONITOR PROGRAMMING SYSTEM /LOCAL/ AND THEREFORE REQUIRE A DISK SYSTEM AND 8K WORDS OF CORE. THE REMAINING SAMPLE PROGRAMS DO NOT REQUIRE DISK BUT DO REQUIRE 8K WORDS OF CORE.

BASIC PROGRAM MATERIAL --
DOCUMENTATION -- APPLICATION DIRECTORY... APPLICATION DESCRIPTION, H2C-0225... PROGRAMMERS MANUAL, H20-0252.
MACHINE READABLE -- SOURCE AND SAMPLE PROGRAM CARDS.

OPTIONAL PROGRAM MATERIAL --
SYSTEMS MANUAL CONTAINING FLOWCHARTS FOR ALL SUBROUTINES.
OPTIONAL MATERIAL MUST BE ITEMIZED ON THE ORDER CARD.

1130-F0-001 FORTRAN COMPILER
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1130-F0-001

THIS IS A CODING SYSTEM WITH A LANGUAGE THAT CLOSELY RESEMBLES THE LANGUAGE OF MATHEMATICS. IT IS A SYSTEM PRIMARILY FOR SCIENTIFIC AND ENGINEERING COMPUTATIONS. SINCE THIS SYSTEM IS ESSENTIALLY PROBLEM-ORIENTED RATHER THAN MACHINE-ORIENTED, IT PROVIDES SCIENTISTS AND ENGINEERS WITH A METHOD OF COMMUNICATIONS THAT IS MORE FAMILIAR, EASIER TO LEARN, AND EASIER TO USE THAN ACTUAL MACHINE LANGUAGE.

THE FORTRAN PROCESSOR ACCEPTS SOURCE PROGRAM STATEMENTS AS INPUT FROM CARDS OR PAPER TAPE AND PRODUCES, AS OUTPUT, A MACHINE LANGUAGE PROGRAM. AT OBJECT TIME, THE SYSTEM UTILIZES ADVANCED TECHNIQUES, SUCH AS RELOCATABLE SUBROUTINE, HIGHLY COMPRESSED PERMITS, AND FLEXIBLE INPUT AND OUTPUT COMMAND STRUCTURES WHICH FACILITATE DATA CONVERSION OPERATIONS. THE FORTRAN COMPILER PROVIDES A HIGH LEVEL OF LANGUAGE POWER AND FLEXIBILITY WITH MINIMAL MACHINE REQUIREMENTS. THE UNITS SUPPORTED AT EXECUTION TIME ARE THE 1442 CARD READ PUNCH MDL 6 OR 7, PRINTER-KEYBOARD, 1132 PRINTER, 1134 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH. A SOURCE PROGRAM WRITTEN IN THE 1130 FORTRAN LANGUAGE IS PROCESSED BY THE FORTRAN COMPILER TO PRODUCE AN 1130 MACHINE LANGUAGE PROGRAM. THE 1130 SYSTEM LOADER, INPUT/OUTPUT ROUTINES FOR 1/C FUNCTION, AND THE SYSTEM SUBPROGRAMS WILL BE LOADED WITH THE COMPILED PROGRAM PRIOR TO EXECUTION.

THE COMPILATION SPEED FOR THE SYSTEM INCLUDES THE TIME REQUIRED TO READ IN SOURCE PROGRAM, READ IN COMPILER PHASES... COMPILATION AND PUNCH CARD OBJECT DECK, ASSUMING - /1/ 40C CARD/MINUTE

CONTINUED FROM PRIOR COLUMN--
READ AND 160 CCL/PUNCH ON 1442 MDL 7, /2/ A 150 STATEMENT SOURCE PROGRAM, /3/ A 5C CARD OBJECT DECK PUNCHED, /4/ NO LISTINGS REQUIRED., THE COMPILATION WILL TAKE APPROXIMATELY 2.75 MINUTES. THIS TIME DOES NOT INCLUDE THE TIME TO PROCESS THE IBM 1130 SUBROUTINE LIBRARY. OBJECT EXECUTION SPEED IS DEPENDENT UPON PROGRAM TYPE, SIZE, 1/C FUNCTIONS PERFORMED AND OTHER FACTORS PERTINENT TO PROGRAM EXECUTION SPEED. AVAILABLE CORE VARIES WITH THE NUMBER OF SYSTEM SUBPROGRAMS AND I/O ROUTINES USED. IN GENERAL, /1/ CORE STORAGE WORDS 0000-0635 WILL BE USED BY THE 1130 SYSTEM LOADER, 500 OF WHICH MAY BE USED FOR STORING MAINLINE VARIABLES AT EXECUTION TIME AND /2/ CORE STORAGE WORDS 0636-END OF MEMORY WILL BE USED FOR THE MAINLINE PROGRAM AND ANY SUBPROGRAMS CALLED BY IT. IF THE OBJECT PROGRAM IS COMPRESSED, HOWEVER, THE SYSTEM LOADER WILL OCCUPY THE FIRST 220 WORDS OF CORE STORAGE, OF WHICH 160 MAY BE USED FOR DATA STORAGE.

MINIMUM SYSTEM REQUIREMENTS-- FOR COMPILATION -- A 4K WORD 1131 MDL 1... 1442 CARD READ PUNCH MDL 6 OR 7.

BASIC PROGRAM MATERIAL --
DOCUMENTATION -- PROGRAM MATERIAL LIST...SAMPLE FORTRAN PROGRAM DOCUMENTATION...ATTACHMENT TO USERS...OPERATORS GUIDE, C26-3629.
MACHINE READABLE -- OBJECT DECK AND SAMPLE PROGRAM.

1130-F0-002 FORTRAN COMPILER
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1130-F0-002

THIS IS A CODING SYSTEM WITH A LANGUAGE THAT CLOSELY RESEMBLES THE LANGUAGE OF MATHEMATICS. IT IS A SYSTEM PRIMARILY FOR SCIENTIFIC AND ENGINEERING COMPUTATIONS. SINCE THIS SYSTEM IS ESSENTIALLY PROBLEM-ORIENTED RATHER THAN MACHINE-ORIENTED, IT PROVIDES SCIENTISTS AND ENGINEERS WITH A METHOD OF COMMUNICATIONS THAT IS MORE FAMILIAR, EASIER TO LEARN, AND EASIER TO USE THAN ACTUAL MACHINE LANGUAGE.

THE FORTRAN PROCESSOR ACCEPTS SOURCE PROGRAM STATEMENTS AS INPUT FROM CARDS OR PAPER TAPE AND PRODUCES, AS OUTPUT, A MACHINE LANGUAGE PROGRAM. AT OBJECT TIME, THE SYSTEM UTILIZES ADVANCED TECHNIQUES, SUCH AS RELOCATABLE SUBROUTINE, HIGHLY COMPRESSED FORMATS, AND FLEXIBLE INPUT AND OUTPUT COMMAND STRUCTURES WHICH FACILITATE DATA CONVERSION OPERATIONS. THE FORTRAN COMPILER PROVIDES A HIGH LEVEL OF LANGUAGE POWER AND FLEXIBILITY WITH MINIMAL MACHINE REQUIREMENTS. THE UNITS SUPPORTED AT EXECUTION TIME ARE THE 1442 CARD READ PUNCH MDL 6 OR 7, PRINTER-KEYBOARD, 1132 PRINTER, 1134 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH. A SOURCE PROGRAM WRITTEN IN THE 1130 FORTRAN LANGUAGE IS PROCESSED BY THE FORTRAN COMPILER TO PRODUCE AN 1130 MACHINE LANGUAGE PROGRAM. THE 1130 SYSTEM LOADER, INPUT/OUTPUT ROUTINES FOR 1/C FUNCTION, AND THE SYSTEM SUBPROGRAMS WILL BE LOADED WITH THE COMPILED PROGRAM PRIOR TO EXECUTION.

THE COMPILATION SPEED FOR THE TAPE SYSTEM INCLUDES THE TIME REQUIRED TO READ AND COMPILE A SOURCE PROGRAM AT THE RATE OF 33 STATEMENTS PER MINUTE PLUS 15 MINUTES TO READ THE COMPILER PHASES. HENCE, A 150 STATEMENT SOURCE PROGRAM TAKES APPROXIMATELY 23 MINUTES TO COMPILE ASSUMING - /1/ 30 CCL/SOURCE STATEMENT, /2/ 2000 WORDS OF OBJECT PROGRAM, /3/ 60 CPS READ ON THE 1134, AND /4/ 14.8 CPS PUNCH ON THE 1055. THIS TIME DOES NOT INCLUDE THE TIME TO PROCESS THE IBM 1130 SUBROUTINE LIBRARY.

MINIMUM SYSTEM REQUIREMENTS-- FOR COMPILATION-- A 4K WORD 1131 MDL 1... 1134 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH.

BASIC PROGRAM MATERIAL --
DOCUMENTATION -- PROGRAM MATERIAL LIST...SAMPLE FORTRAN PROGRAM DOCUMENTATION...OPERATORS GUIDE.
MACHINE READABLE -- ONE PAPER TAPE FOR EACH OF THE FOLLOWING--
SAMPLE PROGRAM...COMPILER-TYPEWRITER PHASE 1...
COMPILER-TYPEWRITER PHASES 2-26...COMPILER-PRINTER PHASE 1...COMPILER-PRINTER PHASES 2-26.

1130-LM-001 SUBROUTINE LIBRARY
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1130-LM-001

THE IBM 1130 SUBROUTINE LIBRARY HAS ARITHMETIC, FUNCTIONAL, CCCC CONVERSION, 1/C CONTROL AND SELECTIVE DUMP SUBROUTINES FOR USE BY OBJECT PROGRAMS GENERATED BY THE 1130 ASSEMBLER OR THE 1130 FORTRAN COMPILER. THE FLOATING-POINT SUBROUTINES IN THE 1130 SUBROUTINE LIBRARY OFFER TWO RANGES OF PRECISION-- STANDARD RANGE AND EXTENDED RANGE. THE STANDARD RANGE PROVIDES 23 BITS OF PRECISION., THE EXTENDED RANGE PROVIDES UP TO 31 BITS OF PRECISION. THE SUBROUTINES PROVIDED INCLUDE FLOATING POINT, FIXED POINT, SPECIAL FUNCTION, CCCC CONVERSION, I/O CONTROL AND SELECTIVE DUMP. THE SUBROUTINES ARE USED BY FORTRAN COMPILER OR ASSEMBLER OBJECT PROGRAMS TO PERFORM FLOATING POINT, FIXED POINT ARITHMETIC, AND FUNCTIONAL OPERATIONS., THE CONTROL OF DATA FROM ONE I/O CODE TO ANOTHER., THE CONTROL OF I/O ACTIVITY ON THE DEVICES ATTACHED TO THE SYSTEM., AND THE SELECTIVE DUMPING OF MEMORY AREAS FOR DEBUGGING PURPOSES.

MINIMUM SYSTEM REQUIREMENTS-- A 4K WORD 1131 MDL 1... APPLICABLE I/O EQUIPMENT FOR EXECUTION OF THE SUBROUTINES. MACHINE FEATURES AND UNITS SUPPORTED-- A 4K OR 8K WORD 1131... 1442 CARD READ PUNCH MDL 6 OR 7... CONSOLE PRINTER-KEYBOARD... 2115 DISK CARTRIDGE... 1132 PRINTER... 1627 PLOTTER.

BASIC PROGRAM MATERIAL --
DOCUMENTATION -- PROGRAM MATERIAL LIST...ATTACHMENT TO USER... SUBROUTINE LIBRARY MANUAL, C26-5119.
MACHINE READABLE -- OBJECT DECK

1130-LM-002 SUBROUTINE LIBRARY
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1130-LM-002

THE IBM 1130 SUBROUTINE LIBRARY HAS ARITHMETIC, FUNCTIONAL, CCCC CONVERSION, 1/C CONTROL AND SELECTIVE DUMP SUBROUTINES FOR USE BY OBJECT PROGRAMS GENERATED BY THE 1130 ASSEMBLER OR THE 1130 FORTRAN COMPILER. THE FLOATING-POINT SUBROUTINES IN THE 1130 SUBROUTINE LIBRARY OFFER TWO RANGES OF PRECISION-- STANDARD RANGE AND EXTENDED RANGE. THE STANDARD RANGE PROVIDES UP TO 31 BITS OF PRECISION., THE EXTENDED RANGE PROVIDES UP TO 31 BITS OF PRECISION. THE SUBROUTINES PROVIDED INCLUDE FLOATING POINT, FIXED POINT, SPECIAL FUNCTION, CCCC CONVERSION, I/O CONTROL AND SELECTIVE DUMP. THE SUBROUTINES ARE USED BY FORTRAN COMPILER OR ASSEMBLER OBJECT PROGRAMS TO

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CONTINUED FROM PRIOR PAGE --
 PERFORM FLOATING POINT, FIXED POINT ARITHMETIC, AND FUNCTIONAL OPERATIONS. THE CONVERSION OF DATA FROM ONE I/O CODE TO ANOTHER, THE CONTROL OF I/O ACTIVITY ON THE DEVICES ATTACHED TO THE SYSTEM, AND THE SELECTIVE CUMULATING OF MEMORY AREAS FOR DEBUGGING PURPOSES.

MINIMUM SYSTEM REQUIREMENTS- A 4K WORD 1131 MCL 1... APPLICABLE I/O EQUIPMENT FOR EXECUTION OF THE SUBROUTINES.

MACHINE FEATURES AND UNITS SUPPORTED- A 4K OR 8K WORD 1131... 1114 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH... CONSOLE PRINTER-KEYBOARD... 2315 DISK CARTRIDGE... 1132 PRINTER... 1627 PLOTTER.

BASIC PROGRAM MATERIAL -
 DOCUMENTATION - PROGRAM MATERIAL LIST... SUBROUTINE LIBRARY MANUAL, 646-5929.
 MACHINE READABLE - ONE PAPER TAPE FOR EACH OF THE FOLLOWING- 145, 115 AND CONVERSION SUBROUTINES... ARITHMETIC, FUNCTIONAL, AND FORTRAN I/O SUBROUTINES- STANDARD PACKAGE... ARITHMETIC, FUNCTIONAL, AND FORTRAN I/O SUBROUTINES - EXTENDED PACKAGE.

1130-CS-001 DISK MONITOR PROGRAMMING SYSTEM

ORDER THROUGH LOCAL IBM BRANCH OFFICE
 SPECIFY FILE NUMBER 1130-CS-001

THE MONITOR SYSTEM IS A DISK-ORIENTED SYSTEM ALLOWING THE USER TO ASSEMBLE, COMPILER, AND/OR EXECUTE INDIVIDUAL OR SEVERAL PROGRAMS WITH A MINIMUM OF OPERATOR INTERVENTION. JOBS TO BE PERFORMED ARE STACKED AND SEPARATED BY CONTROL RECORDS THAT IDENTIFY THE JOBS. THE MONITOR SYSTEM ALSO PROVIDES THE FLEXIBILITY TO PROGRAM FOR THE DIVERSE APPLICATIONS OF GENERAL ENGINEERING.

THE 1130 MONITOR SYSTEM IS COMPRISED OF FIVE SEPARATE PROGRAMS-
 - SUPERVISOR.
 - SUBROUTINE LIBRARY.
 - DISK UTILITY.
 - ASSEMBLER.
 - FORTRAN COMPILER.

JOB RECORDS IDENTIFY JOBS TO BE PERFORMED BY THE 1130 MONITOR SYSTEM.

- SUPERVISOR CONTROL RECORDS SPECIFY THE FUNCTIONS TO BE PERFORMED, E.G., ASSEMBLY, FORTRAN COMPILATION, EXECUTE AN ASSEMBLED OR COMPILED PROGRAM, CALL THE DISK UTILITY PROGRAM. CONTROL RECORDS RECOGNIZED BY THE FUNCTION TO BE PERFORMED GIVE FURTHER INSTRUCTIONS REGARDING THE JOB, SUCH AS LIST DECK, LIST, PRINT SYMBOL TABLE, DUMP, STORE, DUMP LET, ETC.
 - THE SUBROUTINE LIBRARY I/O PROGRAMS CAN BE CALLED BY THE USER TO ACCOMPLISH THE INPUTTING AND OUTPUTTING OF DATA FROM AND TO THE ATTACHED PERIPHERAL DEVICES.
 - THE DISK UTILITY PROGRAM PROVIDES THE USER WITH A USEFUL TOOL FOR EASILY STORING DATA AND PROGRAMS ON THE DISK UNIT AND QUICKLY RETRIEVING AND USING THE INFORMATION.
 - THE ASSEMBLER PERMITS THE PROGRAMMER TO CODE A PROBLEM IN A LANGUAGE THAT IS MORE MEANINGFUL AND EASIER TO HANDLE THAN THE ACTUAL MACHINE LANGUAGE.
 - THE FORTRAN COMPILER PERMITS THE USER TO UTILIZE THE 1130 SYSTEM FOR SOLVING PROBLEMS WITH ONLY A SLIGHT KNOWLEDGE OF THE SYSTEM AND A SHORT PERIOD OF INSTRUCTION.

THE FORTRAN COMPILER SPEEDS FOR A 150 CARD SOURCE PROGRAM ARE APPROXIMATELY 3-8 MINUTES WITH LISTING, 1.8 MINUTES WITHOUT LISTING AND 7-2 MINUTES WITH A CONSOLE PRINTER LISTING ASSUMING A 1442 MODEL 6 OR 7 CARD READER PUNCH. FORTRAN OBJECT PROGRAM EXECUTION SPEED IS DEPENDENT UPON PROGRAM TYPE, SIZE, I/O FUNCTIONS PERFORMED, AND OTHER FACTORS PERTINENT TO PROGRAM EXECUTION SPEED.
 THE ASSEMBLER PROGRAM SPEEDS FOR CARD INPUT WITH 1442 MODEL 7 INPUT ARE- 320 CARDS/MIN. WITH NO LISTING, 64 CARDS/MIN. WITH 1132 LISTING, AND 17 CARDS/MIN. WITH CONSOLE PRINTER LISTING. CORRESPONDING SPEEDS FOR 1442 MCL 6 INPUT ARE 250, 60 AND 17 CARDS PER MIN. RESPECTIVELY.

MINIMUM SYSTEM REQUIREMENTS- A 4K WORD 1131 MODEL 2... 1442 CARD READ PUNCH MCL 6 OR 7.

BASIC PROGRAM MATERIAL -
 DOCUMENTATION - PROGRAM MATERIAL LIST... ATTACHMENT TO USERS... MONITOR REFERENCE MANUAL, C26-3750.
 MACHINE READABLE - OBJECT DECKS AND SAMPLE PROBLEMS.

1130-CS-002 DISK MONITOR PROGRAMMING SYSTEM

ORDER THROUGH LOCAL IBM BRANCH OFFICE
 SPECIFY FILE NUMBER 1130-CS-002

THE MONITOR SYSTEM IS A DISK-ORIENTED SYSTEM ALLOWING THE USER TO ASSEMBLE, COMPILER, AND/OR EXECUTE INDIVIDUAL OR SEVERAL PROGRAMS WITH A MINIMUM OF OPERATOR INTERVENTION. JOBS TO BE PERFORMED ARE STACKED AND SEPARATED BY CONTROL RECORDS THAT IDENTIFY THE JOBS. THE MONITOR SYSTEM ALSO PROVIDES THE FLEXIBILITY TO PROGRAM FOR THE DIVERSE APPLICATIONS OF GENERAL ENGINEERING.

THE 1130 MONITOR SYSTEM IS COMPRISED OF FIVE SEPARATE PROGRAMS-
 - SUPERVISOR.
 - SUBROUTINE LIBRARY.
 - DISK UTILITY.
 - ASSEMBLER.
 - FORTRAN COMPILER.

JOB RECORDS IDENTIFY JOBS TO BE PERFORMED BY THE 1130 MONITOR SYSTEM.

- SUPERVISOR CONTROL RECORDS SPECIFY THE FUNCTIONS TO BE PERFORMED, E.G., ASSEMBLY, FORTRAN COMPILATION, EXECUTE AN ASSEMBLED OR COMPILED PROGRAM, CALL THE DISK UTILITY PROGRAM. CONTROL RECORDS RECOGNIZED BY THE FUNCTION TO BE PERFORMED GIVE FURTHER INSTRUCTIONS REGARDING THE JOB, SUCH AS LIST DECK, LIST, PRINT SYMBOL TABLE, DUMP, STORE, DUMP LET, ETC.
 - THE SUBROUTINE LIBRARY I/O PROGRAMS CAN BE CALLED BY THE USER TO ACCOMPLISH THE INPUTTING AND OUTPUTTING OF DATA FROM AND TO THE ATTACHED PERIPHERAL DEVICES.
 - THE DISK UTILITY PROGRAM PROVIDES THE USER WITH A USEFUL TOOL FOR EASILY STORING DATA AND PROGRAMS ON THE DISK UNIT AND QUICKLY RETRIEVING AND USING THE INFORMATION.
 - THE ASSEMBLER PERMITS THE PROGRAMMER TO CODE A PROBLEM IN A LANGUAGE THAT IS MORE MEANINGFUL AND EASIER TO HANDLE THAN THE ACTUAL MACHINE LANGUAGE.
 - THE FORTRAN COMPILER PERMITS THE USER TO UTILIZE THE 1130 SYSTEM FOR SOLVING PROBLEMS WITH ONLY A SLIGHT

CONTINUED FROM PRIOR COLUMN--

KNOWLEDGE OF THE SYSTEM AND A SHORT PERIOD OF INSTRUCTION. THE FORTRAN COMPILER SPEEDS FOR A 150 SOURCE STATEMENT PROGRAM ARE APPROXIMATELY 3-8 MINUTES WITH LISTING, 2-5 MINUTES WITHOUT LISTING AND 7-2 MINUTES WITH A CONSOLE PRINTER LISTING ASSUMING AN 1134 READER AND 1055 PUNCH. FORTRAN OBJECT PROGRAM EXECUTION SPEED IS DEPENDENT UPON PROGRAM TYPE, SIZE, I/O FUNCTIONS PERFORMED, AND OTHER FACTORS PERTINENT TO PROGRAM EXECUTION SPEED.
 THE ASSEMBLER PROGRAM SPEEDS FOR PAPER TAPE INPUT WITH 1134 READER INPUT ARE- 120 STATEMENTS/MIN. WITH NO LISTING, 44 STATEMENTS/MIN. WITH 1050 LISTING, AND 16 STATEMENTS/MIN. WITH CONSOLE PRINTER LISTING.

MINIMUM SYSTEM REQUIREMENTS- A 4K WORD 1131 MODEL 2... 1134 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH.

BASIC PROGRAM MATERIAL -
 DOCUMENTATION - PROGRAM MATERIAL LIST... MONITOR REFERENCE MANUAL, C26-3750.
 MACHINE READABLE - ONE PAPER TAPE FOR EACH OF THE FOLLOWING- SYSTEM LOADER - PART 1... LOAD MODE CONTROL RECORD... SYSTEM LOADER - PART 2... SYSTEM CONFIGURATION... SUPERVISOR AND LOADER... DISK UTILITY PROGRAMS... FORTRAN COMPILER... ASSEMBLER... SUBROUTINE LIBRARY... COLD START TAPE RECORD... DPCR... 1132 CORE DUMP... CONSOLE PRINTER DUMP... SAMPLE FORTRAN PROGRAM... SAMPLE ASSEMBLY PROGRAM.

1130-SE-25X IBM 1130 COMMERCIAL SUBROUTINE PACKAGE

ORDER THROUGH LOCAL IBM BRANCH OFFICE
 SPECIFY FILE NUMBER 1130-SE-25X

THE 1130 COMMERCIAL SUBROUTINE PACKAGE PROVIDES THE SCIENTIFIC USER WITH ADDED CAPABILITIES FOR HANDLING FUNCTIONS AND TECHNIQUES COMMON TO COMMERCIAL PROGRAMMING. THIS SET OF EIGHT SUBROUTINES ARE CALLABLE BY THE FORTRAN PROGRAMMER IN A SIMILAR MANNER TO SUCH STANDARD FUNCTIONS AS SINE, COSINE, SQUARE ROOT, ETC. THESE FORTRAN WRITTEN SUBROUTINES /ONE IS IN ASSEMBLER LANGUAGE/ ARE INDEPENDENT OF INPUT AND OUTPUT. THEY WILL PROVIDE THE SCIENTIFIC 1130 USER WITH FLEXIBILITY TO ADD LIMITED COMMERCIAL APPLICATIONS SUCH AS PAYROLL, COST ACCOUNTING, AND MANY OTHERS. FEATURES ARE-

- VARIABLE LENGTH ALPHAMERIC MOVE.
 - VARIABLE LENGTH ALPHAMERIC COMPARE.
 - VARIABLE LENGTH CONVERSION FROM EBCDIC TO FLOATING-POINT.
 - VARIABLE LENGTH CONVERSION FROM FLOATING-POINT TO EBCDIC.
 - ZONE MANIPULATION.
 - FILL AN AREA WITH A SPECIFIED CHARACTER.
 - STACKER SELECT.
 STACKER SELECT IS PROGRAMMED IN 1130 ASSEMBLER LANGUAGE, ALL OTHER ROUTINES ARE PROGRAMMED IN 1130 FORTRAN. THE INTERNAL FORMAT OF DATA IS ONE CHARACTER PER WORD.

MINIMUM SYSTEM REQUIREMENTS- FOR EXECUTION - AN 1131 MODEL 18 OR 2B... 1442 CARD READ PUNCH MODEL 6 OR 7. IN ADDITION, THE CONSOLE PRINTER, 1134 PAPER TAPE READER, 1055 PAPER TAPE PUNCH AND 1132 PRINTER ARE SUPPORTED. FOR COMPILATION AND ASSEMBLY ONLY, THE MINIMUM 1130 FORTRAN CARD SYSTEM REQUIREMENTS ARE SUFFICIENT.

BASIC PROGRAM MATERIAL -
 DOCUMENTATION - APPLICATION DIRECTORY... APPLICATION DESCRIPTION, H20-0221... REFERENCE MANUAL /INCLUDING OPERATING INSTRUCTIONS, LISTINGS, FLOW CHARTS AND NARRATIVE/, H20-0241.
 MACHINE READABLE - SOURCE AND SAMPLE PROBLEM DECKS.

1130-SP-001 ASSEMBLER PROGRAM

ORDER THROUGH LOCAL IBM BRANCH OFFICE
 SPECIFY FILE NUMBER 1130-SP-001

THE IBM 1130 ASSEMBLER PROVIDES THE PROGRAMMER A FLEXIBLE AND MEANINGFUL SYMBOLIC LANGUAGE THAT IS EASIER TO CODE THAN A BINARY MACHINE LANGUAGE. SOURCE PROGRAMS ARE ASSEMBLED BY THE PROCESSOR IN TWO PASSES. THE ASSEMBLER AUTOMATICALLY ASSIGNS AND KEEPS A RECORD OF STORAGE LOCATIONS AND CHECKS FOR CODING ERRORS. BY RELIEVING THE PROGRAMMER OF THESE BURDENSOME TASKS, THE ASSEMBLER SIGNIFICANTLY REDUCES THE AMOUNT OF PROGRAMMING TIME AND EFFORT REQUIRED TO PREPARE A PROGRAM. A COMPRESSOR PROGRAM COMPRESSES SYMBOLICALLY ASSEMBLED OUTPUT INTO A FORM SUITABLE FOR EXECUTION. THE ASSEMBLER AND ITS COMPRESSOR ALWAYS USE ALL OF CORE STORAGE AVAILABLE ON AN ASSEMBLY MACHINE. THE PROGRAMS DETERMINE MEMORY SIZE AUTOMATICALLY AT ASSEMBLY TIME AND ADJUST TABLE PARAMETERS ACCORDINGLY. APPROXIMATELY 520 LABELS MAY BE HELD IN A 4K MEMORY. THE ASSEMBLER PROVIDES FOR ASSEMBLY OF BOTH ABSOLUTE AND RELOCATABLE MAINLINE PROGRAMS, AND FOR ASSEMBLY OF RELOCATABLE SUBROUTINES. BY MEANS OF ENT AND CALL STATEMENTS, PROVISION IS MADE FOR AUTOMATIC SYMBOLIC CROSS-REFERENCING BETWEEN PROGRAMS AT LOAD TIME. THE ASSEMBLER CAN BE USED TO GENERATE SUBROUTINES AND SUBPROGRAMS FOR FORTRAN MAIN PROGRAMS. SIMILARLY, ASSEMBLER MAIN PROGRAMS CAN CALL FORTRAN SUBROUTINES OR SUBPROGRAMS, AS WELL AS SUBROUTINE LIBRARY AND UTILITY ROUTINES. THE ASSEMBLER ALSO PROVIDES FACILITIES FOR ASSEMBLING INTERRUPT PROCESSING SUBROUTINES WHICH MAY BE INCORPORATED INTO THE SYSTEM. AT OBJECT TIME, THE RELOCATING LOADER NORMALLY OCCUPIES CORE STORAGE LOCATIONS THROUGH 0639. INSTRUCTIONS AND DATA MAY NOT BE LOADED INTO THIS AREA, HOWEVER, MOST OF THIS AREA MAY BE USED AS INPUT/OUTPUT BUFFERS AND WORKING STORAGE. A CORE IMAGE CONVERTER IS PROVIDED WHICH WILL CONVERT THE RELOCATABLE BINARY OBJECT DECKS OF A MAINLINE AND ALL CALLED SUBROUTINES, INTO A SINGLE CORE IMAGE BINARY DECK. THIS DECK MAY THEN BE LOADED WITH A CORE IMAGE LOADER WHICH HAS NO RELOCATING OR CROSS-REFERENCING ABILITY. THIS LOADER WILL OCCUPY /APPROXIMATELY/ CORE LOCATIONS 0000 THROUGH 0220. MUCH OF THIS AREA MAY BE USED AS INPUT/OUTPUT BUFFERS AND WORKING STORAGE. THE ASSEMBLY SPEEDS FOR THE ASSEMBLERS AND COMPRESSORS ARE LIMITED BY THE SPEED OF THE I/O DEVICES, ALTHOUGH FOR EXTREMELY LARGE PROGRAMS WITH MANY LABELS /E.G., A 700 LABEL PROGRAM BEING ASSEMBLED ON AN 8K MACHINE/, A SLIGHT REDUCTION MAY BE EXPECTED IN THE SPEED ON THE ORDER OF 10 PER CENT.

THROUGHPUT SPEED FOR ASSEMBLY AND COMPRESSION /NOT COUNTING PROCESSOR LOAD TIME/ --

- 1442 MODEL 6 -- 67-77 STATEMENTS/MINUTE /THIS VARIATION MAY BE ASCRIBED TO VARYING NUMBERS OF COMMENTS STATEMENTS WHICH DO NOT REQUIRE PUNCHING./
 - 1442 MODEL 7 -- 90-100 STATEMENTS/MINUTE
 - PROCESSOR LOAD TIMES ARE AS FOLLOWS --
 WITH 1442 MCL 6, ASSEMBLER-12 SECONDS, COMPRESSOR-9 SECONDS
 WITH 1442 MCL 7, ASSEMBLER-9 SECONDS, COMPRESSOR-7 SECONDS

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MINIMUM SYSTEM REQUIREMENTS- FOR PROGRAM GENERATION AND EXECUTION -- A 4K WORD 1131 MDL 1... 1442 CARD READ PUNCH MDL 6 OR 7.

BASIC PROGRAM MATERIAL -
DOCUMENTATION - PROGRAM MATERIAL LIST...OPERATORS GUIDE
C26-3629...ATTACHMENT TO USERS...SAMPLE ASSEMBLY DOCUMENTATION
MACHINE READABLE - OBJECT DECK AND SAMPLE PROGRAM.

1130-SP-002 ASSEMBLER PROGRAM
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1130-SP-002

THE IBM 1130 ASSEMBLER PROVIDES THE PROGRAMMER A FLEXIBLE AND MEANINGFUL SYMBOLIC LANGUAGE THAT IS EASIER TO CODE THAN A BINARY MACHINE LANGUAGE. SOURCE PROGRAMS ARE ASSEMBLED BY THE PROCESSOR IN TWO PASSES. THE ASSEMBLER AUTOMATICALLY ASSIGNS AND KEEPS A RECORD OF STORAGE LOCATIONS AND CHECKS FOR CODING ERRORS. BY RELIEVING THE PROGRAMMER OF THESE BURDENSOME TASKS, THE ASSEMBLER SIGNIFICANTLY REDUCES THE AMOUNT OF PROGRAMMING TIME AND EFFORT REQUIRED TO PREPARE A PROGRAM. A COMPRESSOR PROGRAM COMPRESSES SYMBOLICALLY ASSEMBLED OUTPUT INTO A FORM SUITABLE FOR EXECUTION. THE ASSEMBLER AND ITS COMPRESSOR ALWAYS USE ALL OF CORE STORAGE AVAILABLE ON AN ASSEMBLY MACHINE. THE PROGRAMS DETERMINE MEMORY SIZE AUTOMATICALLY AT ASSEMBLY TIME AND ADJUST TABLE PARAMETERS ACCORDINGLY. APPROXIMATELY 520 LABELS MAY BE HELD IN A 4K MEMORY. THE ASSEMBLER PROVIDES FOR ASSEMBLY OF BOTH ABSOLUTE AND RELOCATABLE MAINLINE PROGRAMS, AND FOR ASSEMBLY OF RELOCATABLE SUBROUTINES. BY MEANS OF ENT AND CALL STATEMENTS, PROVISION IS MADE FOR AUTOMATIC SYMBOLIC CROSS-REFERENCING BETWEEN PROGRAMS AT LOAD TIME. THE ASSEMBLER CAN BE USED TO GENERATE SUBROUTINES AND SUBPROGRAMS FOR FORTRAN, SIMILARLY, ASSEMBLER MAIN PROGRAMS CAN CALL FORTRAN SUBROUTINES OR SUBPROGRAMS, AS WELL AS SUBROUTINE LIBRARY AND UTILITY ROUTINES. THE ASSEMBLER ALSO PROVIDES FACILITIES FOR ASSEMBLING INTERRUPT PROCESSING SUBROUTINES WHICH MAY BE INCORPORATED INTO THE SYSTEM. AT OBJECT TIME, THE RELOCATING LOADER NORMALLY OCCUPIES CORE STORAGE LOCATIONS 0000 THROUGH 0635. INSTRUCTIONS AND DATA MAY NOT BE LOADED IN THIS AREA, HOWEVER, MOST OF THIS AREA MAY BE USED AS INPUT/OUTPUT BUFFERS AND WORKING STORAGE. A CORE IMAGE CONVERTER IS PROVIDED WHICH WILL CONVERT THE RELOCATABLE BINARY OBJECT DECKS OF A MAINLINE AND ALL CALLED SUBROUTINES, INTO A SINGLE CORE IMAGE BINARY DECK. THIS DECK MAY THEN BE LOADED WITH A CORE IMAGE LOADER WHICH HAS NO RELOCATING OR CROSS-REFERENCING ABILITIES. THIS LOADER WILL OCCUPY /APPROXIMATELY/ CORE LOCATIONS 0000 THROUGH 0220. MUCH OF THIS AREA MAY BE USED AS INPUT/OUTPUT BUFFERS AND WORKING STORAGE. THE ASSEMBLY SPEEDS FOR THE ASSEMBLERS AND COMPRESSORS ARE LIMITED BY THE SPEED OF THE I/O DEVICES, ALTHOUGH FOR EXTREMELY LARGE PROGRAMS WITH MANY LABELS /E.G., A 700 LABEL PROGRAM BEING ASSEMBLED ON AN 8K MACHINE/, A SLIGHT REDUCTION MAY BE EXPECTED IN THE SPEED ON THE ORDER OF 10 PER CENT.

THROUGHPUT SPEED- PAPER TAPE SYSTEM WITH 1134 AND 1055 -- 6-17 STATEMENTS/MINUTE
THE VARIATION MAY BE ASCRIBED TO --
A. THE EXTENT OF REMARKS ON THE STATEMENTS, WHICH AFFECT THE TAPE LENGTH AND HENCE THE READ/PUNCH TIME, AND
B. WHETHER OR NOT THE OPTIONAL TYPEWRITER LISTING IS REQUESTED DURING THE COMPRESSION. THIS LISTING EFFECTIVELY REDUCES THE READ SPEED TO 15 CHARACTERS/SECOND, THE TYPEWRITER SPEED.

MINIMUM SYSTEM REQUIREMENTS- FOR PROGRAM GENERATION AND EXECUTION- A 4K WORD 1131 MDL 1... 1134 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH.

BASIC PROGRAM MATERIAL -
DOCUMENTATION - PROGRAM MATERIAL LIST...OPERATORS GUIDE
C26-3629...SAMPLE ASSEMBLY DOCUMENTATION.
MACHINE READABLE - ONE PAPER TAPE FOR EACH OF THE FOLLOWING-
SAMPLE PROGRAM...ASSEMBLER...COMPRESSOR.

1130-UT-001 UTILITY ROUTINES
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1130-UT-001

THE IBM 1130 UTILITY ROUTINES ARE PART OF THE BASIC PROGRAMMING SYSTEM TO BE USED BY ALL 1130 INSTALLATIONS. THESE PROGRAMS MAKE IT POSSIBLE TO PROGRAM THE 1130 IN A WIDE RANGE OF GENERAL ENGINEERING APPLICATIONS. THE UTILITY ROUTINES INCLUDE-
/1/ AN INPUT/OUTPUT ROUTINE WHICH ACCEPTS DATA FROM ONE OF TWO INPUT MEDIA /CARD OR PAPER TAPE/ AND OUTPUTS DATA TO ONE OR TWO OF FOUR OUTPUT DEVICES /CARD, PAPER TAPE, 1132 OR CONSOLE PRINTER/. WHEN TWO OUTPUT DEVICES ARE REQUIRED, ONE MUST BE A PRINT OPTION /CONSOLE PRINTER OR 1132 PRINTER/. /2/ DUMP ROUTINES WHICH PERMIT THE USER TO DUMP ANY AREA OF MEMORY.. OUTPUT CAN BE OBTAINED ON CARDS, CONSOLE PRINTER OR 1132 PRINTER. /3/ LOADER ROUTINES - RELOCATING LOADER, CORE IMAGE CONVERTER, AND CORE IMAGE LOADER. THESE ROUTINES PROVIDE THE PROGRAMMER WITH A VERSATILE TOOL FOR TRANSFERRING DATA FROM ONE MEDIUM TO ANOTHER, AND ALSO FOR PERFORMING THE REPETITIVE UTILITY FUNCTIONS NEEDED DAILY FOR MOST DATA PROCESSING INSTALLATIONS. THEY ALSO INCLUDE ROUTINES TO AID THE USER IN DEBUGGING HIS PROGRAMS. IN ADDITION, THEY PROVIDE THE FACILITIES FOR- /1/ LOADING COMPRESSED BINARY OBJECT PROGRAM CARDS IN EITHER RELOCATABLE OR CORE IMAGE FORMAT, /2/ GENERATING OBJECT PROGRAM CORE MAPS.

MINIMUM SYSTEM REQUIREMENTS- A 4K WORD 1131 MDL 1... 1442 CARD READ PUNCH MDL 6 OR 7.
BASIC PROGRAM MATERIAL -
DOCUMENTATION - PROGRAM MATERIAL LIST...ATTACHMENT TO USER...
OPERATORS GUIDE, C26-3629.
MACHINE READABLE - OBJECT DECK.

1130-UT-002 UTILITY ROUTINES
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1130-UT-002

THE IBM 1130 UTILITY ROUTINES ARE PART OF THE BASIC PROGRAMMING SYSTEM TO BE USED BY ALL 1130 INSTALLATIONS. THESE PROGRAMS MAKE IT POSSIBLE TO PROGRAM THE 1130 IN A WIDE RANGE OF GENERAL ENGINEERING APPLICATIONS. THE UTILITY ROUTINES INCLUDE-
/1/ AN INPUT/OUTPUT ROUTINE WHICH ACCEPTS DATA FROM ONE OF TWO INPUT MEDIA /CARD OR PAPER TAPE/ AND OUTPUTS DATA TO ONE OR TWO OF FOUR OUTPUT DEVICES /CARD, PAPER TAPE, 1132 OR CONSOLE PRINTER/. WHEN TWO OUTPUT DEVICES ARE REQUIRED, ONE MUST BE A

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PRINT OPTION /CONSOLE PRINTER OR 1132 PRINTER/. /2/ DUMP ROUTINES WHICH PERMIT THE USER TO DUMP ANY AREA OF MEMORY.. OUTPUT CAN BE OBTAINED ON CARDS, CONSOLE PRINTER OR 1132 PRINTER. /3/ LOADER ROUTINES - RELOCATING LOADER, CORE IMAGE CONVERTER, AND CORE IMAGE LOADER. THESE ROUTINES PROVIDE THE PROGRAMMER WITH A VERSATILE TOOL FOR TRANSFERRING DATA FROM ONE MEDIUM TO ANOTHER, AND ALSO FOR PERFORMING THE REPETITIVE UTILITY FUNCTIONS NEEDED DAILY FOR MOST DATA PROCESSING INSTALLATIONS. THEY ALSO INCLUDE ROUTINES TO AID THE USER IN DEBUGGING HIS PROGRAMS. IN ADDITION, THEY PROVIDE THE FACILITIES FOR- /1/ LOADING COMPRESSED BINARY OBJECT PROGRAM CARDS IN EITHER RELOCATABLE OR CORE IMAGE FORMAT, /2/ GENERATING OBJECT PROGRAM CORE MAPS.

MINIMUM SYSTEM REQUIREMENTS- A 4K WORD 1131 MDL 1... 1134 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH.

BASIC PROGRAM MATERIAL -
DOCUMENTATION - PROGRAM MATERIAL LIST...OPERATORS GUIDE,
C26-3629.
MACHINE READABLE - ONE PAPER TAPE FOR EACH OF THE FOLLOWING-
RELOCATING LOADER...CORE IMAGE LOADER...CORE IMAGE
CONVERTER-CORE MAP ON TYPEWRITER...CORE IMAGE CONVERTER-
CORE MAP ON PRINTER...DUMP AND CONSOLE UTILITIES...
I/O UTILITIES...CONSTRUCT PAPER TAPE - A ROUTINE FOR
COMPRESSING SUBROUTINES...EOD 1...EOD 2...OPIR...USER
EXIT SPECIAL USER EOD...USER EXIT OVERLAY RECORD...
ONE RECORD TYPEWRITER DUMP...KEYBOARD ROUTINE.

1800

1800-AS-005 ASSEMBLER LANGUAGE
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1800-AS-005

THE IBM 1800 ASSEMBLER LANGUAGE PROVIDES THE PROGRAMMER A FLEXIBLE AND MEANINGFUL SYMBOLIC LANGUAGE THAT IS EASIER TO CODE THAN A BINARY MACHINE LANGUAGE. SOURCE PROGRAMS ARE ASSEMBLED BY THE PROCESSOR IN TWO PASSES. THE ASSEMBLER AUTOMATICALLY ASSIGNS AND KEEPS A RECORD OF STORAGE LOCATIONS AND CHECKS FOR CODING ERRORS. BY RELIEVING THE PROGRAMMER OF THESE BURDENSOME TASKS, THE ASSEMBLER REDUCES SIGNIFICANTLY THE AMOUNT OF PROGRAMMING TIME AND EFFORT REQUIRED TO PREPARE A PROGRAM. A COMPRESSOR PROGRAM IS PROVIDED WITH THE ASSEMBLER TO COMPRESS SYMBOLICALLY ASSEMBLED OUTPUT INTO A FORM SUITABLE FOR EXECUTION. THE ASSEMBLER AND ITS COMPRESSOR ALWAYS USE ALL CORE STORAGE AVAILABLE ON AN ASSEMBLY MACHINE. THE PROGRAMS DETERMINE MEMORY SIZE AUTOMATICALLY AT ASSEMBLY TIME AND ADJUST TABLE PARAMETERS ACCORDINGLY. THE ASSEMBLER PROVIDES FOR ASSEMBLY OF BOTH ABSOLUTE AND RELOCATABLE MAINLINE PROGRAMS, AND FOR ASSEMBLY OF RELOCATABLE SUBROUTINES. BY MEANS OF ENT AND CALL STATEMENTS, PROVISION IS MADE FOR AUTOMATIC SYMBOLIC CROSS-REFERENCING BETWEEN PROGRAMS AT LOAD TIME. THE ASSEMBLER MAY BE USED TO GENERATE SUBROUTINES AND SUBPROGRAMS FOR FORTRAN MAIN PROGRAMS. SIMILARLY, ASSEMBLER MAIN PROGRAMS MAY CALL FORTRAN SUBROUTINES OR SUBPROGRAMS, AS WELL AS SUBROUTINE LIBRARY AND UTILITY ROUTINES. A CORE IMAGE CONVERTER IS PROVIDED WHICH WILL CONVERT THE RELOCATABLE BINARY OBJECT TAPE OF A MAINLINE AND ALL CALLED SUBROUTINES INTO A SINGLE CORE IMAGE BINARY TAPE. THIS TAPE MAY THEN BE LOADED WITH A CORE IMAGE LOADER WHICH HAS NO RELOCATING OR CROSS-REFERENCING ABILITIES. THE ASSEMBLY AND COMPRESSION RATE WILL VARY WITH THE NUMBER OF CHARACTERS PER STATEMENT IN THE PROGRAM. IN GENERAL, THE TOTAL PROCESSING TIME WILL BE PROPORTIONAL TO THE TOTAL NUMBER OF CHARACTERS IN THAT INPUT PROGRAM, PLUS THE ASSEMBLER OR COMPRESSOR LOAD TIME.
- THE ASSEMBLER LOAD TIME IS 5.5 MINUTES.
- THE COMPRESSOR LOAD TIME IS 3.7 MINUTES.
FOR COMPRESSING ALL BUT VERY SMALL PROGRAMS, THE COMPRESSION RATE WILL BE ABOUT 16 STATEMENTS/MINUTE /FIGURED ON STATEMENT SIZE OF ABOUT 26 CHARACTERS/. FOR VERY SMALL SUBROUTINES, THE RATE WILL BE SOMEWHAT LOWER DUE TO THE EXTRA TIME REQUIRED TO PUNCH THE LOADER OVERLAY RECORDS.
THE 1055 READER IS 15 CHARACTERS/SECOND AND THE 1055 PUNCHES 15 CHARACTERS/SECOND.

MINIMUM SYSTEM REQUIREMENTS- FOR PROGRAM GENERATION AND EXECUTION -- A 4,096 WORD 1800 SYSTEM PROCESSOR-CONTROLLER... 1442 CARD READ PUNCH MODEL 6 OR 7 AND ENGINEERING CHANGE LEVEL 415164.

BASIC PROGRAM MATERIAL -
DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS GUIDE C26-3751.
MACHINE READABLE - ASSEMBLER DECK... COMPRESSOR DECK...
SAMPLE PROGRAM.

1800-AS-006 ASSEMBLER LANGUAGE
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1800-AS-006

THE IBM 1800 ASSEMBLER LANGUAGE PROVIDES THE PROGRAMMER A FLEXIBLE AND MEANINGFUL SYMBOLIC LANGUAGE THAT IS EASIER TO CODE THAN A BINARY MACHINE LANGUAGE. SOURCE PROGRAMS ARE ASSEMBLED BY THE PROCESSOR IN TWO PASSES. THE ASSEMBLER AUTOMATICALLY ASSIGNS AND KEEPS A RECORD OF STORAGE LOCATIONS AND CHECKS FOR CODING ERRORS. BY RELIEVING THE PROGRAMMER OF THESE BURDENSOME TASKS, THE ASSEMBLER REDUCES SIGNIFICANTLY THE AMOUNT OF PROGRAMMING TIME AND EFFORT REQUIRED TO PREPARE A PROGRAM. A COMPRESSOR PROGRAM IS PROVIDED WITH THE ASSEMBLER TO COMPRESS SYMBOLICALLY ASSEMBLED OUTPUT INTO A FORM SUITABLE FOR EXECUTION. THE ASSEMBLER AND ITS COMPRESSOR ALWAYS USE ALL CORE STORAGE AVAILABLE ON AN ASSEMBLY MACHINE. THE PROGRAMS DETERMINE MEMORY SIZE AUTOMATICALLY AT ASSEMBLY TIME AND ADJUST TABLE PARAMETERS ACCORDINGLY. THE ASSEMBLER PROVIDES FOR ASSEMBLY OF BOTH ABSOLUTE AND RELOCATABLE MAINLINE PROGRAMS, AND FOR ASSEMBLY OF RELOCATABLE SUBROUTINES. BY MEANS OF ENT AND CALL STATEMENTS, PROVISION IS MADE FOR AUTOMATIC SYMBOLIC CROSS-REFERENCING BETWEEN PROGRAMS AT LOAD TIME. THE ASSEMBLER MAY BE USED TO GENERATE SUBROUTINES AND SUBPROGRAMS FOR FORTRAN MAIN PROGRAMS. SIMILARLY, ASSEMBLER MAIN PROGRAMS MAY CALL FORTRAN SUBROUTINES OR SUBPROGRAMS, AS WELL AS SUBROUTINE LIBRARY AND UTILITY ROUTINES. A CORE IMAGE CONVERTER IS PROVIDED WHICH WILL CONVERT THE RELOCATABLE BINARY OBJECT TAPE OF A MAINLINE AND ALL CALLED SUBROUTINES INTO A SINGLE CORE IMAGE BINARY TAPE. THIS TAPE MAY THEN BE LOADED WITH A CORE IMAGE LOADER WHICH HAS NO RELOCATING OR CROSS-REFERENCING ABILITIES. THE ASSEMBLY AND COMPRESSION RATE WILL VARY WITH THE NUMBER OF CHARACTERS PER STATEMENT IN THE PROGRAM. IN GENERAL, THE TOTAL PROCESSING TIME WILL BE PROPORTIONAL TO THE TOTAL

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 NUMBER OF CHARACTERS IN THAT INPUT PROGRAM, PLUS THE ASSEMBLER OR COMPRESSOR LOAD TIME.
 - THE ASSEMBLER LOAD TIME IS 5.5 MINUTES.
 - THE COMPRESSOR LOAD TIME IS 3.7 MINUTES.
 FOR COMPRESSING ALL BUT VERY SMALL PROGRAMS, THE COMPRESSION RATE WILL BE ABOUT 16 STATEMENTS/MINUTE /FIGURED ON STATEMENT SIZE OF ABOUT 26 CHARACTERS/. FOR VERY SMALL SUBROUTINES, THE RATE WILL BE SOMEWHAT LOWER DUE TO THE EXTRA TIME REQUIRED TO PUNCH THE LOAD/KEY OVERLAY RECORDS.
 THE 1054 HEADS 15 CHARACTERS/SECOND AND THE 1055 PUNCHES 15 CHARACTERS/SECOND.
 MINIMUM SYSTEM REQUIREMENTS- FOR PROGRAM GENERATION AND EXECUTION -- A 4,096 WORD 1800 SYSTEM PROCESSOR-CONTROLLER... 1054 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH. ENGINEERING CHANGE LEVEL 415164.

BASIC PROGRAM MATERIAL -
 DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS GUIDE C26-3751.
 MACHINE READABLE - UNEDITED ASSEMBLER TAPE... UNEDITED COMPRESSOR TAPE... ASSEMBLER SAMPLE PROGRAM TAPE.

1800-F0-007 FORTRAN COMPILER
 ORDER THROUGH LOCAL IBM BRANCH OFFICE
 SPECIFY FILE NUMBER 1800-F0-007

THE IBM 1800 FORTRAN COMPILER IS A CODING SYSTEM WITH A LANGUAGE THAT CLOSELY RESEMBLES THE LANGUAGE OF MATHEMATICS. IT IS A SYSTEM DESIGNED PRIMARILY FOR SCIENTIFIC AND ENGINEERING COMPUTATIONS. SINCE THIS SYSTEM IS ESSENTIALLY PROBLEM-ORIENTED RATHER THAN MACHINE-ORIENTED, IT PROVIDES SCIENTISTS AND ENGINEERS WITH A METHOD OF COMMUNICATION THAT IS MORE FAMILIAR, EASIER TO LEARN, AND EASIER TO USE THAN ACTUAL MACHINE LANGUAGE. THE FORTRAN PROCESSOR ACCEPTS SOURCE PROGRAM STATEMENTS AS INPUT FROM CARDS, THE TYPEWRITER OR PAPER TAPE AND PRODUCES, AS OUTPUT, A MACHINE LANGUAGE PROGRAM. AT OBJECT TIME, THE SYSTEM UTILIZES ADVANCED TECHNIQUES, SUCH AS RELOCATABLE SUBROUTINES, HIGHLY COMPRESSED FORMATS AND FLEXIBLE INPUT AND OUTPUT COMMAND STRUCTURES WHICH FACILITATE DATA CONVERSION OPERATIONS. THE FORTRAN LANGUAGE OPTIMIZES REDUNDANT SUBSCRIPT CALCULATIONS TO PRODUCE AN EFFICIENT OBJECT PROGRAM. THE FORTRAN LANGUAGE PROVIDES A HIGH LEVEL OF LANGUAGE POWER AND FLEXIBILITY WITH MINIMAL MACHINE REQUIREMENTS.
 MINIMUM SYSTEM REQUIREMENTS- FOR COMPILATION -- A 4,096 WORD 1800 SYSTEM PROCESSOR-CONTROLLER... 1816 PRINTER-KEYBOARD OR 1053 PRINTER OR 1443 PRINTER... 1442 CARD READ PUNCH MODEL 6 OR 7 AND ENGINEERING CHANGE LEVEL 415164.

BASIC PROGRAM MATERIAL -
 DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS GUIDE C26-3751.
 MACHINE READABLE - UNEDITED COMPILER DECK... FORTRAN COMPILER EDITOR... FORTRAN SAMPLE PROGRAM.

1800-F0-008 FORTRAN COMPILER
 ORDER THROUGH LOCAL IBM BRANCH OFFICE
 SPECIFY FILE NUMBER 1800-F0-008

THE IBM 1800 FORTRAN COMPILER IS A CODING SYSTEM WITH A LANGUAGE THAT CLOSELY RESEMBLES THE LANGUAGE OF MATHEMATICS. IT IS A SYSTEM DESIGNED PRIMARILY FOR SCIENTIFIC AND ENGINEERING COMPUTATIONS. SINCE THIS SYSTEM IS ESSENTIALLY PROBLEM-ORIENTED RATHER THAN MACHINE-ORIENTED, IT PROVIDES SCIENTISTS AND ENGINEERS WITH A METHOD OF COMMUNICATION THAT IS MORE FAMILIAR, EASIER TO LEARN, AND EASIER TO USE THAN ACTUAL MACHINE LANGUAGE. THE FORTRAN PROCESSOR ACCEPTS SOURCE PROGRAM STATEMENTS AS INPUT FROM CARDS, THE TYPEWRITER OR PAPER TAPE AND PRODUCES, AS OUTPUT, A MACHINE LANGUAGE PROGRAM. AT OBJECT TIME, THE SYSTEM UTILIZES ADVANCED TECHNIQUES, SUCH AS RELOCATABLE SUBROUTINES, HIGHLY COMPRESSED FORMATS AND FLEXIBLE INPUT AND OUTPUT COMMAND STRUCTURES WHICH FACILITATE DATA CONVERSION OPERATIONS. THE FORTRAN LANGUAGE OPTIMIZES REDUNDANT SUBSCRIPT CALCULATIONS TO PRODUCE AN EFFICIENT OBJECT PROGRAM. THE FORTRAN LANGUAGE PROVIDES A HIGH LEVEL OF LANGUAGE POWER AND FLEXIBILITY WITH MINIMAL MACHINE REQUIREMENTS.
 MINIMUM SYSTEM REQUIREMENTS- FOR COMPILATION -- A 4,096 WORD 1800 SYSTEM PROCESSOR-CONTROLLER... 1054 PAPER TAPE READER AND... 1055 PAPER TAPE PUNCH. ENGINEERING CHANGE LEVEL 415164.

BASIC PROGRAM MATERIAL -
 DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS GUIDE C26-3751.
 MACHINE READABLE - UNEDITED TAPES FOR INPUT PHASE FOR 1816/1053... AND FOR 1443... PART 2 OF FORTRAN COMPILER FOR 1816/1053... AND FOR 1443... FORTRAN COMPILER EDITOR TAPE... FORTRAN SAMPLE PROGRAM TAPE.

1800-LM-003 SUBROUTINE LIBRARY
 ORDER THROUGH LOCAL IBM BRANCH OFFICE
 SPECIFY FILE NUMBER 1800-LM-003

THE IBM 1800 SUBROUTINE LIBRARY PROVIDES ARITHMETIC, FUNCTIONAL, CODE CONVERSION, I/O CONTROL AND SELECTIVE DUMP SUBROUTINES FOR USE BY OBJECT PROGRAM GENERATED BY THE 1800 ASSEMBLER OF THE 1800 FORTRAN LANGUAGE. THE FLOATING POINT SUBROUTINES IN THE 1800 SUBROUTINE LIBRARY OFFER TWO RANGES OF PRECISION- STANDARD PRECISION AND EXTENDED PRECISION. THE STANDARD RANGE PROVIDES 23 BITS OF PRECISION., THE EXTENDED RANGE PROVIDES UP TO 31 BITS OF PRECISION. THE SUBROUTINES INCLUDE FLOATING-POINT, FIXED-POINT, SPECIAL FUNCTION, CODE CONVERSION, I/O CONTROL AND SELECTIVE DUMP. THE SUBROUTINES ARE USED BY FORTRAN LANGUAGE OR ASSEMBLER OBJECT PROGRAM TO PERFORM FLOATING-POINT, FIXED-POINT ARITHMETIC, AND FUNCTIONAL OPERATIONS., THE CONVERSION OF DATA FROM ONE I/O CODE TO ANOTHER., THE CONTROL OF I/O ACTIVITY ON THE DEVICES ATTACHED TO THE SYSTEM., AND THE SELECTIVE DUMPING OF MEMORY AREAS FOR DEBUGGING PURPOSES.
 MINIMUM SYSTEM REQUIREMENTS- AN 1800 SYSTEM WITH AN 1801 OR 1802 PROCESSOR-CONTROLLER WITH 4,096 WORDS OF CORE STORAGE AND APPLICABLE I/O EQUIPMENT IS REQUIRED FOR EXECUTION OF THE SUBROUTINES. ENGINEERING CHANGE LEVEL 415164. THE I/O SUPPORTED DEVICES ARE- 2401/2402 MAGNETIC TAPE UNIT... 1442 CARD READ PUNCH... 1443 PRINTER... 1627 PLOTTER... 231C DISK FILE... ANALOG INPUT... DIGITAL INPUT... ANALOG/DIGITAL OUTPUT... 1816/1053 KEYBOARD-PRINTER.

CONTINUED FROM PRIOR COLUMN--

BASIC PROGRAM MATERIAL -
 DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS GUIDE C26-3751.
 MACHINE READABLE - STANDARD AND EXTEND PRECISION ONE AND TWO WORD CALLS DECK... COMMON ONE AND TWO WORD CALLS DECK... EDD1 RECORDS... EDD2 RECORDS... /UNEDITED/. DUMP 80 SUBROUTINES DECK... ISS ROUTINES /UNEDITED/... COMMON 1 WORD CALLS AND CONVERSION ROUTINES WHICH MUST FOLLOW ISS ROUTINES... EDITOR FOR SUBROUTINE DECKS DUMP 80 UTILITY PROGRAM AND THE ISS ROUTINES DECK.

1800-LM-004 SUBROUTINE LIBRARY
 ORDER THROUGH LOCAL IBM BRANCH OFFICE
 SPECIFY FILE NUMBER 1800-LM-004

THE IBM 1800 SUBROUTINE LIBRARY PROVIDES ARITHMETIC, FUNCTIONAL, CODE CONVERSION, I/O CONTROL AND SELECTIVE DUMP SUBROUTINES FOR USE BY OBJECT PROGRAM GENERATED BY THE 1800 ASSEMBLER OF THE 1800 FORTRAN LANGUAGE. THE FLOATING POINT SUBROUTINES IN THE 1800 SUBROUTINE LIBRARY OFFER TWO RANGES OF PRECISION- STANDARD PRECISION AND EXTENDED PRECISION. THE STANDARD RANGE PROVIDES 23 BITS OF PRECISION., THE EXTENDED RANGE PROVIDES UP TO 31 BITS OF PRECISION. THE SUBROUTINES INCLUDE FLOATING-POINT, FIXED-POINT, SPECIAL FUNCTION, CODE CONVERSION, I/O CONTROL AND SELECTIVE DUMP. THE SUBROUTINES ARE USED BY FORTRAN LANGUAGE OR ASSEMBLER OBJECT PROGRAM TO PERFORM FLOATING-POINT, FIXED-POINT ARITHMETIC, AND FUNCTIONAL OPERATIONS., THE CONVERSION OF DATA FROM ONE I/O CODE TO ANOTHER., THE CONTROL OF I/O ACTIVITY ON THE DEVICES ATTACHED TO THE SYSTEM., AND THE SELECTIVE DUMPING OF MEMORY AREAS FOR DEBUGGING PURPOSES.
 MINIMUM SYSTEM REQUIREMENTS- AN 1800 SYSTEM WITH AN 1801 OR 1802 PROCESSOR-CONTROLLER WITH 4,096 WORDS OF CORE STORAGE AND APPLICABLE I/O EQUIPMENT IS REQUIRED FOR EXECUTION OF THE SUBROUTINES. ENGINEERING CHANGE LEVEL 415164. THE I/O SUPPORTED DEVICES ARE- 2401/2402 MAGNETIC TAPE UNIT... 1054 PAPER TAPE READER... 1055 PAPER TAPE PUNCH... 1443 PRINTER... 1627 PLOTTER... 231C DISK FILE... ANALOG INPUT... DIGITAL INPUT... ANALOG/DIGITAL OUTPUT... 1816/1053 KEYBOARD-PRINTER.

BASIC PROGRAM MATERIAL -
 DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS GUIDE C26-3751.
 MACHINE READABLE - STANDARD AND EXTEND PRECISION ONE AND TWO WORD CALLS TAPES... COMMON ONE AND TWO WORD CALLS TAPES... EDD1 RECORDS... EDD2 RECORDS... /UNEDITED/ DUMP 80 SUBROUTINES TAPE... ISS ROUTINES WITH EDD2 RECORDS /UNEDITED/... COMMON 1 WORD CALLS AND CONVERSION ROUTINES... EDITOR SUBROUTINE FOR THE DUMP 80 SUBROUTINES TAPE AND THE ISS ROUTINES WITH EDD2 RECORDS.

1800-CS-001 IBM 1800 TIME-SHARING
 EXECUTIVE SYSTEM /TSX-PHASE 1/
 ORDER THROUGH LOCAL IBM BRANCH OFFICE
 SPECIFY FILE NUMBER 1800-CS-001

THE IBM 1800 TIME-SHARING EXECUTIVE SYSTEM /TSX-PHASE 1/ IS A SELF-CONTAINED OPERATING SYSTEM TO BE USED ON AN 1800 DATA ACQUISITION AND CONTROL COMPUTER FOR PROCESS CONTROL AND DATA ACQUISITION PROGRAM SUPERVISION. THE IBM 1800 TSX IS A REAL-TIME PROGRAMMING SYSTEM THAT AFFORDS THE USER A CONVENIENT MEANS OF GENERATING AND USING A COMPLETE PROCESS CONTROL OR DATA ACQUISITION SYSTEM. THE SYSTEM PROGRAMS PROVIDED ARE-

- ASSEMBLER PROGRAM- THE ASSEMBLER IS A DISK ORIENTED SYMBOLIC ASSEMBLY PROGRAM THAT TRANSLATES PROGRAMS WRITTEN IN SYMBOLIC LANGUAGE INTO MACHINE LANGUAGE. BASICALLY, IT IS A ONE-FOR-ONE TYPE ASSEMBLY PROGRAM. PROVISION IS ALSO INCLUDED FOR THE USER TO EASILY MAKE USE OF INPUT/OUTPUT, CONVERSION, AND ARITHMETIC SUBROUTINES THAT ARE A PART OF THE SUBROUTINE LIBRARY.
- FORTRAN COMPILER PROGRAM- THE FORTRAN COMPILER IS A DISK ORIENTED PROGRAM. IT TRANSLATES PROGRAMS WRITTEN IN THE FORTRAN LANGUAGE INTO MACHINE LANGUAGE AND AUTOMATICALLY PROVIDES FOR CALLING THE NECESSARY ARITHMETIC, FUNCTIONAL, CONVERSION, AND INPUT/OUTPUT SUBROUTINES.
- DISK UTILITY PROGRAM /DUP/- DUP IS A SET OF ROUTINES DESIGNED TO AID THE USER IN PERFORMING THE FUNCTIONS OF DISK MAINTENANCE. THAT IS, IT IS CAPABLE OF STORING, DELETING, AND OUTPUTTING USERS PROGRAMS, DEFINING SYSTEM AND MACHINE PARAMETERS, AND ALSO MAINTAINING COMMUNICATIONS AREAS.
- NONPROCESS SUPERVISOR- THIS PROGRAM SUPERVISES ALL NON-PROCESS MONITOR OPERATIONS. IT DECODES THE MONITOR CONTROL RECORDS IN THE STACKED INPUT FOR NONPROCESS JOBS AND CALLS THE PROPER MONITOR PROGRAM TO PERFORM THE DESIRED OPERATION. THE SUPERVISOR PROVIDES CONTINUOUS PROCESSOR-CONTROLLER OPERATION DURING A SEQUENCE OF JOBS THAT MIGHT OTHERWISE INVOLVE SEVERAL INDEPENDENT PROGRAMMING SYSTEMS. IT ALSO DIRECTS THE TRANSFER OF CONTROL BETWEEN THE MONITOR PROGRAMS AND THE USERS PROGRAMS.
- PROCESS SUPERVISOR- THE PROCESS SUPERVISOR CONTROLS EXECUTION OF PROCESS PROGRAMS. IT CONSISTS OF THE SKELETON EXECUTIVE, ERROR DETECTION PROGRAMS, AND CERTAIN OTHER ON-LINE SPECIAL PURPOSE START-UP AND ANALYSIS ROUTINES. THE SKELETON EXECUTIVE IS BUILT UP FROM ROUTINES THE USER HAS ASSEMBLED AND COMPILED. MANY DIFFERENT OPTIONS MAY BE SPECIFIED USING EQUATE STATEMENTS WHEN THESE ROUTINES ARE ASSEMBLED. THE USER MAY INCLUDE FREQUENTLY CALLED SUBROUTINES AND HIGH PRIORITY INTERRUPT ROUTINES IN THE SKELETON. THE CONTROL OF TIMERS AND THE SCHEDULING OF CORE LOADS AND INTERRUPT ROUTINES ARE HANDLED BY ROUTINES SUPPLIED BY IBM.

THE EFFICIENCIES LISTED IN THE FOLLOWING SECTIONS VARY DEPENDING ON THE MACHINE CONFIGURATION, DISK AND CORE LAYOUT, AND THE USER PROGRAM SIZE AND TYPE. THE IBM 1800 TSX PROGRAMS HAVE THE FOLLOWING APPROXIMATE CORE STORAGE AND EXECUTION SPEEDS-

- ASSEMBLER- CORE STORAGE- MINIMUM 3692 WORDS AT THE HIGH END OF CORE. DISK STORAGE- 41 SECTORS. SAMPLE SPEEDS- WITH 1442 MODEL 7 - NO LISTING, 320 CDS/MIN WITH 1443 /MOD 1/ LISTING 103 CDS/MIN /52 CHAR. SET/. - 1443 /MOD 2/ LISTING 140 CDS/MIN

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CONTINUED FROM PRIOR PAGE--

WITH 1442 MODEL 6 - /52 CHAR. SET/.
 - 1053 17 CDS/MIN
 - NO LISTING. 250 CDS/MIN
 - 1443 /MOD 1/ LISTING 95 CDS/MIN
 - /52 CHAR. SET/.
 - 1443 /MOD 2/ LISTING 125 CDS/MIN
 - /52 CHAR. SET/.
 - 1053 16 CDS/MIN
 - FORTRAN COMPILER-
 CORE STORAGE- MINIMUM 3692 WORDS AT THE HIGH END OF CORE.
 DISK STORAGE- 104 SECTORS.
 SAMPLE SPEEDS- ASSUMING A 150 STATEMENT PROGRAM-
 WITH LISTINGS AND WITHOUT PUNCHING 47 STMTS/MIN
 WITH LISTINGS AND WITH PUNCHING 38 STMTS/MIN
 /ASSUME 50 CDS PCH/.
 - DISK UTILITY PROGRAM-
 CORE STORAGE- 3692 WORDS AT THE HIGH END OF CORE.
 DISK STORAGE- 65 SECTORS.
 SPEED-
 THE STORE OPERATION VARIES IN SPEED DEPENDING ON
 THE SIZE OF THE PROGRAM AND THE NUMBER AND DISTANCE
 OF THE DISK ARM MOVEMENTS NEEDED. NORMALLY, AN
 ASSEMBLED PROGRAM WILL BE STORED IN 15 OR 20 SECONDS
 AFTER THE STORE CONTROL CARD IS READ BY DUP.
 OTHER DUP OPERATIONS WILL NOT BE PERFORMED OFTEN IN
 MOST 1800 INSTALLATIONS, SO THE TIME THEY REQUIRE IS
 NOT SIGNIFICANT TO THE TOTAL USE OF THE 1800.
 - NONPROCESS SUPERVISOR /WITH CORE LOAD BUILDER/.
 CORE STORAGE- 3692 AT THE HIGH END OF CORE.
 DISK STORAGE- 17 SECTORS.
 SPEED-
 THE CONTROL CARD ANALYZER OPERATES AT CARD READ SPEED
 FOR MOST CONTROL CARDS. THE CORE LOAD BUILDER
 REQUIRES FROM SEVERAL SECONDS TO ABOUT THIRTY SECONDS
 UNDER WORST CONDITIONS. THE NORMAL TIME FOR AN BK
 CORE LOAD IS 7 CR 8 SECONDS.
 - PROCESS SUPERVISOR-
 CORE STORAGE-
 MINIMUM SYSTEM /BK/ MUST PROVIDE 4500 WORDS FOR THE
 IN-CORE SKELETON IF THAT SKELETON IS TO BE USED
 OFF-LINE WITH THE NONPROCESS MONITOR. /THIS MEANS
 THAT 3692 WORDS WILL BE AVAILABLE ABOVE THE SKELETON
 FOR THE NONPROCESS MONITOR/. IF A SEPARATE SKELETON
 IS USED FOR OFF-LINE WORK, THE ON-LINE SKELETON
 MAY BE 5692 WORDS. /THIS LEAVES 2500 WORDS FOR
 ERROR DECISION PROGRAMS AND THE COLD START ROUTINE
 AT THE HIGH END OF CORE STORAGE/. THE MAXIMUM SIZE
 OF THE SKELETON IS ALWAYS DETERMINED BY THE BALANCE
 OF CORE STORAGE ABOVE THE SKELETON -- 3692 MINIMUM
 FOR NON-PROCESS MONITOR USE OR 2500 MINIMUM FOR ERROR
 DECISION PROGRAM AND COLD START USE.
 DISK STORAGE- 46 TO 131 SECTORS.
 SPEED-
 THE EXECUTION TIME OF PROCESS CORE LOADS IS DEPENDENT ON
 WHAT THEY HAVE BEEN PROGRAMMED TO DO. THE READING
 OF CORE LOADS BY THE PROCESS SUPERVISOR IS DONE
 WITH DISK ADDRESSES THAT ARE IN CORE WHEN THE NEW
 CORE LOAD IS CALLED. ALL PROCESS CORE LOADS ARE
 IN CORE IMAGE FORMAT AND ARE OBTAINED AT DISK READ
 SPEED. INTERRUPTS MAY BE PERMANENTLY IN CORE WITH
 THE SKELETON, ON DISK AS INTERRUPT CORE LOADS, OR IN
 CORE WITH MAINLINE CORE LOADS. SKELETON INTERRUPT
 ROUTINES ARE RESPONDED TO IMMEDIATELY. THE RESPONSE
 TIME OF A MAINLINE INTERRUPT ROUTINE IS THE SAME AS
 THAT OF A SKELETON INTERRUPT ROUTINE ONLY IF THE
 MAINLINE CORE LOAD CONTAINING THE INTERRUPT ROUTINE
 IS IN CORE WHEN THE INTERRUPT OCCURS. THE INTERRUPT
 CORE LOAD RESPONSE TIME DEPENDS ON THE SIZE OF THE
 CORE-LOAD AND DISK LAYOUT. IT IS THEREFORE CONSIDERABLY
 SLOWER THAN THE SKELETON OR MAINLINE CORE LOAD
 INTERRUPTS. ERROR DECISION PROGRAMS ARE READ INTO
 CORE AFTER SAVING 1800 WORDS OF CORE FOR THEIR RESIDENTS.
 IF A DUMP TO DISK IS INCLUDED AS AN ERROR DECISION
 OPTION, THE DUMP WILL WRITE ALL OF CORE TO DISK.
 THESE OPERATIONS PROCEED AT DISK READ-WRITE SPEED.

MINIMUM SYSTEM CONFIGURATION- THE SYSTEM REQUIRES AN IBM 1801
 CR 1802 PROCESSOR-CONTROLLER /EC LEVEL NO. 415164/ WITH
 BK OF CORE STORAGE, ONE 231C DISK STORAGE DRIVE, A 1053 PRINTER
 CR 1443 PRINTER OR 1816 PRINTER-KEYBOARD /PRINTER PORTION ONLY/,
 AND A 1442 CARD/READ PUNCH.

BASIC PROGRAM MATERIAL -
 DOCUMENTATION - PROGRAM MATERIAL LIST... SYSTEM
 SPECIFICATIONS, C26-5990... OPERATING PROCEDURES, C26-3754
 MACHINE READABLE - TWENTY-FOUR OBJECT DECKS /TASK, SYSTEM
 LOADER, ASSIGNMENT CARDS, LET, DISK COMMUNICATION,
 BCCTSTRAP LOADER, SUPERVISOR, CORE LOAD BUILDER, CCLC
 START, DISK UTILITIES, ASSEMBLER, FORTRAN, ERROR PRGCS,
 TSX MISCELLANEOUS SUBROUTINES, TSX ARITHMETICS AND
 FUNCTIONALS, TSX CONVERSION SUBROUTINES, TSX FORTRAN I/O
 SUBROUTINES, TSX ICCS SUBROUTINES, SKELETON BUILDER, TASK
 CARD TO DISK, TASK DISK TO CARD, TASK DISK PATCH, TASK
 DISK DUPLICATION, TASK DISK LOAD FOR OFF-LINE SYSTEM/...
 THREE SOURCE DECKS /SYSTEM DIRECTOR, TASK, SAMPLE
 PROBLEM/.

1800-LI-001 UTILITY ROUTINES
 ORDER THROUGH LOCAL IBM BRANCH OFFICE
 SPECIFY FILE NUMBER 1800-LI-001

THESE PROGRAMS WILL MAKE IT POSSIBLE TO PROGRAM THE 1800 IN
 A WIDE RANGE OF DATA ACQUISITION AND REAL-TIME CONTROL
 APPLICATIONS. THE UTILITY PROGRAMS INCLUDE- /1/ AN INPUT/OUTPUT
 ROUTINE WHICH ACCEPTS DATA FROM ONE OF THREE MEDIA /CARD, PAPER
 TAPE AND MAGNETIC TAPE/ AND OUTPUTS DATA TO ONE OF TWO OF FIVE
 OUTPUT DEVICES /CARD, PAPER TAPE, MAGNETIC TAPE, TYPEWRITER
 AND PRINTER/. WHEN TWO OUTPUT DEVICES ARE REQUIRED, ONE MUST
 BE A PRINT OPTION /1053 OR 1443 PRINTER/. /2/ DUMP ROUTINES
 WHICH PERMIT THE USER TO DUMP ANY AREA OF MEMORY. OUTPUT
 CAN BE OBTAINED ON CARDS, TYPEWRITER, PRINTER OR MAGNETIC TAPE.
 /3/ LOADER ROUTINES - RELOCATING LOADER, CORE IMAGE CONVERTER,
 CORE IMAGE LOADER.
 THESE ROUTINES PROVIDE THE PROGRAMMER WITH A VERSATILE TOOL
 FOR TRANSFERRING DATA FROM ONE MEDIUM TO ANOTHER AND ALSO
 FOR PERFORMING THE REPETITIVE UTILITY FUNCTIONS NEEDED DAILY
 FOR MOST DATA PROCESSING INSTALLATIONS.
 MINIMUM SYSTEM REQUIREMENTS- A 4096 WORD 1800 SYSTEM
 PROCESSOR-CONTROLLER... 1053 PRINTER... 1442 CARD READ PUNCH
 MODEL 6 OR 7... ENGINEERING CHANGE LEVEL 415164.

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CONTINUED FROM PRIOR COLUMN--

BASIC PROGRAM MATERIAL -
 DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS
 GUIDE C26-3751.
 MACHINE READABLE - 19 UTILITY DECKS.

1800-UT-002 UTILITY ROUTINES
 ORDER THROUGH LOCAL IBM BRANCH OFFICE
 SPECIFY FILE NUMBER 1800-UT-002

THESE PROGRAMS WILL MAKE IT POSSIBLE TO PROGRAM THE 1800 IN
 A WIDE RANGE OF DATA ACQUISITION AND REAL-TIME CONTROL
 APPLICATIONS. THE UTILITY PROGRAMS INCLUDE- /1/ AN INPUT/OUTPUT
 ROUTINE WHICH ACCEPTS DATA FROM ONE OF THREE MEDIA /CARD, PAPER
 TAPE AND MAGNETIC TAPE/ AND OUTPUTS DATA TO ONE OF TWO OF FIVE
 OUTPUT DEVICES /CARD, PAPER TAPE, MAGNETIC TAPE, TYPEWRITER
 AND PRINTER/. WHEN TWO OUTPUT DEVICES ARE REQUIRED, ONE MUST
 BE A PRINT OPTION /1053 OR 1443 PRINTER/. /2/ DUMP ROUTINES
 WHICH PERMIT THE USER TO DUMP ANY AREA OF MEMORY. OUTPUT
 CAN BE OBTAINED ON CARDS, TYPEWRITER, PRINTER OR MAGNETIC TAPE.
 /3/ LOADER ROUTINES - RELOCATING LOADER, CORE IMAGE CONVERTER,
 CORE IMAGE LOADER.
 THESE ROUTINES PROVIDE THE PROGRAMMER WITH A VERSATILE TOOL
 FOR TRANSFERRING DATA FROM ONE MEDIUM TO ANOTHER AND ALSO
 FOR PERFORMING THE REPETITIVE UTILITY FUNCTIONS NEEDED DAILY
 FOR MOST DATA PROCESSING INSTALLATIONS.
 MINIMUM SYSTEM REQUIREMENTS- A 4096 WORD 1800 SYSTEM
 PROCESSOR-CONTROLLER... 1053 PRINTER... 1053 PAPER TAPE READER
 AND 1055 PAPER TAPE PUNCH. ENGINEERING CHANGE LEVEL 415164.

BASIC PROGRAM MATERIAL -
 DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS
 GUIDE C26-3751.
 MACHINE READABLE - 18 UTILITY TAPES.

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1130-00.0.003 MODIFICATIONS TO THE 1130
MONITOR SYSTEM
AVAILABLE 3RD QUARTER 1966.
SPECIFY FILE NUMBER 1130-00.0.003

AUTHOR...MRS. J.O. SILENCE

DIRECT INQUIRIES TO...
MRS. J.O. SILENCE, ALLISON DIV., GMC, PLANT 8, DEPT. 8895,
INDIANAPOLIS, IND.

VARIOUS SUBROUTINES WERE MODIFIED TO AFFECT CHANGES IN ORDER TO ACQUIRE AN "OPEN SHOP", BATCH TYPE OPERATION. CHANGES WERE MADE IN AREAS CONCERNING THE SINGLE HCPPR, CARRIAGE CONTRL, EXECUTION ERROR MESSAGES, AND NUMERIC FORMATTED INPUT. AN 1130 CARD SYSTEM IS REQUIRED. PROGRAMMED IN- 1130 FORTRAN AND 1130 ASSEMBLER AND IS A SUBROUTINE USED WITH 1130 FORTRAN AND ASSEMBLER. THE SOURCE DECK IS OPTIONAL MATERIAL AND MUST BE SPECIFICALLY REQUESTED ON THE ORDER CARD.

1130-00.1.001 DRAW AND PLOT SUBROUTINES
AVAILABLE 4TH QUARTER 1966.
SPECIFY FILE NUMBER 1130-00.1.001

AUTHOR...MR. B.F. MAYOFF

DIRECT INQUIRIES TO...
MR. B.F. MAYOFF, IBM CORP., 80 E. LAKE ST., CHICAGO, ILL.

DRAW IS A GENERALIZED SUBROUTINE FOR PLOTTING THE SMOOTHEST STRAIGHT LINE BETWEEN TWO POINTS. WRITTEN IN 1130 SYMBGLIC ASSEMBLY PROGRAM LANGUAGE, IT REQUIRES AS PARAMETERS THE COORDINATES OF THE CURRENT PEN LOCATION, P SUB 1 AND THOSE OF THE SECOND POINT, P SUB 2. DRAW MAY BE USED BY FORTRAN OR SAP MAINLINE PROGRAMS AND IN TURN CALLS THE SUBROUTINE PLOT. PLOT IS A BASIC SUBROUTINE WHICH PROVIDES THE PROGRAMMER WITH A SIMPLE MEANS OF CONTROLLING THE BASIC 1627 PLOTTER FUNCTIONS. REQUIRING AS PARAMETERS THE DESIRED PLOTTER FUNCTION AND THE NUMBER OF TIMES TO REPEAT THE FUNCTION, IT CAN BE OF GREAT USE TO THE FORTRAN PROGRAMMER. PLOT USES THE IBM LIBRARY SUBROUTINE PLOT1. MACHINE CONFIGURATION- BASIC 1130 WITH APPROPRIATE I/O EQUIPMENT.
THIS THE CARD VERSION OF 00.1.002

1130-00.1.002 DRAW AND PLOT SUBROUTINES
AVAILABLE 4TH QUARTER 1966.
SPECIFY FILE NUMBER 1130-00.1.002

AUTHOR...MR. B.F. MAYOFF

DIRECT INQUIRIES TO...
MR. B.F. MAYOFF, IBM CORP., 80 E. LAKE ST., CHICAGO, ILL.

DRAW IS A GENERALIZED SUBROUTINE FOR PLOTTING THE SMOOTHEST STRAIGHT LINE BETWEEN TWO POINTS. WRITTEN IN 1130 SYMBGLIC ASSEMBLY PROGRAM LANGUAGE, IT REQUIRES AS PARAMETERS THE COORDINATES OF THE CURRENT PEN LOCATION, P SUB 1 AND THOSE OF THE SECOND POINT, P SUB 2. DRAW MAY BE USED BY FORTRAN OR SAP MAINLINE PROGRAMS AND IN TURN CALLS THE SUBROUTINE PLOT. PLOT IS A BASIC SUBROUTINE WHICH PROVIDES THE PROGRAMMER WITH A SIMPLE MEANS OF CONTROLLING THE BASIC 1627 PLOTTER FUNCTIONS. REQUIRING AS PARAMETERS THE DESIRED PLOTTER FUNCTION AND THE NUMBER OF TIMES TO REPEAT THE FUNCTION, IT CAN BE OF GREAT USE TO THE FORTRAN PROGRAMMER. PLOT USES THE IBM LIBRARY SUBROUTINE PLOT1. MACHINE CONFIGURATION- BASIC 1130 WITH APPROPRIATE I/O EQUIPMENT.
THIS THE TAPE VERSION OF 00.1.001

1130-03.0.002 COMET COMMERCIAL SUBROUTINES
AVAILABLE 1ST QUARTER 1966.
SPECIFY FILE NUMBER 1130-03.0.002

AUTHORS...J.R. HURLEY F. MARCUS S. PAAVOLA
J. ZIMMERMAN

DIRECT INQUIRIES TO...
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THE COMET SYSTEM IS A SET OF SUBROUTINES WHICH PERMIT THE PROGRAMMER TO PERFORM FREQUENTLY-REQUIRED COMMERCIAL OR LOGICAL FUNCTIONS IN FORTRAN WHICH WOULD OTHERWISE BE UNWARRANTED OR IMPESSIBLE. THE SUBROUTINE SET IS MODULAR, EACH SUBROUTINE BEING INCLUDED IN THE USER'S PROGRAM ONCE ONLY IF IT IS REFERENCED BY A CALL STATEMENT IN THE FORTRAN MAIN PROGRAM. COMET PROVIDES THESE FUNCTIONS- ZONE TESTING AND INSERTING., MOVES AND COMPARES OF ALPHAMERIC DATA., EDITING EQUIVALENT TO 1401 EXTENDED EDIT., CLEARING OF DATA AREAS. COMET PACKS DATA TO MINIMIZE CORE REQUIREMENTS FOR DATA STORAGE. COMET WILL RUN ON ANY IBM 1130 WHICH WILL SUPPORT FORTRAN COMPILATION, AND IS APPLICABLE TO ANY SYSTEM CONFIGURATION WITH SUFFICIENT CORE TO CONTAIN THE PROGRAM AND WITH ATTACHED I/O DEVICES THAT ARE REFERENCED IN THE FORTRAN MAIN-LINE. STORAGE REQUIREMENTS DEPEND ON FUNCTIONS USED. COMET IS WRITTEN IN 1130 ASSEMBLY LANGUAGE AND IS FURNISHED IN CARD FORM FOR USE WITH CARD-ORIENTED 1130S. IT CAN, HOWEVER, BE EASILY ADAPTED FOR USE ON PAPER TAPE CONFIGURATIONS.

1130-03.0.003 STUDENT INFORMATION SYSTEM
AVAILABLE 4TH QUARTER 1966.
SPECIFY FILE NUMBER 1130-03.0.003

AUTHOR...PETER S. RHODE

DIRECT INQUIRIES TO...
PETER S. RHODE, IBM CORP., 690 N. ROBERT ST.,
ST. PAUL, MINN. 55101

THE IBM 1130 STUDENT INFORMATION SYSTEM IS A GROUP OF PROGRAMS TO INITIALIZE AND UPDATE DISK FILE DATA USED TO PREPARE REPORTS FOR STUDENT RECORD ADMINISTRATION IN A SMALL COLLEGE, JUNIOR COLLEGE, OR HIGH SCHOOL. IT IS APPLICABLE IN THE AREAS OF REGISTRATION, GRADE REPORTING, COURSE DATA, STUDENT TRANSCRIPTS, ETC. THE STUDENT INFORMATION SYSTEM CAN HANDLE ON LINE UP TO 512 INSTRUCTORS, 2048 CLASSES, AND 4096 STUDENT RECORDS, EACH CONTAINING AT MOST 60 COURSES.

CONTINUED FROM PRIOR COLUMN--

THIS SYSTEM IS INITIALLY PROGRAMMED TO A GENERALIZED SCHOOL SITUATION. HOWEVER, IT MAY BE MODIFIED TO ACCOMMODATE INDIVIDUAL REQUIREMENTS. THE SYSTEM REQUIRES AN 8192 WORD 1130 WITH DISK, 1442 CARD READ PUNCH, AND 1132 PRINTER. THE PROGRAMS ARE WRITTEN IN ASSEMBLY LANGUAGE.

1130-05.1.001 ELECTRIC POWER SYSTEM LOAD
FLOW PROGRAM
AVAILABLE 4TH QUARTER 1966.
SPECIFY FILE NUMBER 1130-05.1.001

AUTHOR...L.D. WILLIS

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LOS ANGELES, CALIF. 90005

THE PROGRAM PRODUCES THE RESULTS OF A PERFORMANCE CALCULATION ON AN ELECTRIC POWER SYSTEM UNDER LOAD. THESE RESULTS SPECIFICALLY INCLUDE THE POWER AND REACTIVE FLOWS IN TRANSMISSION LINES AND OTHER FACILITIES. THE NODAL ITERATIVE METHOD IS USED, PROVIDING GREAT FLEXIBILITY IN PROGRESSING FROM CASE TO CASE IN POWER SYSTEM PLANNING AND OPERATING STUDIES. EXTENSIVE USER ORIENTED FEATURES ARE PROVIDED, SO THAT THE BURDENS OF DATA PREPARATION AND ANSWER INTERPRETATION ARE REDUCED TO A MINIMUM.

THE PROGRAM IS WRITTEN IN ASSEMBLER LANGUAGE AND USES THE DATA CONVERSION SUBROUTINES, THE FLOATING POINT SUBROUTINES, AND THE I/O SUBROUTINES. THE PROGRAM IS RUN UNDER 1130 MONITOR SUPERVISION. CONFIGURATION- CPU 1131-2B /8192 WORDS W/DISK/, CARD READ/PUNCH/ 1442-6 OR 7, OUTPUT ON CONSOLE TYPEWRITER OR OPTIONAL PRINTER 1132.

1130-09.7.001 MULTI-LINE INTERPOLATION
ROUTINE
AVAILABLE 3RD QUARTER 1966.
SPECIFY FILE NUMBER 1130-09.7.001

AUTHOR...MR. W.J. ELLIOTT

DIRECT INQUIRIES TO...
MRS. J. SILENCE, ALLISON DIVISION, GMC, PLANT 8, DEPT. 8895,
INDIANAPOLIS, IND.

THIS ROUTINE PROVIDES A METHOD FOR INTERPOLATING BETWEEN TABULATED FUNCTIONS OF A SINGLE VARIABLE AND TWO VARIABLES. THE METHOD EMPLOYED IS LAGRANGE INTERPOLATION, 1ST THROUGH 3RD DEGREES, IN EITHER PRIMARY OR SECONDARY INDEPENDENT VARIABLE. SYSTEM REQUIRED- 1130 WITH CARD I/O AND 1132 PRINTER. PROGRAMMED IN- 1130 ASSEMBLER. THIS IS AN 1130 FORTRAN SUBROUTINE.

1130-10.3.001 CPM/PERT FOR THE IBM 1130.
FORTRAN CODED, CRITICAL PATH SCHEDULING WITH PROBABILITY ANALYSIS
AVAILABLE 4TH QUARTER 1966.
SPECIFY FILE NUMBER 1130-10.3.001

AUTHOR...MR. J.W. BURGESSON

DIRECT INQUIRIES TO...
MR. J.W. BURGESSON, IBM CORP., 618 S. MICHIGAN,
CHICAGO, ILL. 60605

THE PURPOSE OF THIS PROGRAM IS TO PROCESS NETWORK SCHEDULING PROBLEMS. IT PROVIDES BOTH BASIC CRITICAL PATH SCHEDULING /CPM/ AND PROBABILITY ANALYSIS /PERT/. MODIFICATION INSTRUCTIONS ARE INCLUDED TO FACILITATE CONVERSION TO OTHER HARDWARE. FEATURES OF THE PROGRAM INCLUDE RANDOM NODE NUMBERING, BOTH ACTIVITY-ORIENTED AND EVENT-ORIENTED PERT REPORTING, SIMPLIFIED CODING FOR EASE OF MODIFICATION, MAXIMUMS OF 999 EVENTS, 1400 JOBS, MULTIPLE START AND ENDING NODES PERMITTED, BAR CHART REPORT, OPTIONAL PRE-SET PROJECT COMPLETION DATE AND A NETWORK LOOP-CATCHING ERROR ROUTINE.

1130-13.0.001 STEP-WISE MULTIPLE
REGRESSION PROGRAM
AVAILABLE 4TH QUARTER 1966.
SPECIFY FILE NUMBER 1130-13.0.001

AUTHOR...MASON ROSENTHAL

DIRECT INQUIRIES TO...
MASON ROSENTHAL, IBM CORP., 340 MARKET ST., SAN FRANCISCO, CALIF

THIS PROGRAM PERFORMS A STEP-WISE REGRESSION ANALYSIS ON UP TO 9999 SETS OF OBSERVATIONS ON ONE DEPENDENT VARIABLE AND UP TO 29 EXPLANATORY VARIABLES. THE PROGRAM ALLOWS FOR NINE TYPES OF ALGEBRAIC TRANSFORMATIONS OF ORIGINAL DATA. OUTPUT CONSISTS OF MEANS, STANDARD DEVIATIONS, SIMPLE CORRELATION COEFFICIENTS, AND STEP-WISE RESULTS. STEP-WISE RESULTS CONSIST OF THE STANDARD ERROR OF ESTIMATE, THE MULTIPLE CORRELATION COEFFICIENT, F, CONSTANT TERM, AND REGRESSION COEFFICIENTS AND THEIR STANDARD DEVIATIONS, STUDENTS T/S, AND BETA COEFFICIENTS. OUTPUT OF RESIDUALS IS OPTIONAL. THE PROGRAM IS WRITTEN IN FORTRAN AND REQUIRES 8K AND 1130 MONITOR FORTRAN FEATURES FOR COMPILATION AND EXECUTION.

1130-13.0.002 CALCULATION OF ELECTRICAL
DISTRIBUTION SYSTEM FAULT CURRENTS
AVAILABLE 4TH QUARTER 1966.
SPECIFY FILE NUMBER 1130-13.0.002

AUTHOR...E.P. MCLEAN, JR.

DIRECT INQUIRIES TO...
E.P. MCLEAN, JR., E.P. MCLEAN ENGINEERING CO., S. MAIN ST.,
MCULTREE, GA.

THIS PROGRAM IS DESIGNED TO COMPUTE LINE-TO-LINE, THREE-PHASE, AND LINE-TO-GROUND MAXIMUM, AS WELL AS LINE-TO-GROUND MINIMUM FAULT CURRENTS ON RADIAL DISTRIBUTION SYSTEMS. COMPUTATIONS UTILIZE A TABLE OF $\sqrt{3}$, AND $\sqrt{3}$, VALUES FOR THE APPROPRIATE WIRE SIZES. THE PROGRAM HAS ALSO PROVIDED THE

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CONTINUED FROM PRIOR PAGE--

THE USE OF CERTAIN MIXED CONDUCTORS. IF A LINE SECTION CONTAINS MIXED CONDUCTORS, THE MAXIMUM FAULT CURRENTS ARE CALCULATED BASED ON THE LARGEST SIZE CONDUCTOR AND THE MINIMUM FAULT CURRENTS ARE CALCULATED BASED ON THE SMALLER SIZE CONDUCTORS.

THE PROGRAM WILL ACCOMMODATE UP TO 60 LINE SEGMENTS OF SINGLE-PHASE, 40 LINE SEGMENTS OF TWO-PHASE (MUST BE IN FIRST 40 SECTIONS COMPUTED), AND 30 LINE SEGMENTS OF THREE-PHASE (MUST BE IN FIRST 30 SECTIONS COMPUTED). CALCULATIONS CAN BE MADE FOR TWO DIFFERENT TRANSFORMER SIZES AND SOURCE FAULT CURRENT VALUES MAKING THE SAME PASS. FOR INSTANCE, THE MAXIMUM CALCULATIONS COULD BE BASED ON ZERO SOURCE IMPEDANCE AND A TRANSFORMER CAPACITY OF 10,000 KVA WHILE, AT THE SAME TIME, MINIMUM LINE TO GROUND CALCULATIONS COULD BE BASED ON A KNOWN VALUE OF AVERAGE FAULT CURRENT ON THE HIGH SIDE OF THE TRANSFORMERS AND A SMALLER TRANSFORMER CAPACITY. A FAULT IMPEDANCE OF 40.00 OHMS HAS BEEN ASSUMED FOR MINIMUM LINE TO GROUND FAULTS. A 4K 1130 WITH PAPER TAPE READER AND PUNCH IS REQUIRED. PROGRAMMED IN FORTRAN.

1130-15.2.001 HEURISTIC CORRUGATOR SCHEDULING PROGRAM
AVAILABLE 4TH QUARTER 1966.
SPECIFY FILE NUMBER 1130-15.2.001

AUTHOR...MR. F. GUMMER:ALL

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THE HEURISTIC CORRUGATOR SCHEDULING PROGRAM SCHEDULES A BOX PLANT CORRUGATOR OR COMBINE TO PRODUCE RECTANGLES OF SPECIFIED DIMENSIONS GIVEN CUSTOMER ORDER REQUIREMENTS, CORRUGATOR PARAMETERS, AND ROLL STOCK INVENTORY. THE METHOD EMPLOYED IS SIMILAR TO THAT USED BY A HUMAN SCHEDULER AS ORDERS ARE COMBINED AND TESTED AND THE BEST ONES CHOSEN. THE ADVANTAGE OF THE COMPUTER PROGRAM IS THAT IT CAN TRY A LOT MORE COMBINATIONS IN A SHORTER PERIOD THAN THE HUMAN. THE PROGRAM IS IN FORTRAN TO RUN UNDER 1130 MONITOR ON AN 8-K CARD, 1132 PRINTER AND DISK SYSTEM.

1130-16.2.001 PIER ANALYSIS
AVAILABLE 3RD QUARTER 1966.
SPECIFY FILE NUMBER 1130-16.2.001

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THIS PROGRAM IS MAINLY INTENDED FOR A QUICK AND ACCURATE PIER ANALYSIS. THE PIER CAN HAVE TWO TO SIX COLUMNS, CANNOT HAVE INTERMEDIATE HINGES. OTHERWISE, THE PROGRAM WILL OPERATE WITHOUT ANY LIMITATIONS FOR EITHER PHYSICAL DIMENSIONS OR LOADING POSSIBILITIES. ANY MEMBER OR MEMBERS MAY BE PRISMATIC, REGULARLY HAUNCHED AND TAPERED, OR IRREGULAR. THE FOOTINGS MAY BE CONTINUOUS OR ISOLATED WITH A VARIABLE DEGREE OF FIXITY AT THE BASE OF EACH COLUMN. LOADING MAY BE THE WEIGHT OF THE PIER CAP, ANY VERTICAL OR HORIZONTAL FORCES, OR FORCES DUE TO TEMPERATURE CHANGE OR SHRINKAGE. THE PROGRAM MAY ALSO BE USED TO ANALYZE A ONE TO FIVE SPAN CONTINUOUS BEAM WITH OR WITHOUT INTEGRAL LEGS, SINCE THE HEIGHT OF ANY COLUMN OR COLUMNS MAY BE ZERO. LANGUAGE USED IS FORTRAN. MACHINE CONFIGURATION- 8K 1130 WITH DISK, CARD READ AND PUNCH, AND LINE PRINTER. THE RUNNING SPEED IS ALMOST I/O BOUND. TWO SAMPLE PROBLEMS TOGETHER COST ABOUT FOUR MINUTES.

1130-16.2.002 1130 4K COGO
AVAILABLE 4TH QUARTER 1966.
SPECIFY FILE NUMBER 1130-16.2.002

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THIS IS A FORTRAN LANGUAGE PROGRAM THAT SOLVES COORDINATE GEOMETRY PROBLEMS FOR ENGINEERS AND SURVEYORS. INPUT TO THE PROGRAM CONSISTS OF ALPHABETIC COMMANDS WHICH ARE ABBREVIATIONS OF FAMILIAR ENGINEERING TERMINOLOGY. THE PROGRAM ALLOWS THE ENGINEER TO BALANCE A TRAVERSE, COMPUTE A SUBDIVISION, CALCULATE A RIGHT-OF-WAY ETC. THE PROGRAM IS WRITTEN FOR A 4K 1130 MODEL 11 AND OPERATES UNDER THE 1130 MONITOR SYSTEM. THE PROGRAM SUPPORTS A LARGE COORDINATE TABLE OF 1270 POINTS WHICH IS STORED ON DISK. THE SYSTEM PERMITS THE USER, WHO MAY BE UNFAMILIAR WITH COMPUTERS, TO SOLVE GEOMETRICAL PROBLEMS IN HIS OWN LANGUAGE ON A BASIC 1130 DISK SYSTEM. ADVANTAGES ARE- FREE FORMAT, LARGE COORDINATE TABLE STORED ON DISK, AND SMALL MACHINE REQUIREMENTS. THE METHOD IS- MONITOR SYSTEM CONTROLLING GEOMETRY SUBROUTINES AND DATA TABLES WHICH RESIDE ON DISK. THE USER MAY EASILY MODIFY OR ADD TO THE EXISTING PROGRAM. THE ONLY LIMITATION IS THE AMOUNT OF CORE STORAGE AVAILABLE. ALL THAT IS REQUIRED IS AN UNDERSTANDING OF THE GENERAL FLOW OF THE EXISTING PROGRAM AND A KNOWLEDGE OF 1130 FORTRAN. MACHINE CONFIGURATION- A 1131 MODEL A2 /4K WITH DISK/ WITH A 1442 CARD READ-PUNCH MODEL 6 OR 7, OR 1134 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH. THIS PROGRAM IS EASILY CONVERTED TO PAPER TAPE FOR PAPER TAPE USERS.

1130-16.2.003 RETAINING WALL DESIGN
AVAILABLE 4TH QUARTER 1966.
SPECIFY FILE NUMBER 1130-16.2.003

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B-1130

CONTINUED FROM PRIOR COLUMN--

THE PROGRAM RETAINING WALL DESIGN WILL DESIGN SIMPLE RETAINING WALLS WITH A MINIMUM OF INPUT. A CHOICE IS OFFERED BETWEEN A PARTIAL DESIGN INCLUDING A SPECIFIED TGE OR FEEL SIZE, OR COMPLETE DESIGN OF SECTION. OUTPUT INCLUDES CONCRETE DIMENSIONS AND AMOUNT OF REINFORCING REQUIRED AT CRITICAL LOCATIONS. ALTERNATE DESIGNS ARE PROVIDED IF SLICING TEST IS NOT SUCCESSFUL. PROGRAM REQUIRES- 1131 CPU 8K DISK... 1132 PRINTER... 1442 CARD READ PUNCH. PROGRAMMED IN 1130 FORTRAN. OPERATION IS UNDER MONITOR SYSTEM. SAMPLE PROBLEM OPERATING TIME- ABOUT 1 MINUTE. COMPILATION TIME - FULL LISTING - ABOUT 8 MINUTES.

1130-30.1.001 PAYROLL AND LABOR COST DISTRIBUTION PACKAGE DEMONSTRATION
AVAILABLE 4TH QUARTER 1966.
SPECIFY FILE NUMBER 1130-30.1.001

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THIS PACKAGE SHOWS HOW COMMERCIAL WORK CAN BE DONE ON A SCIENTIFIC MACHINE, USING EXCLUSIVELY FORTRAN. THIS PACKAGE CONSISTS OF A SET OF PROGRAMS THAT WILL-
- ORGANIZE AND MAINTAIN EMPLOYEE FILES AND PROJECT /CR ACCOUNT/ FILES.
- COMPUTE A PAYROLL, UPDATE FILES, PRINT EARNING STATEMENTS AND PAY CHECKS.
- PRINT PAYROLL REGISTERS, AND A COST DISTRIBUTION REPORT. SINCE THIS PACKAGE IS WRITTEN PRIMARILY FOR DEMONSTRATION PURPOSES IT IS MADE AVAILABLE AS A SINGLE DECK OF CARDS /OBJECT DECKS WITH CONTROL CARDS/, WHICH CAN BE USED IN A LOAD AND GO OPERATION. DATA DECKS AND CONTROL CARDS FOR EXECUTION ARE ALSO PROVIDED. NO OPERATOR INTERVENTION WILL BE NECESSARY OTHER THAN THE OPTION ENTRIES THAT WILL BE TYPED AS INSTRUCTIONS IN CLEAR LANGUAGE ON THE CONSOLE TYPEWRITER. AS A DEMONSTRATION FEATURE, IT IS POSSIBLE, BY FLIPPING A SWITCH ON THE CONSOLE, TO PROCESS A PAYROLL BY MANUAL TYPEWRITER ENTRY, INSTEAD OF THE USUAL EMPLOYEE TIME CARD ENTRY. MINIMUM CONFIGURATION- 1131 BK, MOD 2 /DISK STORAGE/... 1132 PRINTER... 1442 CARD READER. THE OPTIONAL MATERIAL IS THE SOURCE DECK AS SHOWN IN THE BACK OF THIS MANUAL.

1800

1800-23.5.001 GAS CHROMATOGRAPH MONITORING PROGRAM
AVAILABLE 4TH QUARTER 1966.
SPECIFY FILE NUMBER 1800-23.5.001

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THIS IS A GENERALIZED SET OF PROGRAMS WHICH ALLOWS THE USER TO MONITOR LABORATORY CHROMATOGRAPHS ON A REAL TIME BASIS USING AN IBM 1800. IT IS CAPABLE OF READING ANALOG VOLTAGE OUTPUTS FROM CHROMATOGRAPHS, CHANGING AMPLIFICATION RANGES, OPERATING CONTACTS, /FOR COLUMN SWITCHING AND BACKFLUSHING/, DETECTING PEAKS, IDENTIFYING PEAKS, CALCULATING ANALYSIS RESULTS, AND REPORTING THESE RESULTS ON 1053/S/ WITH MINIMAL LABORATORY PERSONNEL INVOLVEMENT. ALSO INCLUDED IS A SET OF MAINTENANCE PROGRAMS THAT ALLOW A USER TO ADD, MODIFY, OR DELETE CHROMATOGRAPHIC METHODS BY INPUT OF DATA CARDS TO THE SYSTEM INSTEAD OF REPROGRAMMING. THE REQUIRED SYSTEM CONFIGURATION IS AS FOLLOWS- 16K 1800 /2 OR 4 MICROSECONDS/... ONE 2310... ONE 1442... ONE OR MORE 1053/S... DIGITAL INPUT POINTS... DIGITAL OUTPUT POINTS... PROCESS INTERRUPT... CUSTOMER MODIFIED ANALOG INPUT FEATURES... ONE OR MORE CUSTOMER MODIFIED 1092/S. USES 1800 TSM, FORTRAN, AND ASSEMBLY LANGUAGE.

1800-23.5.002 DDC DIRECT DIGIT PROCESS CONTROL
AVAILABLE 4TH QUARTER 1966.
SPECIFY FILE NUMBER 1800-23.5.002

AUTHORS...MR. G.W. MARKHAM D.C. JOHNSON A. DUBINSKY

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THIS PROGRAM ALLOWS THE 1800 CONTROL AND DATA ACQUISITION SYSTEM TO REPLACE CONVENTIONAL ANALOG CONTROLLERS IN CONTROL OF A PROCESS, I.E., PERFORM DIRECT DIGITAL PROCESS CONTROL. OPERATOR COMMUNICATION IS ALSO IMPLEMENTED. AN 1800 CARD SYSTEM WITH 16K OF STORAGE, ONE 1053 PRINTER, ONE 2310 DISK FILE, AND SEVERAL RPC/S, INCLUDING THE PROCESS OPERATORS CONSOLE, ARE REQUIRED. WRITTEN IN SYMBOLIC ASSEMBLY LANGUAGE, THE PROGRAM WILL RUN INDEPENDENTLY IN A DEDICATED SYSTEM.

PROGRAM LISTINGS AND FLOWCHARTS ARE AVAILABLE ONLY ON MAGNETIC TAPE, AS OPTIONAL MATERIAL. THE PROGRAM LISTINGS CAN BE PRINTED ON A 1401 USING 1401-UT-039. THE FLOWCHARTS ARE PRECEDED BY A SELF-LOADING PRINT PROGRAM. THE REEL OF TAPE REQUIRED TO OBTAIN THE OPTIONAL PROGRAM MATERIAL MAY BE SUPPLIED OR ORDERED FROM YOUR IBM REPRESENTATIVE.

Contributed Programs

List of Program Deletions

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ALPHABETIC KEY TO REASONS 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 -----.
- E. THIS PROGRAM HAS BEEN WITHDRAWN BY THE COMMON ORGANIZATION.
- F. THIS PROGRAM HAS BEEN WITHDRAWN BY THE AUTHOR.

Previous Deletions

FILE NUMBER	TITLE	REASON FOR DELETION
	1130 DELETIONS	
03-0-001	FORCOM FORTRAN COMMERCIAL SUBROUTINES	F

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