[A]   IBM Operating System/360 (OS/360 Release 4 and 5)

Releases 4 and 5 combined may now be ordered. This combined release adds several components to OS/360 which supply extensive new capability. Release 5, BDAM Extensions and DEVTYPE Macro, was originally scheduled for September 30, 1966. Release 4, PL/I F, was originally scheduled for August 31, 1966.

- BDAM ... added functions and flexibility for this access method. .

- DEVTYPE Macro ... permits assembler language programmers to maximize performance according to the I/O device actually in use.

- PL/I F (44K) ... is the first release of the new language processor which provides many powerful facilities.

- PL/I F Subroutine Library.

The maintenance release incorporated within Releases 4 and 5 can be ordered independently, if necessary. The maintenance release gives a user who has locally modified the Operating System a method of incorporating maintenance changes. All users should order replacement Release 4/5 for ease of updating, rather than the maintenance release, unless they require the selective updating facility offered by the maintenance release. Both the replacement release and the maintenance release will require a system generation run. Ordering the full replacement release does not mean that PL/I must be included in the generated system, because the system generation process allows full selectivity.

All OS/360 users must order either Release 4/5 or the maintenance release to update their system to the latest level and facilitate program maintenance through APAR service. The maintenance release for Operating System Release 3 will be available only through September 2, 1966.

Features of Release 4/5 are:

BDAM Extensions -- Provides for multivolume data sets, dynamic buffering, extended search and the CHECK Macro.

DEVTYPE -- Allows the assembler programmer to request information (via programming) relating to the characteristics of I/O devices in use, allowing a programmed selection of blocking and other factors that will optimize performance.

PL/I F (360S-NL-511) and Library (360S-LM-512) -- The first release of the compiler provides many new and significant facilities in a single high level language, such as:

- ability to describe and process many data types including fixed and floating decimal, fixed and floating binary, and character and bit strings.

- powerful editing and data conversion facilities.

- data structures for alphameric information.

- powerful debugging tools which include a balanced selection of documentation options.

- FORTRAN-like Input/Output.

The initial release provides the basic PL/I language features which will enable the user to develop experience in the use of PL/I. This release of PL/I is oriented toward scientific type applications since the key commercial language feature of Record I/O is in a subsequent release.

Subsequent releases will extend this widely accepted language which was developed in cooperation with the SHARE and GUIDE user organizations. A detailed description of the follow-on features is contained in Appendix H of the IBM System/360 Operating System PL/I (F) Programmer's Guide, C28-6594.

The initial version of the compiler has been tested in customer environments. Customer usage has proven the convenience and usefulness of many PL/I features, including stream Input/Output, powerful indexing and looping facilities, array arithmetic, language diagnostics and debugging aids. In many cases programs have required only two or three compilations to identify all source program language errors. Customers have found the language easy to learn, easy to code, easy to debug, and self-documenting.

IBM's intent continues to be to develop PL/I as a useful language for a wide range of applications. PL/I has been and will continue to be de-

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veloped with the cooperation of our users. Subsequent releases will add to the function of the language. Changes to the language and the compiler implementations will be made where necessary to enable PL/I to meet its goal of comprehensive excellence.

The PL/I F compiler has a moderate compilation rate and generates average object code. An account which runs 45% compile with several hundred FORTRAN-type jobs a day, and uses PL/I F as the prime compiler, is likely to be dissatisfied with performance. In our judgment the release of the compiler will not be suitable for production in a high compile volume environment. It is a suitable production tool for other environments where the key factor is not absolute compile time but compile cost. Additionally, the compiler is useful as an education and training tool for all accounts, offering the opportunity to learn the language and make a local evaluation without undue pressure or time constraints.

We recommend that at accounts with a PL/I interest, a representative application be developed and implemented. This will enable a total evaluation to be made considering features of language facility, programmer time, check-out time, diagnostic features, compile rate and object-time performance.

Performance Considerations

The performance of PL/I F is affected by many factors, including the compiler design, the compilation options selected, the source program statements and options, the configuration of System/360, and the nature of the application.

The compiler design utilizes "in core" techniques. The source statements are read and maintained in main storage. The compilation or translation is performed by loading "phases" of the compiler which process the stored statements. Each phase performs a particular part of the translation until the entire source program has been transformed. The source statement type determines which phases are required for translation. Phases not required for translation are bypassed and compilation rates are increased. Thus, the characteristics of the source program directly affect the compilation rate.

In addition, the compiler design provides very effective storage management. A "spill" feature is included which permits compilation of large programs in a minimum space. When additional storage is available greatly improved compilation rates are attained. However, if a compilation requires use of the "spill" feature, compilation speed is reduced.

The PL/I F compiler provides a large number of options which assist in program testing. Some of the options included with this release are an assembler-like object program listing, a cross reference listing, and a source program listing.

Each option selected requires the processing of additional compiler phases with a corresponding reduction in compile performance. However, the availability of these options significantly reduces the time and expense of testing and maintenance and affects the total cost of the programming process.

In PL/I, as with all high level languages, compile and execute performance is highly dependent upon the coding techniques of the programmer. The Programmer's Guide indicates certain preferred coding techniques.

Some general coding guide lines are:

1. Segmentation of a program requires a certain overhead for housekeeping. Excessive segmentation can result in wasted storage space with a corresponding increase in object time execution.

2. Writing arithmetic statements which use mixed data types can require an excessive number of conversions to be executed.

3. Use of ON units causes generation of additional code. Careless use within frequently executed sections of a program can cause a severe degradation in performance.

Consideration of the above factors has a direct and significant bearing on performance. The preliminary performance information in the following table is summarized from sample testing. The figures are stated as ranges to indicate the wide fluctuations an installation may obtain when using the compiler.

Model 360	Options	Input/Output	N=Number of Source Statements in Compile (Time in Sec)*
M40 F	Source, Size (44K)	DASD Input Printer Output	20+(.6 to 4.2)N
M40 G	Source, Size (96K)	DASD Input Printer Output	20+(.3 to .7)N

*For compilation only, excluding time for job scheduling.

The preliminary performance information above is based on a very small sample.

There are very few programs available which are purely of a PL/I based design. This is due to the brief but dynamic period during which the PL/I language specifications have been available. However, experience indicates that PL/I programs are usually significantly smaller than comparable FORTRAN or COBOL programs. Therefore, smaller source programs should be assumed when evaluating compilation time.

Miscellaneous Notes on Release 4/5

1. All programs using BDAM will have to be reassembled when using Release 4/5. This is due to source language parameter changes resulting from the CHECK macro requirements.

2. To include the PL/I F on a two-drive system, the user must perform a processor and library generation following the operating system generation. This is due to limited work area during generation. (See Starter Guide and System Generation Manual for specific details.)

3. Due to the phase loading arrangement of the PL/I F compiler, there is a requirement for about 550,000 bytes of storage in the library. The decision to place PL/I near the beginning, middle or end of the LINKLIB for best overall system performance must be determined based on the frequency of PL/I usage. Some installations may choose to place PL/I in a JOBLIB rather than LINKLIB. PL/I compiler location is one of many factors which systems programmers will have to evaluate in assigning library locations and organizing OS for their installation.

Note for Future Users of 2301

For those installations preparing for Operating System/360 residence on 2301, the minimum system generation configuration remains the same as the current confi⸳⸳ration for 2311 except for the addition of the 2301. The starter system address assignments for the 2301 are 1C0 or 2C0. Distribution of the system from PID will continue to be on magnetic tape or 1316 Disk Pack, but will contain the added capability of generating for 2301 residence.

Program Material: The following SRL publications appropriate to the component ordered will be shipped by PID with each initial order. Some of these SRLs are new publications which obsolete previous editions. Additional copies of the SRLs are available from Mechanicsburg. "IBM Operating System/360 Starter Operating System Guide," will be included in the release.

SRL Publications

Job Control Language	C28-6539-1
TNLs N28-2126 and N28-2128	
Operator's Guide	C28-6540-1
TNLs N28-2139 and N28-2166*	
Control Program Services	C28-6541-1
TNLs N28-2120 and N28-2121*	
System Programmer's Guide	C28-6550
TNLs N28-2145 and N28-2157	
Storage Estimates	C28-6551-1
TNLs N28-2138 and N28-2170*	
System Generation	C28-6554
TNLs N28-2136, N28-2152* and N28-2164	
Control Program Messages & Completion Codes	C28-6608
TNLs N28-2116 and N28-2144	
Maintenance	C27-6918
TNL N28-2160*	
Utility Programs	C28-6586-1
TNLs N28-2133 and N28-2156	
Sort/Merge	C28-6543-2
Assembler (E and F) Programmer's Guide	C26-3756
Assembler E Programmer's Guide	C28-6595*
TNL N28-2140*	
FORTRAN IV (E) Programmer's Guide	C28-6603
TNL N28-2119	
FORTRAN IV (E) Library Subprograms	C28-6596
TNL N28-2151	
COBOL (E) Programmer's Guide	C24-5029

Data Management	C28-6537-1
TNL N28-2131*	
Linkage Editor	C28-6538-1
TNLs N28-2129 and N28-2130	
PL/I (F) Programmer's Guide	C28-6594*
PL/I (F) Subroutine Library	C28-6590*
Graphic Programming Services for 2250 Display Unit 1	C27-6921
Graphic Programming Services for 2260 Display Station (Local)	C27-6925

The following items will also be shipped by PID when the related component is ordered: Program Material List ... Starter Operating System Guide ... Sample Problem Write-ups for Update Analysis and Recover/Replace (Utilities), Sort, Assembler (E and F), FORTRAN (E), COBOL (E), Express Graphics and PL/I (F).

When ordering OS/360, the requester will receive the entire collection of machine readable program components.

The following program components are required. To order these components submit one Program Request Card for the Primary Control Program, 360S-CI-505.

Starter System	360S-CI-514
Primary Control Program	360S-CI-505
Primary Data Management	360S-DM-508
OS/360 Utilities	360S-UT-506
Independent Utilities	360S-UT-507
Assembler E	360S-AS-036
Assembler F	360S-AS-037
Linkage Editor E	360S-ED-510
Linkage Editor F	360S-ED-521
TESTRAN	360S-PT-516

The requester may select any additional program components from the following list. However, to selectively control the distribution of documentation and maintenance material, the requester must individually list any of the following additional components on the reverse side of the order card for 360S-CI-505.

Basic Direct Access Method	360S-DM-509
Sort/Merge	360S-SM-023
FORTRAN E**	360S-FO-092
FORTRAN E Library	360S-LM-501
COBOL**	360S-CO-503
COBOL E Library	360S-LM-504
PL/I F**	360S-NL-511*
PL/I Subroutine Library	360S-LM-512*
Express Graphics	360S-IO-523

Initial distribution of OS/360 (new or replacement) is on two 2400' reels of magnetic tape, 9-track at 800 bpi ... or two 2400' reels of magnetic tape, 7-track at 800 cpi (Data Conversion feature required) ... or two 1316 Disk Packs.

Current users will receive a prepunched request card and a letter announcing the availability of combined Release 4/5 instructing them to order it through the branch office. Current users must use this prepunched Program Request Card to order either the maintenance release or the replacement release system. If used to order a replacement system, the user will receive all of the new components available with this release. To receive program documentation and maintenance for any of the new components, the user should indicate on the back of the prepunched Program Request Card the component program number of each new component required.

When ordering OS/360 on magnetic tape, either 9-track or 7-track tape must be specified on the Program Request Card. If not specified, 9-track tape will be forwarded.

The requester may forward or order magnetic tapes or forward disk packs in accordance with current procedures as described in the DP Sales Activity section of the Branch Office Manual.

 *Denotes change from previous release.

**When requesting the language compilers, the corresponding library must also be requested.

G. R. Williamson
Director of DP Marketing
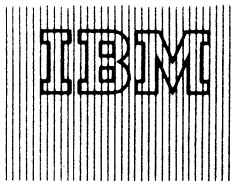
[A] BPS/360 Report Program Generator (Tape)

PID is now distributing Modification Level 1 to all users of BPS/360
Report Program Generator (Tape), 360P-RG-201. In addition to includ-
ing corrections for miscellaneous reported errors, the modification incor-
porates support for the 2520. This support allows the 2520 Card Read
Punch Model B1 to satisfy minimum system requirements for a card reader
and/or card punch, and the 2520 Card Punch Models B2 and/or B3 to
satisfy such requirements for a card punch. The 2520 may not be used
for a combined file.

SRL Publications: System/360 Basic Programming Support Specifica-
tions, Report Program Generator (Tape), C24-3418-1, amended by TNL
N24-5056 ... System/360 Basic Programming Support Operating Guide,
Basic Tape System (8K), C24-3391-1, amended by TNL N24-5083.

[B] BPS/360 Basic Tape System (8K)

PID is now distributing Modification Level 7 to all users of the BPS/360
Basic Tape System (8K), 360P-AS-091. In addition to providing cor-
rections for miscellaneous program errors, the modification incorporates the
following significant changes:

.   The 2520 Model B1 Card Read Punch, and/or Models B2 and B3
    Card Punches are now supported. This support allows use of the
    2520 Model B1 Card Read Punch to satisfy minimum system re-
    quirements for a card reader and/or punch, except that simultaneous
    card reading and punching cannot be done. This support also allows
    use of the 2520 Models B2 and/or B3 to satisfy minimum system
    requirements for a card punch.

    Note: For proper functioning of the device support routines, the
    2520 (all models) must have Engineering Changes 811839 and
    811842 installed.

.   The IOCFG and JBCTL macros have been changed to include byte
    multiplexing capability for all byte mode devices. The IOCFG
    parameter MPX = n (n = 1 to 255) causes generation of the proper
    coding in the assembled supervisor. When the MPX entry is not
    zero, queue numbers are assigned to each different device attached
    to the multiplex channel if none of these devices is a magnetic tape
    or disk drive.

.   A new macro, ZBPCL, has been added to the system. The purpose
    of this macro is to provide a means of recording the maintenance
    level of each phase and macro included in the system. The ZBPCL
    macro contains no program functions. It is intended primarily for use
    in programming analysis, and will be updated with each successive
    modification level distributed.

New SRL publications available with this modification level are:

    IBM System/360 Basic Programming Support - Assembler with Input/
    Output Macros - 8K Tape, C24-3355-4 and TNL N24-5112.

    IBM System/360 Basic Programming Support - Programmer's Guide -
    8K Tape, C24-3354-4 and TNL N24-5114.

    TNL N24-5083 to System/360 Basic Programming Support Basic
    Tape System (8K Tape), C24-3391-1.

Note: C24-3354-4 has been distributed to all registered users of   tri-
360P-AS-091.

[C] IBM System/360 Disk Operating System

Amendment to P66-45 Item A.

Page 3   The title Sort/Merge (Disk/Tape) should be changed to Sort/
         Merge (Disk).

Page 3   Under COBOL, 360N-CB-452, delete the last sentence of the
         last paragraph and add: The COBOL compiler design point is 14K

of core storage. For this reason, a 32K system is required for
compilation of COBOL programs.*

Page 3   Add to Sort/Merge (Tape), 360N-SM-400, significant features
         of the Sort/Merge are:

         . Magnetic Tapes are used as work files.

Page 3   Add to the Sort/Merge (Disk), 360N-SM-450, significant
         features of the Sort/Merge are:

         . Disk storage is used as work areas.

Page 4   First paragraph second column should read:

         The following Engineering Changes are prerequisites for proper
         functioning of DOS.

         2030 hardware logic level without 2321 EC 125910.
         2030 microprogram level with 2321 EC 128053.
         2030 hardware logic level with 2321 EC 126737
              + REA 100026.
         2321 REA 1325741 (EC 420010).
         2520 EC 811839, 811842.
         2841 EC 413140.
         2040 hardware logic level EC 254805.
         2040 microprogram level EC 254815.
         Questions regarding these EC levels should be directed to the
              servicing FE branch office.

Page 5   The titles Disk/Tape Sort/Merge and Tape Sort/Merge should be
         changed to Sort/Merge (Disk) and Sort/Merge (Tape).
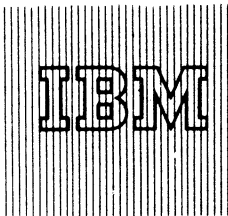
*Note: Sales Manual Page P 360.22 will be revised.

G. R. Williamson
Director of DP Marketing

[A] IBM System/360 1410/7010 Simulator Program

The 1410/7010 Simulator Program (360C-SI-754) is now available. It is a stand-alone System/360 program that enables programs that have been operating on a 1410/7010 to be executed on a System/360 having a suitable configuration. By providing program "compatibility", the simulator relieves reprogramming schedules, and can eliminate the need to convert infrequently used programs.

The Simulator produces correct results only for programs that work properly on the original system, and may produce incorrect results for time-dependent programs.

The System/360 must be equipped with the devices needed to service the simulator, as well as those required to provide a configuration corresponding to that of the original system.

The simulator requires:

- One 1052 Printer-Keyboard.
- One device for program input.
- One device for simulator control information input.
- One corresponding device for each simulated device.

In some cases, the program input, control, and simulated-device functions can be handled by the same device.

Performance under simulation depends largely on the balance of CPU and I/O operations.

Throughput: Estimates of performance under simulation are shown below as ranges of throughput ratios for a number of typical programs. A ratio greater than 1.0 means that simulation on System/360 is estimated to be faster than execution on the original system. These estimates are based on the following assumptions:

- The tape units used for simulation have at least the same data transfer rate in bytes as those of the simulated system in characters.
- The termination conditions of tape read/write operations are normal.

The throughput ratios are:

Current System	System/360 Model 40	System/360 Model 50	System/360 Model 65
1410	.20-.35	.40-.70	
7010		.25-.50	.55-.85

Factors that increase simulation throughput:

- Programs which are I/O bound on 1410/7010.
- I/O data in simulator internal format with odd parity alternate mode.

Factors that decrease simulation throughput:

- Programs which are process bound on 1410/7010.
- I/O data not in simulator internal format.

The 1410/7010 simulator handles all standard features and the following optional features of the simulated system:

- Floating point arithmetic.
- Processing overlap (#5730).
- Priority processing (#5620).
- Inverted Print-Edit (comma-period).
- One to four channels.

The main restrictions and limitations are the following:

- 1401 compatibility is not simulated.

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- Programs which rely on 1410/7010 internal machine timing to overlap I/O and CPU operations may produce incorrect results.

- No more than 25 I/O devices can be simulated simultaneously.

- Only the main console functions are simulated.

- The length of records is limited to the size of the I/O buffers (5K to 120K characters, depending on the main storage capacity of the System/360 and on that of the 1410/7010 and the number of channels simulated).

System Requirements: the simulator operates with the Standard Instruction set and the Decimal Arithmetic option. Main storage requirements depend on the 1410 or 7010 core storage being simulated as follows:

1410 Core Storage (Characters)	7010 Core Storage (Characters)	System/360 Main Storage (bytes)
10,000		65,536 (Model F)
20,000		65,536 (Model F)
40,000	40,000	131,072 (Model G)
60,000	60,000	131,072 (Model G)
80,000	80,000 (2 channels)	131,072 (Model G)
	80,000 (4 Channels)	262,144 (Model H)
	100,000	262,144 (Model H)

A System/360 device corresponding to each 1410/7010 device to be simulated is required as follows:

1410/7010 Device	System/360 Device
1415 Console	1052 Printer-Keyboard, any model compatible with the System/360 configuration
1402 Card Read Punch Model 2	2540 Card Read Punch
1442 Card Reader, Model 3	1442 Card Read Punch, Model N1 2501 Card Reader, Model B1 or B2 2520 Card Read Punch, Model B1
1403 Printer, Model 1, 2, or 3	1403 Printer, Model 2 1443 Printer, Model N1
729 Magnetic Tape Unit Models II, IV, V, VI 7330 Magnetic Tape Unit	2401, 2402, 2403 Magnetic Tape Models 1, 2, or 3

Note: 2400 series tape units models 4, 5, and 6 cannot be used.

Simulation of the 1402 Card Read Punch, Model 2, with 51-column Interchangeable Read Feed feature (#4150) requires a 2540 Card Read Punch with 51-column Interchangeable Read Feed feature (#4151).

Simulation of the 1402 Card Read Punch, Model 2, with Read and Punch Column Binary feature (#6025) requires

Side 1 of 2

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a Column Binary - Data Mode 2 feature on the 2821 Control Unit (#1990).

Any 2400-series Magnetic Tape Unit used to read or write 7-track tapes must be equipped with the 7-track Compatibility feature (#7125) and a 7-track Read/Write Head (#9557). The 7-track Compatibility feature must be installed on the associated tape control unit. Information on simulation limitations and performances under simulation can be found in the SRL publication, IBM System/360 Conversion Aids: The 1410/7010 Simulator for IBM System/360, C28-6528-1, and in the Programming section of the DP Sales Manual.

Reference Material: IBM System/360 Principles of Operation, A22-6810 ... IBM 1410 Principles of Operation, A22-0526.

Basic Program Material:

Documentation - Program Material List.

SRL Publication - IBM System/360 Conversion Aids: the 1410/7010 Simulator for IBM System/360, C28-6528-1.

Machine Readable: 9 track DTR or 7 track DTR (Data Conversion feature required) containing: Common Programs, SIM 10, PREP 10, UPDATE 10, SYSINEND, SAMPLE PROGRAM.

NOTE: When ordering this program, the requester must indicate whether a 9-track or 7-track DTR is required. If not specified, 9-track DTR will be supplied.

DTR will be supplied by the Program Information Department - no tape submittal is required.

[B] IBM System/360 7080 Simulator

The 7080 Simulator (360C-SI-751) may now be ordered. First shipments will begin the week ending September 2, 1966. It is a stand-alone System/360 program that, without additional hardware, enables programs that have been operating on a 7080 to be executed on any System/360 having a suitable configuration.

Programs for 705 Models I, II, and III can be run if they are compatible with the 7080. This usually requires running the programs in conjunction with INT580. However, 705 Model III programs that can be run without INT580 on the 7080 will run on the Simulator within the restraints of the Simulator support.

The Simulator produces correct results only for programs that work properly on the original system, and may produce incorrect results for time-dependent programs.

By eliminating the requirement to convert all 7080 programs, the Simulator allows the user to apply most of his programming resources toward developing new applications and redesigning existing applications to take full advantage of System/360 facilities. Use of the Simulator also eases the pressure of program testing.

The usefulness of the Simulator can be extended indefinitely, since simulation may prove to be more economical than reprogramming for programs which are run infrequently. The reprogramming task is eased by allowing its deferment until system installation and testing are complete.

Minimum System Requirements: The Simulator operates with the Standard Instruction Set and the Decimal Arithmetic option. Main storage requirements depend on the 7080 memory being simulated, as follows -

7080 Memory (characters)	System/360 Main Storage (bytes)
80,000	131,072 (Model G)
160,000	262,144 (Model H)

The System/360 must be equipped with the devices needed to service the Simulator, as well as those required to provide a configuration corresponding to that of the original system.

The Simulator requires:

. One 1052 Printer-Keyboard.
. One System/360 device for program input.
. One System/360 device for simulator control information input.
. One corresponding System/360 device for each simulated 7080 device.

If the Simulator Program is to be loaded from a magnetic tape unit equipped with the 7-track Read Write Head (#9557); the 7-track Compatibility feature (#7125) and the Data Conversion feature (#3228 or #3236) must be installed on the associated tape control unit. After the program has been loaded, this System/360 device is available for simulating a 7080 corresponding device. (See below) For each 7080 device simulated, one of the System/360 devices shown in the following table is also required. In some cases, the program input, control information input, and simulated 7080 device functions can be handled by the same System/360 device.

7080 Device	System/360 Device
7153 Console Control Unit, Model 1	1052 Printer-Keyboard (any model compatible with the system)
7502 Console Card Reader, Model 1	2540 Card Read Punch, Model 1 1442 Card Read Punch, Model N1 2501 Card Reader, Model B1 and B2 2520 Card Read Punch, Model B1
729 Magnetic Tape Units (any model)	2401, 2402, 2403 Magnetic Tape Units, Model 1, 2, or 3 (7- or 9-track)

(Note that Models 4, 5, and 6 of the 2400 series tape units cannot be used.)

Information on simulation limitations and performance under simulation can be found in the SRL publication, IBM System/360 Conversion Aids: The 7080 Simulator for IBM System/360, C28-6531, and in the Programming section of the DP Sales Manual.

Reference Material: IBM System/360 System Summary, A22-6810 ... IBM System/360 Principles of Operation, A22-6821 ... 7080 Principles of Operation, A22-6560.

To order the Simulator Program, refer to page P 1 of the Programming section of the DP Sales Manual.

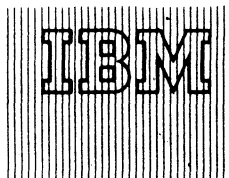Program Material:

Documentation - Program Material List.

SRL Publication - IBM System/360 Conversion Aids: The 7080 Simulator for IBM System/360, C28-6531-1.

Machine Readable - 7080 Simulator Object Program containing: Common Programs, SIM80, PREP80, UPDATE80, SYSINEND and the Sample Program may be obtained on one 9-track DTR or one 7-track DTR. When ordering, the requester must indicate whether 9-track or 7-track DTR is required. If not specified, 9-track DTR will be forwarded.

Note: DTRs will be supplied by the Program Information Department. No tape submittal is required.

These simulator programs are low usage items and should only be used in situations where their availability is essential. They should not be ordered for experimentation. These programs do add a level of complexity to the installation due to the basic process of simulating one computer on another. Field engineering assistance must be specifically arranged with the FE Branch. It is essential that the local FE Manager be advised of the planned usage of a simulator at an account.

G. R. Williamson
Director of DP Marketing

[A]   BPS/360 2311 Copy and Restore
            Utility Programs

Change of Commitment

The BPS/360 Copy Disk-to-Card and Restore Card-to-Disk utility programs announced in P66-56 are being modified to include a restart facility. This requires a change in availability date from August 31, 1966 to October 15, 1966. All affected customers must be notified immediately.

Announcement

A new BPS/360 Copy and Restore utility program, Disk-to-Disk, will be provided in addition to those announced in P66-56. It will perform the same functions announced in P66-56, with the exception that there will be no intermediate storage medium (card or tape) used. Availability -- August 31, 1966.

Minimum System Requirements: An 8K System/360 ... one Card Reader ... two 2311 Disk Drives ... one Printer or 1052 Printer-Keyboard for logging and error messages.

Supported devices include ... 1442, 2501, 2520, 2540 ... 1403, 1443, 1404 (continuous forms only) ... extra core storage is used to increase the maximum blocks per track read.

G. R. Williamson
Director of DP Marketing

[A] BPS/360 2311 Copy and Restore Utility Programs

Version 1 of two BPS/360 2311 Copy and Restore utility programs are now available. They are:

● Copy Disk to Tape and Restore Tape to Disk, 360P-UT-061

This program consists of two separate decks, one to copy a disk onto one or more tapes; and the other to restore a disk from the previous tapes. The program will copy and restore a disk in one of two ways:

. Copy and Restore Volume - with this option one entire disk pack is copied and restored, including RO, IPL Records, data records, VOLUME LABEL(s), and the VTOC.

. Copy and Restore File - with this option, one data file may be copied and restored. The file may consist of more than one volume. RO's are copied for the area occupied by the file, and IPL Records may be optionally copied.

The program assigns I/O areas based on the size of core storage. I/O overlap is performed if core storage is equal to or greater than 16K and channel assignment permits. The restored records occupy areas of the 2311 identical to the original file.

● Copy Disk-to-Disk, 360P-UT-072

This program consists of one deck that copies one disk to another. It performs the identical functions of 360P-UT-061, with the exception that there is no intermediate storage medium used. Two disk drives are required; files may not be copied from one area to another on the same pack.

Performance : The performance figures below are based on the following machine configurations:

8K System/360 Model 30.
2540 Card Read/Punch.
For 360P-UT-061, a printer (as described in Minimum System Requirements), one 2311 Disk Drive and one 2400 series 9-track magnetic tape drive (90KC), both attached to the Selector Channel.
For 360P-UT-072, two 2311 Disk Drives, both attached to the selector channel.

The figures are also based upon processing a 1316 Disk Pack on which each track contains 9 data records of 300 bytes each.

360P-UT-061

Copy Disk to Tape requires approximately 4 minutes if no errors occur.

Restore Tape to Disk requires approximately 5.5 minutes if no errors occur.

360P-UT-072

Approximately 4 minutes are required to copy disk to disk if no errors occur.

Usage Considerations

No Record ID (count field) may be repeated on a track.

RO must be written according to IBM standards. ($K_L = 0$, $D_L = 8$)

No ID (count field) other than RO may contain a record number indication of zero.

A file copied to tape on a machine size of 16K or greater cannot be restored to disk on a machine smaller than 16K.

1316 Disk Packs must have been initialized with standard home addresses, RO's and a Volume label, according to IBM standards. The disk pack may have been used between initialization and restoring a file from tape.

Minimum System Requirements

8,192 bytes of main storage.
A card reader (1442, 2501, 2520 model B1, or 2540) for program loading and control cards.
Appropriate input/output devices:
For 360P-UT-061 at least one 2311 and one 2400 series tape drive (if 7-track tape the Data Conversion Feature must be present).

For 360P-UT-072 two 2311's, one for input and one for output.

An IBM 1403, 1443, 1445 or 1404 (continuous forms only) printer or an IBM 1052 console printer for program logging and diagnostic messages.

Engineering Change Level Requirements: These programs have the same Engineering Change Level requirements as IBM System/360 Disk Operating System. These can be found on page 4 of Programming Announcement Letter P66-45, as amended by P66-73.

Reference Material: IBM System/360 Basic Programming Support, Programmer's Guide, C24-3354 ... IBM System/360 Basic Operating System, Programmer's Guide, C24-3372 ... IBM System/360 Principles of Operation, A22-6821.

For additional information concerning the BPS/360 2311 Copy and Restore utility programs, refer to P66-56 and P66-75.

Basic Program Material:

Copy Disk to Tape and Restore Tape to Disk, 360P-UT-061

Documentation: Program Material List

·SRLs: IBM System/360 Basic Programming Support DASD Utility Programs - Specifications, C24-3363-3 ... and TNLs N24-5095, N24-5106, and N24-5123 ... IBM System/360 Basic Programming Support DASD Utility Programs - Operating Guide, C24-3392-4 ... and TNLs N24-5096 and N24-5124.

Machine Readable Material: One 9-track DTR or one 7-track DTR (Data Conversion feature required) containing the Assembled Decks for Copy Disk to Tape and Restore Tape to Disk.

Copy Disk-to-Disk, 360P-UT-072

Documentation: Program Material List

SRLs: IBM System/360 Basic Programming Support DASD Utility Programs - Specifications, C24-3363-3 ... and TNLs N24-5095, N24-5106, N24-5123 ... IBM System/360 Basic Programming Support DASD Utility Programs - Operating Guide, C24-3392-4 ... and TNLs N24-5096 and N24-5124.

Machine Readable Material: The copy Disk to Disk Assembled Deck is available on one 9-track DTR, or one 7-track DTR (Data Conversion feature required) or in card form.

When ordering the requester must specify whether 9-track or 7-track DTR is required. If not specified, 9-track DTR will be forwarded.

Note: DTRs will be supplied by the Program Information Department -- no tape submittal is required.

[B] IBM 1130 Commercial Subroutine Package

The 1130 Commercial Subroutine Package (1130-SE-25X) is now available. It 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.

Description: 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:

. 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

Programming Systems: 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 1B 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 Description, H20-0221 ... Program Reference Manual (including operating instructions, listings, flow charts, narrative), H20-0241 ... Application Directory.

Machine Readable -- Source Decks and Sample Problem Decks.

Reference Material: "IBM 1130 FORTRAN" (C26-5933).

For further information contact the Systems Marketing Technique Development Department Product Programs, DPD HQ.

[C] **IBM 1130 Scientific Subroutine Package**

The IBM Scientific Subroutine Package (1130-CM-02X) for operation under the IBM 1130 Disk Monitor FORTRAN Compiler (1130-OS-001) may now be ordered. Shipments will begin the week ending September 16.

This program previously announced as available in August 1966 for operation under the IBM 1130 Card FORTRAN Compiler (1130-FO-001), will be available in December 1966.

SSP/1130 contains all of the subroutines presently available in SSP/360 (360A-CM-03X). It replaces the 1130 MATHPAK and will perform all of the computational functions originally specified in 1130 MATHPAK Announcement (P65-5).

Description: 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.

Use: As a library of subroutines, SSP/1130 allows the user to select those functions which he needs, while not being burdened with unneeded routines.

Programming Systems: The subroutines will compile and execute with the IBM 1130 Disk Monitor FORTRAN Compiler (1130-OS-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 I/O 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 using 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.

Special Sales Information: The Slide Presentation (V20-0120) for SSP/360 (360A-CM-03X) may be useful in selected sales situations. It should be noted that although the calling sequences of the subroutines are identical to those in SSP/360, there have been some modifications to the subroutines and sample programs. The difference in integer word length of the IBM 1130 and System/360 FORTRANs affects SSP subroutines RANDU and GAUSS.

In SSP/360, 2^{29} random numbers are produced by RANDU before the cycle repeats. In SSP/1130, this figure is 2^{13}. Because GAUSS uses RANDU, GAUSS also has a shorter cycle length. The sample programs for SSP/1130 have different I/O and FORMAT statements. In addition, the maximum data capacity has been reduced to fit into the 1130's 8K words of core.

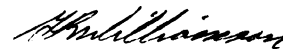**Basic Program Material:**

Documentation -- Application Directory, Application Description (H20-0225), Programmer's Manual (H20-0252).

Machine Readable -- Source program cards and sample program cards.

Optional Program Material: Systems Manual containing flowcharts for all subroutines in the package.

Reference Material: IBM 1130 FORTRAN Language (C26-5933).

For further information contact your District or Regional Scientific Marketing Representative.

G. R. Williamson
G. R. Williamson
Director of DP Marketing
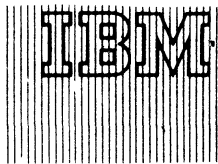
[A]   IBM Operating System/360

Components for OS/360 have been modified as follows:

Additional Features

The RPG scheduled for March 15, 1967 now includes the facilities for both Direct and Index Sequential Access Methods, and the ability to update in place and create new data sets.

Withdrawn Items

Support for these features is withdrawn:

1. The combined BISAM/QISAM facility and ISAM support of the Record Overflow feature.

2. Data Set Control facilities for additional User Volume Labels.

3. COBOL E Extended Source Program Library facility. (This facility will be available in the first release of COBOL F.)

Customers affected by these changes should be notified promptly.

[B]   BPS/360 Report Program Generator (Card)

Version 2 of BPS/360 Report Program Generator (Card), 360P-RG-200, is now available. In addition to incorporating corrections for miscellaneous program errors, Version 2 provides additional support:

. Sterling Subroutines.

. The 2520 Card Read Punch Model B1 may now be used to satisfy minimum system requirements for a card reader and/or card punch, and the 2520 Card Punch Models B2 and/or B3 to satisfy such requirements for a card punch. The 2520 cannot be used for a combined file.

The BPS/360 Report Program Generator (Card) is a program language and a processor program that is used to produce machine language object programs. The object programs will be used primarily to produce business reports, but the reports may range from a simple card-to-printer listing to a complete report that incorporates numerous calculations and editing.

Some of the capabilities of the language are:

. The object program can obtain data records from as many as three card-input files.

. The object program can match records in as many as three card files to govern processing of the report.

. Input records may be checked for sequence.

. The object program can search tables, and it can use data found in the tables to produce the report.

. Calculations may be performed on data taken from input records or RPG literals.

. The program can branch to a subroutine that has been written in a language other than RPG, perform calculations, and return to the RPG program.

. The report can be produced on as many as three printer or punch files.

Published by DP Sales Publishing Services, WTHQ

Machine Requirements: To generate an RPG object program, the following are the minimum machine requirements -- 8K bytes of main storage (up to 32K bytes of main storage may be utilized) ... card reader ... card punch (if object program card deck is desired) ... printer (if diagnostics are desired) ... Standard Instruction Set ... Decimal Arithmetic Feature.

To execute an RPG object program, the following are required -- 8K bytes of main storage (up to 32K bytes of main storage may be utilized) ... Standard Instruction Set ... Decimal Arithmetic Feature ... I/O units as required by the object program.

The following card I/O devices and printers are supported -- 1442 Card Read Punch ... 2501 Card Reader ... 2520 Card Read Punch, Model B1 ... 2520 Card Punch, Model B2 ... 2520 Card Punch, Model B3 ... 2540 Card Read Punch, Model 1 ... 1403 Printer ... 1404 Printer* ... 1443 Printer ... 1052 Printer-Keyboard.**

*The 1404 Printer may be utilized for continuous forms operations only.

**The 1052 may be used only as an output logging device.

Up to three card input devices and up to three card output devices or printers may be used in any combination.

The object program requires at least one card input device and one card output or printer device.

Basic Program Material:

Documentation -- Program Material List ... Sample Problem Description.

SRL Publications -- System/360 BPS Specifications, RPG - Card, C24-3374-1, and TNL N24-5052 ... System/360 BPS Operating Guide, RPG - Card, C24-3464-1.

Machine Readable -- RPG Non-Relocatable Assembled Deck and Sample Problem Source Program may be obtained on one 9-track DTR, or one 7-track DTR (Data Conversion feature required), or in card form.

When ordering this program, the requester must indicate whether 9-track DTR, 7-track DTR, or a card deck is required. If mode of shipment is not indicated, 9-track DTR will be forwarded.

Note: Current users will not receive the new version automatically. Instead, they will receive a prepunched Program Request Card and a letter announcing the new version and instructing them to order it through the local IBM Branch Office.

DTRs will be supplied by the Program Information Department - no tape submittal is required.

SEE REVERSE SIDE FOR "NOTE TO WORLD TRADE READERS".

G. R. Williamson
Director of DP Marketing

[A] IBM System/360 Disk Operating System

A major DOS/360 modification (System Release 4) providing corrections for miscellaneous APAR reported program errors is now available from PID.** The change levels of the program components associated with the modification are:

		Change Level
System Control and Basic IOCS	360N-CL-453	1-2
Consecutive Disk IOCS	360N-IO-455	1-1
Consecutive Tape IOCS	360N-IO-456	1-1
COBOL	360N-CB-452	1-1
COBOL DASD Macros	360N-CB-468	1-1
FORTRAN IV	360N-FO-451	1-2
Report Program Generator	360N-RG-460	1-1

Each DOS/360 customer presently on maintenance has been sent a letter highlighting the changes incorporated by the modification, along with detailed ordering procedures and a prepunched order card for the Control Program, 360N-CL-453. To receive the updated system, your customer has been instructed to secure Branch Office approval on the order card and forward a full width tested magnetic tape or 1316 Disk Pack to PID.

The updated tape or disk pack returned to your customer will contain all DOS/360 components. However, updated documentation will be provided only for those components for which your customer is now receiving maintenance.

If your customer wishes components beyond those which were originally ordered, an additional IBM Request Card must be submitted for each one. This card(s) must also be approved by the branch office and should accompany the prepunched order card for the Control Program.

Your customers should be encouraged to order this major modification immediately, since subsequent change levels will be based upon it.

The remaining components of DOS/360 are not affected by this modification. They are:

		Change Level
Direct Access Method	360N-IO-454	1-0
ISFM	360N-IO-457	1-0
Consecutive Paper Tape IOCS	360N-IO-458	1-0
Group 1 Utilities-UN. RECD/Disk	360N-UT-461	1-0
Group 2 Utilities-Tape	360N-UT-462	1-0
Group 3 Utilities-Data Cell	360N-UT-463	1-0
Sort/Merge-Disk	360N-SM-450	1-0
Sort/Merge-Tape	360N-SM-400	1-0
Assembler (Basic Modules)	360N-AS-465	1-0
Assembler (DWF Modules)	360N-AS-466	1-0
Assembler (TWF Modules)	360N-AS-467	1-0
Autotest	360N-PT-459 †	x-x

**System Release 4 incorporates no functional improvements or capabilities, nor does it provide additional hardware support.

†To be available from PID January 13, 1967 (See P66-82).

[B] OS/360 Dump/Restore, OS/360 Recover/Replace

Version 1 of the independent utilities OS/360 Dump/Restore, 360P-UT-214, and OS/360 Recover/Replace, 360P-UT-215, are now available as separate components. Dump/Restore dumps the data contents of a direct-access volume onto a 2311 disk storage volume or a magnetic tape and restores the data contents to a direct-access volume that resides on the same type device as the source volume. Recover/Replace attempts to read data from a bad track and, after the operator has corrected the data, replaces it on an alternate track of the direct-access device.

These programs are intended for the OS/360 user. Non-OS/360 users should not mistakenly order these as BPS utilities.

APARs should be sent to: APAR Processing, IBM Corporation, P. O. Box 390, Poughkeepsie, New York 12602.

Minimum System Requirements: A 32K System/360. For 360P-UT-214 a 2301 on the system requires 64K.

Basic Program Material for each program:

Documentation -- Program Material List.

SRL Publications -- IBM Operating System/360 Utility programs, C28-6586-2 and TNL N28-2156.

Machine Readable -- Object Deck available in cards, 9-track or 7track DTR (Data Conversion feature required).

When ordering these programs, the requester must indicate whether 9-track DTR, 7-track DTR, or a card deck is required. If mode of shipment is not indicated, 9-track DTR will be forwarded.

DTRs will be supplied by the Program Information Department - no tape submittal is required.

G. R. Williamson
Director of DP Marketing

[A] System/360 Model 40 1410/7010 Emulator Program

Version 3 of the System/360 Model 40 1410/7010 Emulator Program may now be ordered (360C-EU--728). Shipments are expected to begin the week ending December 2. It obsoletes Version 2 and provides the following improvements:

SUPPORT OF 2400-SERIES MODELS 4, 5, AND 6, AND 2415 MODELS 1-6

In addition to the previously supported tape units and controls, the Emulator Program now supports use of the 2401 and 2402 Magnetic Tape Units, Models 4, 5, and 6; 2403 Magnetic Tape Unit and Control, Models 4, 5, and 6; and 2415 Magnetic Tape Unit and Control, Models 1-6, for emulation of 729 tape drives.

SUPPORT OF 2501 CARD READER AND 2520 CARD READ PUNCH

In addition to the previously supported card reading equipment, the Emulator now supports the 2501 Card Reader, Models B1 and B2, and the 2520 Card Read Punch, Model B1, for emulation of the 1442 Card Read Punch.

DISK RESIDENCE

Users now have the option of writing the Emulator Program, as a loadable file, on 2302 Disk Storage or on a 2311 Disk Storage Drive.

7010 TAPE LOAD SWITCH

The 7010 Tape Load Switch function is now simulated; the function is initiated by depressing the L or "1" key on the 1052 Console.

The 1410/7010 Emulator Program is a stand-alone program which, with the 1410/7010 Compatibility Feature (#4478), executes 1410/7010 programs on a System/360 Model 40. The Emulator Program uses both standard System/360 instructions and special instructions provided by the Compatibility Feature. Combined, the Emulator Program and the Compatibility Feature are referred to as an Emulator. Currently operating non-time-dependent 1410/7010 programs can be executed by the Emulator without modification, although certain special and custom features are not emulated.

By eliminating the requirement to convert all 1410/7010 programs before installing System/360, the Emulator allows the user to apply most of his programming resources towards developing new applications and redesigning existing applications to take full advantage of System/360 facilities. Use of the Emulator also allows immediate production runs upon installation, allows time for user education in System/360 concepts, and eases the pressure of program testing.

The average internal speed of the Emulator (excluding I/O and Edit instructions) is approximately twice that of the 1410. Throughput performance depends on the mixture of instructions and the comparative performance of I/O devices. However, throughput for most jobs will be equal to or better than 1410 system throughput. Timing information which may be used to estimate throughput is presented in the SRL publication, System/360 Conversion Aids; The 1410/7010 Emulator Program for System/360 Model 40, C28-6563.

Note: The specified performance can be attained for disk systems only if Engineering Change Level 413140 is installed on 2841 Storage Control Units. Throughput with lower level 2841s may be reduced by as much as two-thirds.

The basic 1410/7010 configuration being emulated may include ten disk modules on each of two channels, ten tape units on each of two channels, punched card data processing on channel 1, and the 1415 Console Printer.

The Emulator appears to the 1410/7010 program as a 40K or 80K 1410/7010 with the following features: 1410/7010 Processing Overlap ... 1410/7010 Priority ... 1410 Dual Synchronizer Adapter ... 7010 Second Data Channel ... 7010 Store and Restore Status instructions.

In addition to the 1410/7010 Compatibility Feature (#4478), the System/360 requirements are: Model 40F for 40K positions of 1410/7010 core storage, or Model 40G or larger for 80K positions of 1410/7010 core storage ... Decimal Arithmetic Feature (#3237) ... one 1052 Printer-Keyboard, Model 7, and 1052 Adapter (#7920) ... one program-load unit which may be any of the following -- 2540 Card Read Punch, 1442 N1 Card Read Punch, 2501 B1 or B2 Card Reader, 2520 B1 Card Read Punch, 2400-series Magnetic Tape Unit, 2302 Disk Storage, 2311 Disk Storage Drive.

The program is released from PID in card-image form on a 7- or 9-track DTR. Loading of the Emulator Program, as distributed by PID, must be from card or tape. Subsequent loading can be from card, tape, or disk.

If the Emulator Program is to be loaded from a magnetic tape unit equipped with the 7-track Read-Write Head (#9557), the 7-track Compatibility feature (#7125, #7126, #7127) and the Data Conversion feature (#3228 or #3236) must be installed on the associated Tape Control Unit. After the Emulator Program has been loaded, the load device, except for the 2311, is available as a 1410/7010 corresponding device.

Input/Output Device Correspondence is as follows:

1410/7010 I/O Units	Equivalent System/360 Model 40 I/O Units
1402 Card Read Punch, Mdl 2*	2540 Card Read Punch
1442 Card Reader, Mdl 3*	1442 Card Read Punch, Mdl N1 2501 Card Reader, Mdl B1 or B2 2520 Card Read Punch, Mdl B1
1403 Printer, Mdl 1 2, or 3*	1403 Printer, Mdl 2 or N1 1404 Printer, Mdl 2
729 II, IV, V, and VI Magnetic Tape Units	2401, 2402, 2403, or 2415 Magnetic Tape Units, Mdl 1, 2, 3, 4, 5, or 6,** or 2404 Tape Units, Mdls 1, 2, or 3; 7- or 9-track
7330 Magnetic Tape Units	Same as for the 729 Magnetic Tape Units
1415 Console Printer	1052 Printer-Keyboard, Mdl 7 with printing element #9572
1301 Disk Storage - Model correspondence as follows: Two Model 1 One Model 2 Four Model 1 Two Model 2 Two Model 1 and one Model 2	2302 Disk Storage One Model 3 One Model 3 One Model 4 One Model 4 One Model 4

*Emulated punched card data processing must previously have been assigned to 1410/7010 channel 1.

**2401/2402/2403 Model 6s may be used on either selector channel 1 or 2, but not both simultaneously.

Input/Output Feature Correspondence is as follows:

1410/7010 Feature	Model 40 Feature
1402 51-Column Interchangeable Read Feed, Features #1013, #4150	2540 51-Column Interchangeable Read Feed, Feature #4151

Reference Material: The following reference publications are available through the IBM Branch Office -- System/360 System Summary, A22-6810 ... System/360 Principles of Operation, A22-6821 ... System/360 Basic Programming Support, Basic Utilities, C28-6505 ... System/360 Model 40 Operating Techniques ... 1410 Principles of Operation, A22-0526 ... 7010 Principles of Operation, A22-6726.

Basic Program Material:

Documentation -- program material list ... operating instructions for sample problem.

SRL Publications -- System/360 Conversion Aids: The 1410/7010 Emulator Program for System/360 Model 40, C28-6563-2, and TNL N27-1247 ... System/360 Basic Programming Support, Operating Guide for Basic Assembler and Utilities, C28-6557-2, and TNL N24-5136.

Machine Readable -- one distribution tape reel (DTR) either 9-track or 7-track, containing the Emulator object program, absolute loader, sample program and disk loader. Data Conversion feature required for 7-track users.

When ordering this tape, the requester must specify whether a 7-track or 9-track DTR is required. If not specified, a 9-track DTR will be forwarded.

DTRs will be supplied by PID, no tape submittal is required.

[B] 7040/7044 Emulator Program

Version 1 of the System/360 Model 65 7040/7044 Emulator Program, 360C-EU-733, is now available.

The 7040 series† Emulator Program is a stand alone program that executes 7040 series programs on a System/360 Model 65 equipped with the Compatibility Feature (#7119). The Emulator Program uses standard System/360 instructions and the special instructions provided by the Compatibility Feature. The Compatibility Feature is the feature that is added to a System/360 Model 65 to permit the execution of 7040 series programs. The Emulator Program and the Compatibility Feature combined are known as the Emulator. Refer to the "Engineering Change Considerations" section for a list of ECs that are prerequisites for use with the 7040/7044 Emulator Program.

The Emulator provides an efficient means of converting to System/360 by eliminating the necessity of converting all 7040 series programs before installing System/360. The Emulator allows the user to apply most of his programming resources toward developing new applications and redesigning existing applications to take full advantage of System/360 facilities.

A 32K 7040/7044 system with basic instruction set, extended performance set, single-precision floating-point, double-precision floating-point, and input/output instructions is emulated. Storage protection and the interval timer are optionally supported.

Most currently operating, non-time-dependent, 7040 series programs can be executed without modification, although certain special and custom features are not emulated.

The performance of the Emulator will vary according to the instructions used and the I/O activity of the emulated 7040 series program. The average internal speed of the Emulator, when executing non-I/O instructions, is approximately 1.4 times that of the 7044.

† "7040 series" is used collectively to refer to the 7040 and 7044, unless otherwise noted.

Throughput performance depends on the mixture of instructions and the comparative performance of equivalent I/O devices. However, throughput time for most jobs will be approximately equal to the throughput time on the 7044. Timing information that may be used to estimate throughput is presented in the publication, System/360 Conversion Aids: The 7040/7044 Emulator Program for the System/360 Model 65, C28-6585.

The basic machine requirement for using the Emulator is a System/360 Model 65 equipped with:

. At least 524,288 bytes of main storage.

. The 7040 Compatibility Feature (#7119).

. A 1052 Printer-Keyboard Model 7 with 1052 Adapter (#7920) or with 2150 Console.

. A 2400 series Magnetic Tape Unit (9-track, or 7-track with the Data Conversion Feature).

. Two additional 2400 series Magnetic Tape Units (or one 2400 unit and one of the following: 1442 Card Read Punch or 2540 Card Read Punch) for initialization purposes. However, card read-punch facilities must be available either on- or off-line. If a 7-track 2400 series Magnetic Tape Unit is used to contain the Edit file, the unit must be equipped with the Data Conversion Feature.

The following units are not presently supported by the Emulator Program; support for these devices will be announced at a later date. 2401 and 2402 Magnetic Tape Unit, Models 4, 5, and 6 ... 2403 Magnetic Tape Unit and Control, Models 4, 5, and 6 ... 2404 Magnetic Tape Unit and Control, Models 1, 2, and 3 ... 2501 Card Reader ... 2520 Card Read Punch ... 2803 Tape Control, Model 2 ... 2804 Tape Control, Models 1 and 2 ... 2870 Multiplexer Channel.

A variety of System/360 input/output devices may be used to emulate the 7040 series devices if the System/360 devices satisfy certain requirements. System/360 card read-punch units must be equipped with the Card Image Feature if the equivalent 7040 device has the Column Binary Feature. All tape drives used for 7-track tapes must be equipped with the 7-track Compatibility Feature.

Below are the System/360 units that may be used to emulate 7040 series units; however, as stated previously, certain of these units are not presently supported in this version of the Emulator.

7040 Units	System/360 Units
729 Tape Unit 7330 Tape Unit	2400 series Tape Unit
1402 Card Reader	2540 Card Read Punch 1442 Card Read Punch* 2501 Card Reader 2520 Card Read Punch*
1403 Printer Console Typewriter	1052 Printer-Keyboard** 1403 Printer** 1443 Printer**
1402 Card Punch	2540 Card Read Punch 1442 Card Read Punch*
1622 Card Punch	1442 Card Punch 2520 Card Read Punch* 2520 Card Punch

*The 1442 and the 2520 can be used to emulate either the 1402 reader or punch, but not both at the same time.

**The 1052, 1403, and the 1443 can be used to emulate the printer or the typewriter, but not both at the same time.

Input/Output devices are required for Emulator-Program residence, control-information input, message output, and console functions. Following are the System/360 units that may be used for each of the above-mentioned functions.

Emulator Function	Units
Emulator-Program Residence	2400 series Tape Units*
Control-Information Input	1052 Printer-Keyboard
	2400 series Tape Unit*
	2540 Card Read Punch
	1442 Card Read Punch
	2501 Card Reader
	2520 Card Read Punch
Message Output	1052 Printer-Keyboard
	1403 Printer
	1443 Printer
	2400 series Tape Unit
Console Functions	1052 Printer-Keyboard

*If 7-track, the Data Conversion Feature is required.

Note: These units need not be in addition to the units previously mentioned above. Also, the 1052 may concurrently perform more than one Emulator function.

Reference Material: System/360 System Summary, A22-6810 ... System/360 Principles of Operation, A22-6821 ... 7040 Principles of Operation, A22-6649 ... System/360 Special Feature Description 709/7040/7044/7090/7094/7094II Compatibility Feature for System/360 Model 65, A27-2715 ... System/360 Basic Programming Support Programmer's Guide (8K Tape), C24-3354 ... System/360 Basic Programming Support Operating Guide: Basic Tape System (8K), C24-3391.

Engineering Change Considerations

1. Engineering Change number 705256 with Requests for Engineering Action number 14492 is a prerequisite for use with the 7040/7044 Emulator Program.

2. The interval time updating accuracy may be affected unless Engineering Change number 705234 is installed.

Note: The above items apply only to System/360 Model 65s shipped prior to October 1, 1966. Installations that require any of these Engineering Changes should notify Field Engineering Technical Operations, Kingston, N. Y.

Restriction: In most cases, memory protect traps are delayed for one 7040 instruction cycle. This restriction will be removed the second quarter of 1967.

Basic Program Material:

Documentation -- program material list.

SRL Publications -- 7040/7044 Emulator Program for the System/360 Model 65, C28-6585-1.

Machine Readable -- 7040 Emulator Object Program, Initialization Deck, Sample Program and the Emulator Initialization Object Program may be obtained on one 9-track or 7-track DTR (Data Conversion feature required).

When ordering, the requester must specify whether 9-track or 7-track DTR is required. If not specified, 9-track DTR will be forwarded.

[C] OS/360

The minimum main storage requirement of OS/360 COBOL F has been redefined as 80K. Evaluations of programs which included use of COBOL F facilities such as report writer indicated that the previous 64K level imposed severe program size restrictions. The minimum CPU size required for OS/360 COBOL F is still 131,072 bytes (model G).

The availability of OS/360 program support for Dual Density 800-1600 BPI (#3471, #3472) on 2400 Magnetic Tape Units models 4, 5, and 6 has been changed from December 30, 1966 to March 15, 1967.

John Fahey
Director of DP Marketing

Note to World Trade Readers

This letter is a reprint of an IBM Programming Announcement made in the USA. The following changes, when appropriate, should be applied to the text for WTC use.

[1] All programs announced as available have been shipped to the appropriate WT Program Libraries. Programs and associated material may be ordered as indicated on pages 13 through 17, Programming Section, WT DP Sales Manual.

[2] Advance copies of the form numbered publications mentioned in the above either have been shipped (with additional copies available from the IBM Distribution Center, Mechanicsburg, Pennsylvania) or will be shipped when available. In the case of the latter, availability will be announced in the Weekly DP Marketing Publications Release Letter.

[3] When a new version of a program is announced current users must order it; they will not receive it automatically nor will they necessarily receive a prepunched request card in their Area.

[4] If DTR distribution is indicated in the above, program distribution media may be different in your area based on local conditions.

[5] All references made to the Program Information Department [PID] should be understood to mean the appropriate WT Program Library.

[6] Any reference made to DPD Departments as sources of information or for manuals etc. should be understood to mean the comparable WT Department.

[A] IBM 1130 Type Composition Program

The 1130 Type Composition Program (1130-DP-04X) and the 1130 TCP 8-Channel Paper Tape Skeleton Monitor Program (1130-DP-06X) may now be ordered. Delivery is scheduled to begin the week ending December 2. 1130-DP-04X should be ordered for card systems. Both 1130-DP-04X and the 1130-DP-06X must be ordered for 8-Channel paper tape systems.

The 1130 Type Composition Program extends the speed and flexibility of a digital computer into the composing rooms of the printing industry. Type compositors can use this program to provide significant time savings in transcribing textual material into a form required by linecasting machines for setting type.

Description: The program is designed to allow computer acceptance of perforated paper tape, containing the copy to appear in print and instructions pertaining to a desired printing format, from which a tape suitable for controlling the operations of a linecasting machine is produced and allocated to the proper point in the composing room. The output tape contains the original copy in the form of properly justified lines arranged according to the stylistic and graphic requirements described by the user with the format instructions. The programs are capable of producing justified lines in any format within the inherent limitations of the linecasting machine.

Features:

. Printer-oriented format control language which does not require extensive knowledge of type composition techniques.

. Controllable style limited only by inherent limitations of linecasting machine.

. Consistent graphic quality.

. 1130 Disk Storage offers automatic access to a large number of type fonts and hyphenation exception words.

. Up to 16 input readers and 16 output punches can be accommodated on the system.

. Program controlled polling of input readers.

. Program controlled selection of output punch based on font and column width required permits automatic allocation of output tapes.

. Extensive error detection and recovery procedures.

. Systems Installation Workbook and several utility programs to aid the user in gathering and loading information concerning user's operation.

Use: Printing organizations that use paper tape operated linecasting machines in composing type are potential users of this program. Tape perforator operators will now prepare tape for input to the computer instead of the linecasting machine. Since the computer assumes the burden of all justification decisions, hyphenation decisions, and the insertion of proper linecasting machine control functions, the operators can now concentrate on speed and accuracy of copy perforation with resulting benefits in total type composition speed.

Customer Responsibilities: To produce a functioning system the user must gather and incorporate into the system detailed linecaster descriptions and factors relating to the user's method of operation and stylistic requirements. A Systems Installation Workbook has been provided to enable the user to gather the required information in a systematic and complete fashion. A series of utility programs are provided for loading this data into the system in the required form. The workbook and utility programs greatly increase the speed and ease with which the user produces a functioning system.

Customers that use 8-channel paper tape systems must load and/or assemble their programs and installation dependent data on a system equipped with a card reader and a disk drive following system generation procedures specified for the card system (1130-DP-04X). The system's cartridge is then transferred to the customer's paper tape oriented system for operation, using the 8-channel paper tape Skeleton Monitor (1130-DP-06X) for system initialization.

Programming Systems: 1130 Assembler Language

Minimum Systems Requirements:

For the 1130-DP-04X -- An 1131 Processor Model 2B with 2315 Disk Cartridge ... 1442 Card Read Punch Model 6 or 7 ... Typesetting RPQs listed below.

CONTENTS

1130 Type Composition Program (1130-DP-04X and 1130-DP-06X) ... application program now available. [A]

Correction to P66-99 ... correction to be made in the contents section. [B]

System/360 Model 40, 1410/7010 Emulator (360C-EU-728) ... additional ordering instructions. [C]

———— Published by DP Sales Publishing Services, WTHQ ————

For the 1130-DP-06X -- An 1131 Processor Model 2B with 2315 Disk Cartridge ... 1134 Paper Tape Reader ... 1055 Paper Tape Punch ... Typesetting RPQs listed below.

1130-DP-04X and 1130-DP-06X Typesetting RPQs

The following RPQs for user-provided 6-channel advanced feed hole paper tape readers (PTRs)* and paper tape punches (PTPs)* are required.

RPQ 834398   Basic interface (required to attach any number of PTRs and PTPs).

RPQ 834399   Paper Tape Attachment (required to attach any number of PTRs and PTPs).

For more than one PTR and PTP --

RPQ 834400   Interface Expander (required to attach PTR numbers 2 through 8 and/or PTP numbers 2 through 8).

RPQ E36610   Second Interface Expander (required to attach PTR numbers 9 through 16 and/or PTP numbers 9 through 16).

RPQ 834401   Additional PTR Interface (one required for each PTR numbers 2 through 16).

RPQ 834402   Additional PTP Interface (one required for each PTP numbers 2 through 16).

*A maximum of sixteen PTRs and sixteen PTPs may be attached.

Basic Program Material for 1130-DP-04X

24 Core Image card decks ... 1 Relocatable Card Deck ... Hyphenation Exception Words Card Deck ... Application Directory ... Application Description Manual, H20-0139-1 .... Programmers Manual, H20-0287 .... Operators Manual, H20-0288. Systems Manual, H20-0289.

Basic Program Material for 1130-DP-06X

1 Core Image Paper tape ... Application Directory

Note: When ordering 1130-DP-06X, the user must also order the Basic Program material for 1130-DP-04X.

Optional Program Material for both 1130-DP-04X & 1130-DP-06X

The Optional Material is common to both 1130-DP-04X and 1130-DP-06X and consists of: 18 Source Card Decks available on a 9- or 7-track (Data Conversion feature required) 2400' magnetic tape.

For further information contact the Regional Printing and Publishing Industry Representative.

[B] Correction to P66-99

First item in contents box (TPAD) should read: IBM Confidential Application Program to be available at Field System Centers 4Q 1967.

[C] IBM System/360 Model 40 1410/7010 Emulator Program

Additional ordering instructions.

The following statement was omitted from P66-104, Item [A].

Current users will receive a prepunched request card and a letter instructing them to order Version 3 (360C-EU-728) through the branch office. This prepunched Program Request Card must be used to order the program.

John Fahey
Director of DP Marketing

[A] BPS/360 800/1600 BPI 2400 Series Tape Unit Support

DP Letter 266-34 stated that BPS/360 800/1600 BPI support for 2400 Series Tape Units would be available November 30, 1966.

Due to the workloads involved in processing the 25 affected programs through the final phases of the release cycle, some programs will not be available until after November 30, 1966.

For planning purposes, any program not supported by November 30, 1966, will be supported by December 16, 1966.

Customers affected by the change should be notified promptly.

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CONTENTS

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[B] System/360 Tape Overlap Emulator for Model 30 with 1401/1440/1460 Compatibility Feature

The engineering change levels required for proper functioning of the Tape Overlap Emulator Program, 360C-EU-097, are:

For one selector channel configurations

2030 Microprogram level	128054
1400 Compatibility Feature Microprogram level	128115
2030 Hardware Logic level	126741

For two selector channel configurations

2030 Microprogram level	128054
1400 Compatibility Feature Microprogram level	128115
2030 Hardware Logic level	126741

For two selector channel configurations with 2404 or 2804 Tape Control Unit (simultaneous read-while-write).

2030 Microprogram level	128054
1400 Compatibility Feature Microprogram level	128115
2030 Hardware Logic level	126741

These engineering change level requirements are indicated in the FE RETAIN file* TOEP program basic record. They will also be indicated in a revision to FE Program Announcement 4, System/360 Conversion Programs, IBM Customer Engineers Memorandum. This revision will be published shortly. All of the changes have been shipped and should now be available for field installation on systems that require them.

Questions regarding the above engineering change levels and/or the problems that may be corrected by them should be directed to the servicing FE branch office.

The Tape Overlap Emulator Program engineering change level requirements stated in P66-43 are no longer current.

Prior P-Letter references to this program are ... P65-9, P66-4, and P66-43.

*RETAIN messages, transmitted to ITPS terminals at FE and DP branch offices and support locations, include APAR responses and other programming systems information, updated on a daily basis, until that information is published in a Programming Systems Memorandum (see P66-81).

[C] DOS/360 Sort/Merge - Tape (Disk Resident)

TNL N21-5021 revising System/360 Disk and Tape Operating Systems, Tape Sort/Merge Program Specifications, C24-3438-1, states without qualification that an alternate work drive may now be specified, enabling the sort program to approximately double the maximum file size previously allowed.

This capability is presently available only in the TOS/360 Sort/Merge program, 360M-SM-400. It will not become available in the DOS/360 Sort/Merge - Tape (Disk Resident) program, 360N-SM-400, until November 30, 1966.
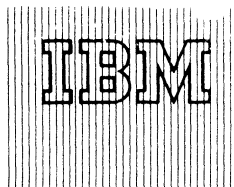
John Fahey
Director of DP Marketing

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Note to World Trade Readers

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[A]   System/360 Data Conversion and Label Processing Subroutines, Version 2

System/360 Data Conversion and Label Processing Subroutines, Version 2, (360A-SE-23X), supersedes Version 1 announced in P66-89 and is now available. Shipments will begin the week of December 12. These subroutines enable a user to process current system tape and card files on the System/360. Version 2 contains the same subroutines as Version 1 for operation under TOS/360 or DOS/360, plus additional routines for operation under OS/360.

Description: The Data Conversion and Label Processing Subroutines, Version 2, provide character translation from one character set to another character set. They also provide conversion for floating point, binary, zoned decimal, packed decimal and double digit numbers. Conversion subroutines operate on current system number representations to produce System/360 number representations and also perform the reverse conversions, i.e., System/360 representations to current system representations. The label processing subroutines perform reading and checking of current system standard IBM labels. They will also generate and write current system standard IBM labels.

Data files from the following current systems may be processed:

    1401, 1440, 1460, 1410, 7010
    1620
    705, 7080
    7070, 7072, 7074
    7040, 7044, 7090, 7094

Features:

    .   Allows user to continue to process current systems files
         alone or mixed with System/360 files on a System/360.

    .   Provides facility for file interchange between current
         system and System/360.

Use: Typical use of these subroutines might involve the gradual conversion of a large current system application to the System/360, wherein one or more data files must be shared between the two computers.

The data conversion subroutines may be called by Assembly Language, COBOL, or FORTRAN call statements. The label processing subroutines are implemented for usage at the non-standard label exits of TOS/360 and DOS/360 Logical IOCS, and the non-standard label exit of OS/360.

Customer Responsibilities: Reading and writing are responsibilities of the user (with the exception of label processing) since the data and character transformation performed by these subroutines is done with data as it appears in storage.

Programming Systems: The subroutines are written in either System/360 Assembly Language or E Level COBOL. The subroutines may be assembled or compiled and entered into the TOS/360 or DOS/360 or OS/360 subroutine library.

Minimum System Requirements: The minimum system requirements are the same as the minimum system configuration for the operating system that is used. The label processing subroutines require at least one 2400 Magnetic Tape Unit with the 7-track compatibility feature, and the floating point subroutines require the floating point instruction set. The label routines require the decimal arithmetic feature.

Program Material:

Basic

    Application Directory ... Program Reference Manual (H20-0319)
    contains Application Description, User's and Operator's Information
    ... the source and object decks may be obtained on one 9-track or
    one 7-track DTR (Data Conversion feature required).

    Note: DTRs will be supplied by the PID; no tape submittal is required.

Optional

    One 9-track or 7-track tape containing listings and flowcharts.
    The requester may forward or order magnetic tape in accordance
    with the current ordering procedures as described in the DP Sales
    Activity Section of the IBM Branch Office Manual.

Current users of System/360 Data Conversion and Label Processing

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Subroutines, Version 1, will receive a prepunched request card and a letter announcing the availability of Version 2 instructing them to order it through the branch office. Current users must use this prepunched program request card to order Version 2.

Orders for basic documentation only for this program will not be accepted at PID. Form numbered manuals should be ordered through the normal publication distribution channels.

For further information contact Systems Marketing Technique Development, DPD HQ.

[B]   System/360 Data Conversion Utility III, Version 2

Data Conversion Utility III, Version 2 (360A-SE-26X) may now be ordered. Shipments will begin the week of December 12. The IBM System/360 Data Conversion Utility III provides an effective and flexible capability for customers to convert their current IBM system data files to System/360 data sets. This general purpose utility program accepts, as input, data sets in the format of the IBM 1620, 1400, and 7000 series systems and produces as output the data format desired for System/360. The program accepts card, tape, or DASD data sets from the above IBM systems (where IBM written DUMP or UNLOAD routines have been used when coming from a current IBM system DASD) and writes these data sets on System/360 tape or DASD units. The program has data transformation capability that allows the user flexibility in "resystematizing" his data sets for System/360.

Data Conversion Utility III, Version 2 supersedes Version 1 announced in P66-89. It operates under TOS/360 and DOS/360 and contains the same routines as Version 1, plus additional routines which will provide output onto System/360 DASD units when operating under DOS/360.

The Data Conversion Utility III program accommodates the three general considerations in data conversions:

    1.   The physical characteristics of the I/O device (i.e., 7-track
         tape format, delta mode change character).

    2.   Current IBM systems software standards (i.e., labels, padding
         characters, checkpoint records, etc.).

    3.   Optimization of data representation (i.e., floating point, binary
         packed decimal, etc.).

Description: Data Conversion Utility III is a set of interdependent macro definitions which may be generated in a variety of ways to create specific data conversion programs that meet the exact requirements of the user's data set. The program is divided into two steps:

Step 1:   Assembling and generating a program

The parameters of the macro statements are used to specify the characteristics of the user's data file to be converted and the form of the converted output. The macro statements are then assembled and the resulting object modules are then combined to form a data conversion processing task in loadable form.

The specific data conversion required on a data set is indicated by macro parameters as follows --

INPUT	Specific description of the current IBM system input data set. (record form, type of tape labels, record length, block length...).
MOVE/TRANSFORM	Relative location, size, and type of input field and its corresponding output field's relative location, size, and type.
OUTPUT	Specific description of the System/360 output data set (record form ...).

———————Side 1 of 2

USER   Specifies exits in the program that are
                        to be activated and the name of the user's
                        task to which the program is to pass con-
                        trol when the exit is taken.

Step 2: Performing the Data Conversion

The second step can execute the following four functions as originally
specified in the macro statements.

1. Input of Current IBM System Data

    IBM standard label checking (80, 84, and 120 character labels)

    Checkpoint elimination

    BCD fixed length tape records (with or without padding)

    BCD variable length tape records (14XX/7080)

    7070/7074 Tape form 1, 2, 3

    7040/7090 Binary or mixed mode tape

    1620/14XX DASD cards

    Card data files
    Code conversion of dual special characters

2. Performing Move/Transform String Operations

    The Move/Transform Strings can be used for multiple record
    types or to combine multiple records from the input data set
    into one output data record.

3. Output to System/360 Data Sets

    Fixed length tape records (7- or 9-track)
    Fixed length DASD records
    Variable length tape records (7- or 9-track)
    Variable length DASD records

4. Executing User Modules

    User routines as required (e.g., non-standard tape labels ...).

    User exits are provided for such situations as non-standard
    current system labels on input. When user tasks are indicated,
    the user task(s) and the data conversion program will reside
    in storage together.

Features:

.   The IBM System/360 users are provided a facility to reduce
    substantially the difficulties, time, and costs of performing
    the required data conversions.

.   Allows greater flexibility for scheduling user manpower in
    new application areas where potential savings can be made.
    More of the manpower can be concentrated on the solution
    to the application problem, rather than the nature of the data.

.   Encourages the user to write his IBM System/360 application
    programs using record organization and data formats which
    are optimum for the IBM System/360.

.   Encompasses the requirements of current IBM system users,
    regardless of the machine size and configuration.

.   Provides comparable data conversion facilities to users, regard-
    less of the IBM System/360 language used.

.   Designed for ease of user implementation.

.   Allows the user to readily change his data storage media.

.   Designed to allow the user to tailor the program to his
    individual requirements through user exits and modular
    program organization.

Use: Data Conversion Utility III, Version 2, runs under control of TOS/
360 or DOS/360. The program can be used for the permanent conver-
sion of current IBM system data sets into System/360 data sets and can
also be used to obtain "live" test data from current IBM systems for use
in testing System/360 application programs. Since input data may be
on 7- or 9-track tape, customers whose initial conversion to System/
360 is planned around emulation will be able to use the Data Conver-
sion Utility III program to convert their even parity, BCD 9-track emu-
lator data sets when they convert their programs to System/360.

Customer Responsibilities: The macro definitions which make up the
Data Conversion Utility III program package must be cataloged in the
user's Source Statement Library. The user then writes the necessary

DCU III macro statements (and user routines if required) to specify the de-
sired data conversion program.

Programming Systems: The IBM System/360 Data Conversion Utility
III program is written in TOS/360 and DOS/360 Macro Language as
described in C24-3414. It is designed to run under control of TOS/
360 or DOS/360.

The following Utility programs will be required to prepare the supplied
program material: for TOS/360 users, 360M-UT-403 ... for DOS/
360 users, 360N-UT-462.

Machine Configuration: An IBM System/360, Model D30 (16K), with
the Decimal Arithmetic Feature.

The TOS/360, DOS/360 requirements of devices for system operation
and program assembly are necessary for generating a data conversion
utility program. The created data conversion program requires the nec-
essary devices for system operation, and in addition, input/output de-
vices as required for the data sets are needed as follows:

    One 2400 series tape drive for the input data set.
    2540/2501 for 1620/14XX DASD or other data card input.
    One 2400 series tape drive for the output data set.
    One DASD device for the output data set.

Note: 2400 series tape drives can be 9-track unless they interface
        with 729 tape drives, in which case the 7-track head and 7-
        track feature are required.

Program Material:

Documentation:

    Programmer's Manual, H20-0285 ... Operator's Manual, H20-
    0286 ... Application Directory.

Machine Readable:

    Control cards and macro definition cards may be obtained on one 9-
    track or 7-track DTR (Data Conversion feature required). Indicate
    whether 9-track or 7-track is required. If not specified, 9-track DTR
    will be forwarded.

    DTR's will be supplied by the Program Information Department; no tape
    submittal is required.

Current users of Data Conversion Utility III, Version 1, receive a pre-
punched request card and a letter announcing the availability of Version
2 instructing them to order it through the branch office. Current users
must use this prepunched program request card to order Version 2.

Reference Material:

    Application Description, H20-0194-1 -- now available from Dis-
    tribution Center.... Systems Manual, Y20-0042 -- availability from
    Distribution Center to be announced in a Publication Release Letter.

Orders for basic documentation only for this program will not be accepted
at PID. Form numbered manuals should be ordered through the normal
publication distribution channels.

For further information contact Systems Marketing Technique Develop-
ment, DPD HQ.

                                    John Fahey
                                    Director of DP Marketing

——————— Published by DP Sales Publishing Services, WTHQ ———————

[A]   System/360 Emulators

Emulator programs support for phase encoded magnetic tape drives will be provided according to the following schedule:

	2401 Mdls 4,5,6	2402 Mdls 4,5,6	2403 Mdls 4,5,6	2404 Mdls 1,2,3	2803/2804 Mdl 2	2415 Mdls 4,5,6	Availability
1401/1440/1460 Mdl 30*	X	X	X	X	X	X	2/15/67
1401/1460 Mdl 40	X	X	X	X	X	X	Available
1410/7010 Mdl 40**	X	X	X	X	X	X	Available
1410/7010 Mdl 50	X	X	X	C	X	X	12/30/66
7070/7074 Mdl 50	X	X	X	C	X	X	12/15/66
7040/7044 Mdl 65	X	X	X	X	X	***	2/15/67
7070/7074 Mdl 65	X	X	X	C	X	***	12/15/66
7080 Mdl 65	X	X	X	X	X	***	12/30/66
709/7090/7094 7094II Mdl 65	X	X	X	X	X	***	2/15/67

*   Model 6 tape drives cannot be used by the compatibility feature.

**   Model 6 tape drives can be used on selector channels 1 and 2, but not both simultaneously.

***   Support will be announced at a later date.

C   Currently supported

These emulator programs support include support for the following magnetic tape unit and tape control unit features:

    Dual Density (#3471, #3472)
    9-track Compatibility (#5320, #5321)
    7- and 9-track Compatibility (#7135, #7136)
    Mode Compatibility (#5121, #5122)

[B] IBM 1130 Type Composition Program

Correction to P66-107, item [A].

The Application Description Manual (H20-0139-1) is not Basic Program Material. This manual should be listed as Reference Material (available from the IBM Distribution Center, Mechanicsburg). Also, the form number listed for the Systems Manual (H20-0289) is incorrect and should read ... Systems Manual Volume I, Y20-0040 and Volume II, Y20-0041.

[C] BOS/360

The 2400 Magnetic Tape Dual Density (800-1600 bpi) support for BOS/360 will be available December 9 instead of November 30. This delay is caused by the heavy workload involved in final processing.
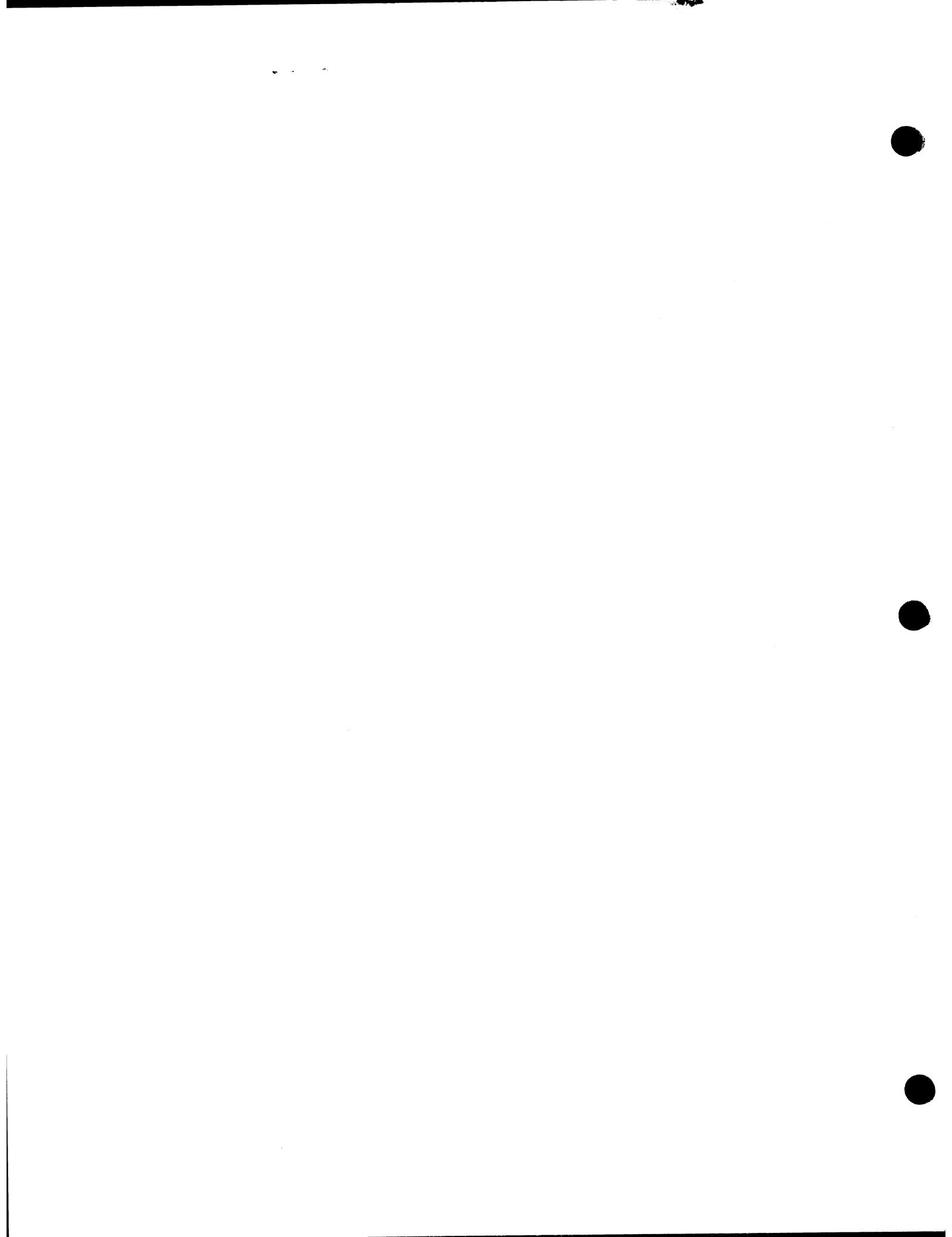
Customers affected must be notified.

John Fahey
Director of DP Marketing

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This letter is a reprint of an IBM Programming Announcement made in the USA. The following changes, when appropriate, should be applied to the text for WTC use.

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[2] Advance copies of the form numbered publications mentioned in the above either have been shipped (with additional copies available from the IBM Distribution Center, Mechanicsburg, Pennsylvania) or will be shipped when available. In the case of the latter, availability will be announced in the Weekly DP Marketing Publications Release Letter.

[3] When a new version of a program is announced current users must order it; they will not receive it automatically nor will they necessarily receive a prepunched request card in their Area.

[4] If DTR distribution is indicated in the above, program distribution media may be different in your area based on local conditions.

[5] All references made to the Program Information Department [PID] should be understood to mean the appropriate WT Program Library.

[6] Any reference made to DPD Departments as sources of information or for manuals etc. should be understood to mean the comparable WT Department.

[A] IBM BPS/360 Autotest (Tape)

Version 2 of BPS/360 Autotest (Tape), 360P-PT-045, is now available. It incorporates the following improvement:

> 2400 Series Magnetic Tape Units, Models 4, 5, and 6, are now supported in the Supervisor and Job Control used for building the Autotest System Tape, and in Job Control on the Autotest System Tape.

The program description and minimum system requirements in prior announcements (P65-32, P66-19, and P66-56) are still current.

Program Material

Documentation - Program Material List

Orders for the basic documentation only will not be accepted for this program at PID. Form numbered manuals should be ordered through Mechanicsburg.

SRL's - IBM System/360 Programming Support Autotest Specifications - 8K-Tape, C24-3343-2 and TNL N21-5025*, -- IBM System/360 Basic Programming Support Operating Guide Autotest - 8K Tape, C24-3417-2 and TNL N21-5026*. *New Items Added.

Machine Readable - Program Decks and Sample Decks may be obtained on one 9-track or 7-track DTR (Data Conversion feature required). When ordering the requester must indicate whether a 9-track or 7-track DTR is required. If not specified, a 9-track DTR will be forwarded.

Current users will not receive the new version automatically. Instead, they will receive a prepunched order card and a letter announcing the new version and instructing them to order it through the branch office.

DTRs will be supplied by PID - no tape submittal is required.

[B] BPS/360 Multiple Utility

PID is now distributing Modification Level 2 of Version 2 of the BPS/360 Multiple Utility, 360P-UT-055.

This modification includes the following improvement:

> 2400 Series Magnetic Tape Units, Models 4, 5, and 6 may now be used as input and/or output devices. The Job Control phase of the program recognizes a fourth operand in the ASSGN card for 9-track assignments. This operand causes tapes to be set to either 800 or 1600 bpi. The two possible operands are X'C8' to generate 800 bpi tapes or X'C0' to generate 1600 bpi tapes. If no fourth operand is specified, X'C8' (800 bpi) is assumed. For input tapes and with Models 4, 5, or 6 without the Dual Density feature, a Not Capable bit is set if a tape other than 1600 bpi is read. This bit is diagnosed by the program and the tape rewound and unloaded.

New publications that go with the modification to the user are:

IBM System/360 Basic Programming Support Specifications - Card and Tape Utility Programs, C24-5027-2 and its TNLs N21-5037, and N21-5031 ... TNL N21-5030, IBM System/360 Basic Programming Support Operating Guide - Card and Tape Utility Programs, C24-5026-1.

The availability of Version 2 was announced in P66-6. Other references are P66-33 and P66-100.

[C] System/360 Operating System (OS/360)

Additional information and an availability date for SORT checkpoint was not provided during November as planned. Technical data and schedules are being developed and new availability dates will be provided.

Customers affected by this notice must be notified promptly.

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[D] System/360 Basic Programming Support Basic Tape System

Modification Level 9 of the Basic Programming Support, Basic Tape System, 360P-AS-091, is now being distributed by PID. In addition to providing corrections for APAR reported errors, it includes:

800/1600 BPI Dual Density Support for 2400 Series Magnetic Tape Units

The initial release of 800/1600 BPI Dual Density Support is included in the Modification Level. All tape files presently recorded in 800 BPI can be run without alteration on drives having the Dual Density feature. The density to be used for a particular Magnetic Tape Unit will be determined by the "Device" operand of the // ASSGN card for that Magnetic Tape Unit. C8 will be used to indicate 800 bpi, and C0 will indicate 1600 bpi. If the "Device" operand is omitted from the // ASSGN card, a density of 800 bpi will be assumed. See page 25 of System/360 Basic Programming Support, Basic Tape System Programmers Guide, C24-3354-4, as modified by TNL N24-5163.

Minimum System Requirements: In addition to the minimum system requirements listed on page 5 of System/360 Basic Programming Support, Basic Tape System Programmers Guide, C24-3354, as modified by TNL N24-5119, at least one of the following is required: 2401 or 2402 Magnetic Tape Unit, Model 4, 5, or 6, and 2803 or 2804 Tape Control, Model 2 ... 2403 Magnetic Tape Unit and Control, Model 4, 5, or 6 ... 2415 Magnetic Tape Unit and Control, Model 4, 5, or 6.

Basic Program Material

Documentation - Program Material List and Sample Problem Operation Instructions.

Orders for the basic documentation only will not be accepted for this program at PID. Form numbered manuals should be ordered through Mechanicsburg.

SRL's - IBM System/360 Basic Programming Support, Programmers Guide, 8K Tape, C24-3354-4 and TNLs N24-5102, N24-5114, N24-5119, N24-5143, N24-5163 ... IBM System/360 Basic Programming Support, Assembler with Input/Output Macros, 8K Tape, C24-3355-4 and TNLs N24-5112, N24-5118, N24-5144, N24-5167 ... IBM Basic Operating System/360 and IBM System/360 Basic Programming Support Macro Definition Language, 8K Disk/Tape, C24-3364-3 ... IBM System/360 Basic Programming Support, Operating Guide, Basic Tape System, 8K, C24-3391-1, and TNLs N24-5083, N24-5115, N24-5162.

Machine Readable - 8K Assembler, IOCS/System Control available on a 9-track DTR.

DTRs will be supplied by PID - no tape submittal is required.

The material associated with this modification is currently forwarded to all current users.

[E] BPS/360 Sort/Merge Programs

PID is now distributing Modification Level 4 of Version 3 to all registered users of the following programs:

BPS/360 Sort/Merge (1-Channel), 360P-SM-043
BPS/360 Sort/Merge (2-Channel), 360P-SM-044

Each modification incorporates support for 2400 Series Magnetic Tape Units, Models 4, 5, and 6 (1600 bpi), including the Dual Density Special Feature. Corrections for miscellaneous APAR reported errors are also included.

New publications that go with the modification to the user are:

. TNL N21-5028 to IBM System/360 Basic Programming Support, Sort/Merge Program Specification, C24-3320-5

. TNL N21-5029 to IBM System/360 Basic Programming Support, Sort/Merge Program Operating Guide, C24-3413-1

The availability of Version 3 of each program was announced in P66-43. Other references are P66-65 and P66-102.

[F] 1130 Continuous System Modeling Program (1130 CSMP)

This application program (1130-CX-13X) is now available. It provides engineers and scientists with a simple, but versatile tool for solving dynamic system simulation problems. For many problems, this program obviates the need to use an analog computer facility.

Description: The 1130 CSMP is a "digital analog simulator" program using a block-oriented input language in which the functional blocks represent the elements and organization of an analog computer. A total of 25 standard functional blocks plus the ability to define special functions are provided. The continuous system model may be developed and tested, and results observed in an on-line interactive mode by means of the console keyboard and output devices. The simplicity of the language statements enables a user to rapidly gain proficiency with the program and facilitates modification of the model via the console. In addition, the beginner is provided instructional comments via the console printer that can be suppressed as experience is gained. Simplicity and flexibility are the foremost characteristics of the program.

Features: 1130 CSMP is an adaptation of the PACTOLUS program for the IBM 1620 with additional features, increased versatility, and greater operating ease. The computing speed of the 1130 makes feasible the simulation of more complex processes and provides a greater degree of man-machine interaction. Among the features of 1130 CSMP are --

. Suppressible operating instructions for the beginner via the console printer.

. Diagnostic comments for on-line correction of errors.

. Ability to associate symbolic labels with functional blocks.

. Ability to interrupt a run, enter modifications, and proceed.

. Optional output of an updated problem deck.

Customer Responsibilities: A basic knowledge of the techniques of block modeling common to engineering and scientific practice is required. The 1130 CSMP Application Description Manual provides an introduction to these techniques. The user must perform the following functions in using 1130 CSMP.

1. Develop a block diagram using the elements of 1130 CSMP

2. Translate the diagram into corresponding 1130 CSMP statements

3. Prepare a punched card deck containing input data or alternatively enter such data from the console keyboard

4. Experiment with the simulation configuration and integration interval to assure meaningful results

5. Modify the simulation, using the on-line interaction feature of the program, to achieve the objectives of the simulation study

Sales Information: The 1130 CSMP may be classified as a "general differential equation solver". Application areas include engineering design and analysis, physical science and bio-medical research, and technical education. Interested customers may be found in the aerospace, consultant, manufacturing, federal, medical, process and education areas. 1130 CSMP has par-

ticular appeal to technical personnel lacking computer experience. The program should be considered wherever dynamic, continuous physical processes are investigated. It should be brought to the attention of potential customers considering acquisition or enlargement of small analog computer facilities.

Use: CSMP is furnished in the form of FORTRAN source decks to be compiled and stored on the 2315 Disk Cartridge used with the 1131 Model 2B CPU. The program operates entirely under control of the 1130 Monitor System. The user is required to have only a minimum knowledge of the computer system.

Programming Systems: FORTRAN is used as the source language under the 1130 Monitor Version I, Modification Level 2. Knowledge of FORTRAN is required only if the user desires to augment the complement of functional elements.

System Requirements: 1131 Model 2B (8K core and disk), 1442 Card Read Punch. The 1627 Plotter is optional but highly desirable for this application. The 1131 should be at or above Engineering Change Level 415-740D.

Program Material:

Basic -- Documentation - Application Directory, Program Reference Manual, H20-0282, containing Operating Instructions.

Machine Readable -- Source Decks and Sample Problem Deck will be distributed in card form.

Orders for basic documentation only will not be accepted at PID for this program. Form numbered manuals should be ordered through Mechanicsburg.

Reference Material: Application Description Manual, H20-0209-1 ... System Manual H20-0284 ... and IBM 1130 Disk Monitor System, Reference Manual, C26-3750. For a glossary of CSMP terms and a bibliography of continuous system simulation, please refer to the Application Description Manual.

For further information contact your Regional Manager of Scientific Marketing or your Industry Marketing Representative.

John Fahey
Director of DP Marketing

[A]　System/360 Mortgage Loan

The System/360 Mortgage Loan program, announced in P66-8 for availability 1Q 67, has been rescheduled for availability in September 1967.

Customers affected by this change should be notified immediately. For further information contact your Regional Finance Industry Marketing Representative.

[B]　System/360 On Line Teller, 32K Capability

The System/360 On Line Teller, 32K Capability, announced in P66-49 for availability November 1966, has been rescheduled for availability in February 1967. Features and specifications remain otherwise unchanged.

The following related programs will not be available on the dates previously announced. The status of these programs will be announced in January 1967.

1. S/360 On Line Teller 16K Capability, previously announced for availability 4Q 66.

2. S/360 On Line Teller Background Mortgage Processing (S/360 Mortgage Loan program announced in P66-8) Capability, previously announced for availability 1Q 67.

3. Savings Transaction Routines, availability to have been announced in December 1966.

Customers affected by these changes should be notified immediately. For further information contact your Regional Finance Industry Marketing Representative.

[C]　1130 Statistical System

The 1130 Statistical System, as described in P65-5 and announced in P66-49 for 4Q 66 availability, has been rescheduled for availability in March 1967.

Customers affected by this change should be notified immediately. The IBM 1130 Scientific Subroutines Package, currently available, will continue to serve as an interim system for some customers. For further information contact your Regional Manager of Scientific Marketing.

[D]　BPS/360 Card and Tape Utility Programs

A letter announcing retroactive support for 2400 Series Magnetic Tape Units, Models 4, 5, and 6, as input and/or output devices is now being distributed to registered users of the following programs. There is no machine readable material associated with this announcement.

These programs include the support at the version and modification levels shown:

		Version	Mod. Level
Card-to-Tape	360P-UT-051	3	1
Tape-to-Printer	360P-UT-052	3	1
Tape-to-Card	360P-UT-053	3	1
Tape-to-Tape	360P-UT-054	3	1
Initialize Tape	360P-UT-057	3	1
Tape Compare	360P-UT-202	1	1

For those programs which may generate output tapes (Card-to-Tape, Tape-to-Tape and Initialize Tape), a fourth operand may be set in the ASSGN card for 9-track assignments. This operand causes tapes to be set to either 800 or 1600 bpi. The two possible operands are X'C8' to generate 800 bpi tapes or X'C0' to generate 1600 bpi tapes. If no fourth operand is specified, X'C8' (800 bpi) is assumed.

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The following restriction is placed on all tape read operations for each program:

If a tape which is not 9-track 1600 bpi is read from a 1600 bpi only tape drive (without Dual Density feature) the error may not be diagnosed or may be diagnosed improperly.

The publication that will go to the user with this release is:

. TNL N21-5037 to IBM System/360 Basic Programming Support Operating Guide - Card and Tape Utility Programs, C24-5027-1 and C24-5027-2.

The availability of the BPS/360 Tape Compare was announced in P66-10 (ammended by P66-11), Modification Level 1 in P66-90. The availability of Version 3 of the remaining programs was announced in P66-87.

[E]　BPS/360 DASD Utility Programs

The modification levels indicated below are now being distributed to registered users:

		Version	Mod. Level
Disk to Tape	360P-UT-065	3	2
Tape to Disk	360P-UT-066	3	2

These modifications include the following improvements:

. 2400 Series Magnetic Tape Units, Models 4, 5, and 6 may now be used as input and/or output devices. The Job Control phase of each program recognizes a fourth operand in the ASSGN card for 9-track assignments. This operand causes tapes to be set to either 800 or 1600 bpi. The two possible operands are X'C8' to generate 800 bpi tapes or X'C0' to generate 1600 bpi tapes. If no fourth operand is specified, X'C8' (800 bpi) is assumed. For input tapes and with Models 4, 5, or 6 without the Dual-Density feature, a Not Capable bit is set if a tape other than 1600 bpi is read. This bit is diagnosed by the programs and the tape rewound and unloaded.

. The Supervisor phase of 360P-UT-066, Tape to Disk, has been corrected to insure detection of Track-In-Error information during tape read error recovery procedures.

The new publications that will be distributed, under separate cover, to users of these modifications are: TNLs N21-5038 and 5032 to IBM System/360 Basic Programming Support DASD Utility Programs - Operating Guide, C24-5027-1 and C24-5027-2.

The availability of Version 3 of each program was announced in P66-91 (amended by P66-100).

—————Side 1 of 2

(F) System/360 Basic Operating System

A major BOS/360 modification (System Release 10) is now available from PID. The change levels of the program components associated with the modification are:

		Change Level
Basic Control Program	360B-CL-302	1-9
ISFMS Macros	360B-IO-304	1-7
RPG	360B-RG-307	1-4
Sort/Merge	360B-SM-308	1-6
Assembler	360B-AS-309	1-7
Direct Access Macros	360B-IO-305	1-4

In addition to providing corrections for miscellaneous reported program errors, the modification includes:

800/1600 BPI Dual Density Support for 2400 Series Magnetic Tape Units

All tape files presently recorded in 800 bpi can be run without alteration on drives having the Dual Density feature. The density to be used for a particular Magnetic Tape Unit is determined by the "Device Specifications" operand of the //ASSGN card for that Magnetic Tape Unit. C8 indicates 800 bpi, and C0 indicates 1600 bpi. If the "Device Specifications" operand is omitted from the //ASSGN card, a density of 800 bpi is assumed.

Minimum System Requirements: In addition to the previously announced minimum system requirements, at least one of the following is required:

2401 or 2402 Magnetic Tape Unit, Model 4, 5, or 6, and 2803 or 2804 Tape Control, Model 2.
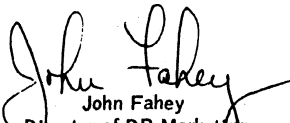
2403 Magnetic Tape Unit and Control, Model 4, 5, or 6.

2415 Magnetic Tape Unit and Control, Model 4, 5, or 6.

The new publications that go with Release 10 are -- N24-5166, N24-5117, N24-5179, TNLs to System/360 Basic Operating System Specifications, Assembler with Input/Output Macros, C24-3361-4 ... N24-5161, TNL to System/360 Basic Operating System Control Programs and Assembler Operating Guide, C24-3450-2 ... N24-5168, TNL to System/360 Basic Operating System Operating Guide Operator Messages, C24-5024-1 ... Basic Operating System/360 and System/360 Basic Programming Support - Macro Definition Language 8K Disk/Tape, C24-3364-3 ... N24-5120, N24-5164, N24-5180, TNLs to System/360 Basic Operating System Programmers Guide, C24-3372-4.

Each BOS/360 user presently on maintenance has been sent a letter highlighting the changes incorporated by the modification, along with detailed ordering procedures and a prepunched order card for the Control Program, 360B-CL-302. To receive the updated system, your customer has been instructed to secure branch office approval on the order card and forward a full width tested magnetic tape or 1316 Disk Pack to PID.

The updated tape or disk pack returned to your customer will contain all BOS/360 components. However, updated documentation will be provided only for those components for which your customer is now receiving maintenance. If your customers require components beyond those which were originally ordered, each additional component should be indicated on the back of the prepunched order card.

Your customers should be encouraged to order this major modification immediately, since subsequent change levels will be based upon it.

John Fahey
Director of DP Marketing

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System/360 Model 20 ... Tape Programming Support now available.

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IBM System/360 Model 20

All of the programs described below for the System/360 Model 20 Tape are now available.

For successful generation and execution of all programs in this letter the following minimum Engineering Change Levels are required:

	EC Level
2020 Central Processing Unit	12100
2415 Magnetic Tape Unit, Models 1, 2, 3	730666
2415 Magnetic Tape Unit, Models 4, 5, 6	730526

|A| Basic Assembler (Tape) 360U-AS-130

Purpose: This program is a modification of the Basic Assembler, card version. It provides support for Model 20 customers with minimum tape configurations.

Use: The language is identical to that of the card version, i.e., source cards are in short coding format. Punches in columns 1-24 are ignored. The operating characteristics differ, in that the program uses tape as intermediate storage between passes. The program is loaded from cards; source deck input is from cards and object deck output is on cards. This program is a stand alone system. It does not operate under the TPS Control and Service Programs below.

Performance Data: The assembly of a program consisting of 600 cards (fitting into 4K storage), with 165 symbols, requires about seven minutes.

Minimum System Requirements: A 2020 Central Processing Unit Model B2, a card reader (2501 Model A1 or A2, 2520 Model A1, or 2560 Model A1), a card punching unit (2520 Model A1-A3, 2560 Model A1, or 1442 Model 5) a 2415 Magnetic Tape Unit Model 1 or 4 with two 9-track read/write heads or -- if one or two heads are 7-track -- the Data Conversion feature, and a Printer (1403 Model 2, 7, or N1, or 2203 Model A1), which is required if it is desired to print diagnostic messages and program listings.

The following programs are collectively referred to as the Model 20 Tape Programming System (TPS).

|B| TPS Control and Service Programs

Purpose: The control and service programs generate and maintain a tape-resident system that facilitates the assembly, generation, and execution of programs. They are:

Initial Program Loader for Card-Resident System	360U-CL-136
Basic Monitor Program of Card-Resident System	360U-CL-137
Job Control Program of Card-Resident System	360U-CL-138
Initial Program Loader for Tape-Resident System	360U-CL-139
Basic Monitor Program of Tape-Resident System	360U-CL-140
Job Control Program of Tape-Resident System	360U-CL-141
Load System Tape Program	360U-SL-142
Copy System Tape Program	360U-SL-143
Directory Service Program	360U-SL-144
Core-Image Maintenance Program	360U-SL-145
Macro Maintenance Program	360U-SL-146
Linkage Editor Program	360U-SL-147

Features: Two types of control programs are available, one type is used with programs contained in cards and the other with programs on tape in core image format.

Each contains the following three programs: Initial Program Loader ... Basic Monitor Program ... Job Control Program.

The control programs provide the following advantages:

- reduced card handling
- automatic job-to-job transition
- selective retrieval of programs from the system tape
- ability to expand core storage through program overlays
- ease of operation
- tape drive assignment object time.

The service programs consist of the Load System Tape Program ... Copy System Tape Program ... Linkage Editor Program ... Library Management Programs (i.e. Core-Image Maintenance Program, Macro Maintenance Program, and Directory Service Program)

The principal functions of these programs are:

- Load System Tape Program -- builds a system tape of IBM and/or user written programs

- Copy System Tape Program -- to copy the system tape, e.g., from a 7-track to a 9-track tape

- Linkage Editor Program -- to link separately assembled program sections and/or subroutines into a single program and to relocate programs so that they can be executed without new assembly.

- Core-Image Maintenance Program -- to add or delete IBM and/or user-written programs to or from the program library of the system tape

- Macro Maintenance Program -- to add or delete IBM and/or user-written macros to or from the macro library of the system tape

- Directory Service Program -- to print the contents of the core-image directory and/or macro directory of the system tape

Performance Data: See the SRL publication IBM System/360 Model 20, Tape Programming System, Performance Estimates (C24-9010-0).

Minimum System Requirements: The minimum system requirements for the use of Model 20 TPS Control and Service Programs are as follows:

Basic Requirements:

A 2020 Central Processing Unit Model C2 ... One card reader (2501 Model A1 or A2, 2520 Model A1, or 2560 Model A1) ... One Printer (1403 Model 2, 7, or N1 or 2203 Model A1) for printing diagnostic messages, logging of Job Control Cards, displaying contents of directories, etc.

Additional Requirements:

For the control programs for a tape-resident system and for the following service programs, Load System Tape, Copy System Tape, and Directory Service: One 2415 Magnetic Tape Unit Model 1 or 4 ... One of the two tape drives must contain a 9-track read/write head. If the second head is 7-track, the Data Conversion feature is required.

For the following service programs, Core Image Maintenance, Macro Maintenance, and Linkage Editor: One 2415 Magnetic Tape Unit Model 2, 3, 5, or 6 ... with three 9-track read/write heads. If the Data Conversion feature is installed, only one 9-track head is required.

For the Linkage Editor Program: One card punch (2520 Model A1-A3, 2560 Model A1, or 1442 Model 5) if output is on cards.

Execution of user's problem programs:

1 Magnetic Tape Drive 2415 with a 9-track read/write head. This magnetic tape drive is not required, if the user's programs are executed under supervision of the control programs for a card-resident system.

[C] TPS Report Program Generator 360U-RG-148

Purpose: The TPS RPG facilitates the preparation of programs to write reports, punch cards, perform file maintenance operations, read and write tape records, and update existing tape files involving card and magnetic tape input/output.

Use: The user furnishes the generator with specification cards describing the input, necessary calculations, desired output, file description, and extension.

Features: The TPS RPG is tape-resident and has compile-and-go capability, with the option of having the machine-language program punched into cards or written on tape. If 8K bytes of core storage are available for program generation only, the TPS RPG can process a total of 17 files (input, output, combined, and table files) and tables in any combination. If the core capacity is 12K bytes, or more, the number of files and tables is not limited by program generation. In all cases, however, the maximum number of files that can be matched with each other is three. The tape records can be fixed or variable, blocked or unblocked. Tape label checking and creation conform to IBM System/360 standards. Non-standard labels are bypassed. An exit is provided to allow the processing of user labels.

Performance Data: See SRL publication IBM System/360 Model 20, Tape Programming Support, Performance Estimates (C24-9010-0).

Minimum System Requirements:

For program generation -- A 2020 Central Processing Unit Model C2 ... One 2415 Magnetic Tape Unit Model 1 or 4 with one 9-track magnetic read/write head. If the second head is 7-track, the Data Conversion feature is required...One card reader (2501 Model A1 or A2, 2520 Model A1, or 2560 Model A1) ... One Printer (2203 Model A1, or 1403 Model 2, 7, or N1), if printing of diagnostic messages is specified ... One card punch (2520 Model A1-A3, 2560 Model A1, or 1442 Model 5) if punching is specified.

For program execution -- A 2020 Central Processing Unit Model C2 and I/O devices as specified by the user.

[D] TPS Assembler Program 360U-AS-149

Purpose: The Model 20 TPS Assembler provides a powerful language for machine-oriented programming. It has facilities to write user macro definitions for repetitive routines and provisions to use the I/O and Basic Monitor macros supplied by IBM.

Use: Source programs written in either Model 20 Assembler or Model 20 Basic Assembler language and punched into cards are processed by the Assembler program to produce machine language programs. Output is punched into cards or written on tape in relocatable or absolute format.

Features: The language is a major extension of the Model 20 Basic Assembler language. It permits symbols of up to 8 characters, literals, control section definition, and various auxiliary functions. A macro language is provided to write macro definitions for generation of multiple machine or Assembler instructions. User-defined macro instructions, as well as IBM-supplied macro instructions, are retrieved from the macro library section of the system tape during the generation phase.

The Assembler Program is tape resident, i.e., it must be part of the program library section of the system tape when used.

Control cards are used to supply necessary information for Assembler options. The output text is in either absolute or relocatable format. Diagnostics are performed on all source statements. An optional listing identifies coding errors by means of error messages.

Performance Data: See SRL publication IBM System/360 Model 20, Tape Programming System, Performance Estimates (C24-9010-0).

Minimum System Requirements:

For program generation -- A 2020 Central Processing Unit Model C2 ... One IBM 2415 Magnetic Tape Unit Model 2 or 5 ... One card reader (2501 Model A1 or A2, 2520 Model A1, or 2560 Model A1) ... One Printer (1403 Model 2, 7, or N1, or 2203 Model A1)...One card punch (2520 Model A1-A3, 2560 Model A1, or 1442 Model 5) if punching is specified.

Three tape drives are used, a fourth is optional and provides the ability to process literals or to put the object program on tape.

One tape drive must have a 9-track read/write head. If the others are 7-track, the Data Conversion feature is required.

For program execution -- Requirements depend on user's program. The

Assembler language supports all available machine features and all card and tape I/O devices.

[E] TPS Input/Output and Basic Monitor Macro Definitions 360U-IO-151

Purpose: The Input/Output macros relieve the user of programming the functions required to service machine interrupts, overlap processing, and input/output operations for card, printer, and magnetic tape devices. The Basic Monitor macros allow the programmer to request services of the Basic Monitor.

Use: This program consists of a set of macro definitions to be included in the macro library of the system tape. From these definitions the Assembler generates specialized routines and/or linkages to be included in the problem programs. These routines can be used only in connection with the Basic Monitor.

Features: In addition to the features provided by the IOCS for Punched Card Equipment, the I/O macros handle:

. opening and closing of tape files

. writing, reading, and transferring of blocked or unblocked records of fixed or variable length

. blocking or deblocking of records

. checking and creation of standard tape labels (an exit is provided for checking and creation of additional user standard tape labels)

. read backwards

. tape I/O error checking and recovery procedures.

The Basic Monitor macros allow access to the communication region, loading of program phases, and job-to-job transition.

Performance Data: See SRL publication IBM System/360 Model 20, Tape Programming System, Performance Estimates (C24-9010-0).

Minimum System Requirements: The minimum requirement for assembly of programs containing I/O and Basic Monitor macro instructions is the configuration required by the TPS Assembler Program.

The minimum configuration for execution of such programs depends on processing requirements.

[F] TPS Utility Programs

Purpose: By providing generalized routines, the tape utility programs reduce the need for repetitive programming of certain operations that are performed frequently. The programs assist the user in the day-to-day operation of his installation by providing for the transfer of data from one medium to another. The tape utility programs consist of the following five separate programs:

Tape-to-Tape	360U-UT-131
Tape-to-Card	360U-UT-132
Card-to-Tape	360U-UT-133
Tape-to-Printer	360U-UT-134
Initialize Tape	360U-UT-135

Use: A Utility Modifier Card, provided for the input and output file, allows the user to specify the blocking factor, record length, control fields, etc. A Field Selection Card furnishes information to the program for transferring fields from an input record to the same or a different relative position of the output record and for simultaneously converting the data to a different format. Header cards can be used to provide titles for the pages of printed output.

Features: Except for the Initialize Tape Utility Program, the tape utilities provide for the transfer from an input medium to an output medium, with the following options: copy, reblock, field select, and reblock and field select. Printer output can be in a byte-for-byte representation of the information in core storage (display) or in an audited listing of the information in core storage (list). The Initialize Utility Program can be used to write volume labels on tape reels.

Tape input and/or output files can be

1. contained in more than one reel, or
2. selected from or placed on a reel containing more than one file.

Sequence numbering of output cards and sequence checking for input cards are available.

Tape label checking conforms to established IBM System/360 standards, and non-standard labels are bypassed. An exit is provided to allow processing of additional standard labels from the user and processing of sterling currency fields.

The tape utility programs run under supervision of the control programs for either a card-resident system or a tape-resident system.

Performance Data: See the SRL publication IBM System/360 Model 20, Tape Programming System, Performance Estimates (C24-9010-0).

Minimum System Requirements: When using the control programs for the card-resident system: A 2020 Central Processing Unit Model B2 ... One card reading device (2501 Model A1 or A2, 2520 Model A1, or 2560 Model A1) ... One 2415 Magnetic Tape Unit Model 1 or 4.

When using the control programs for the tape-resident system: A 2020 Central Processing Unit Model C2 ... One card reader (2501 Model A1 or A2, 2520 Model A1, or 2560 Model A1) ... One 2415 Magnetic Tape Unit Model 1 or 4 with at least one 9-track read/write head. The Tape-to-Tape Utility Program requires a 2415 Model 2 or 5.

For error and diagnostic messages and for the Tape-to-Printer Utility Program: One 2203 Model A1 or 1403 Model 2, 7, or N1 Printer.

For the Tape-to-Card Utility Program: One card punch (2520 Model A1-A3, 2560 Model A1, or 1442 Model 5).

[G] TPS Sort/Merge Program 360U-SM-150

Purpose: The Sort/Merge program allows the Model 20 tape user to sort tape files into ascending and/or descending sequence and to merge pre-sequenced tape files.

Use: For object program execution, the operator supplies the required control information in form of control cards.

Features: The TPS Sort/Merge program sorts binary data (including alphameric characters), fixed-point integers, packed or unpacked decimal numbers contained in blocked or unblocked records of fixed or variable length in an ascending and/or descending order. It also merges pre-sequenced files (2-5 files). Operations are performed according to control data contained in up to 12 fields of each record, with a maximum length of 256 bytes for all control fields. When merging, the sequence of all files is checked. The program provides for exits to user-written routines as well as for checkpoints and restart. Tape input and/or output files can be:

1. contained in more than one reel, or
2. selected from or written on a reel containing more than one file.

Tape label checking conforms to established IBM System/360 standards and non-standard labels are bypassed. An exit is provided to allow processing of additional standard labels from the user. The program runs under supervision of the control programs for either the card or the tape-resident system.

Performance Data: See SRL publication IBM System/360 Model 20, Tape Programming System, Performance Estimates (C24-9010-0).

Minimum System Requirements: A 2020 Central Processing Unit Model C2 ... One 2501 Model A1 or A2 Card Reader, 2520 Model A1 Card Read Punch, or 2560 Model A1 MFCM ... One 1403 Model 2, 7, or N1 or 2203 Model A1 Printer for printing of error and diagnostic messages ... One 2415 Model 2 or 5 Magnetic Tape Unit. At least three tape drives are required for the program itself. A fourth tape drive is required, if the program is run from the system tape.

Restrictions on tape drive configurations:

With 9-track input tapes and/or 7-track input tapes, that were created with the Data Conversion feature turned on, output tapes must be 9-track tapes and/or 7-track tapes with the Data Conversion feature turned on. For sorting, 9-track work tapes must be used.

With 7-track input tapes, that were created with the Data Conversion feature turned off, output tapes can be either 9-track or 7-track tapes. For sorting, work tapes may be either 9-track or 7-track.

All 7-track tapes used in a given sort or merge operation must have the same characteristics. For example, if the translate capability of the compatibility special feature is used when 7-track

input tapes are created, it must be used with all 7-track work or output tapes.

Files of variable-length records to be sorted or merged must be created on 9-track tapes or on 7-track tapes with the Data Conversion special feature turned on. Therefore, per the above, 9-track work tapes must be used when sorting variable-length records.

Checkpoint records will be written only on 9-track work tapes or 7-track work tapes with the Data Conversion feature.

Distribution Packaging

Basic Program Material

Documentation: A Program Material List and an attachment to users will be provided in answer to each request. In addition, the appropriate SRL publications are provided as listed below:

* *

Basic Assembler (Tape), 360U-AS-130

IBM System/360 Model 20
  Basic Assembler Language   C26-3602-2 &
              TNL N24-9009
  Basic Assembler (Tape), Operating
  Procedures   C24-9011-0

* *

TPS Control and Service
 IPL for Card-Resident System, 360U-CL-136
 Basic Monitor Program of Card-Resident System, 360U-CL-137
 Job Control Program of Card-Resident System, 360U-CL-138
 IPL for Tape-Resident System, 360U-CL-139
 Basic Monitor Program of Tape-Resident System, 360U-CL-140
 Job Control Program of Tape-Resident System, 360U-CL-141
 Load System Tape Program, 360U-SL-142
 Copy System Tape Program, 360U-SL-143
 Directory Service Program, 360U-SL-144
 Core-Image Maintenance Program, 360U-SL-145
 Macro Maintenance Program, 360U-SL-146
 Linkage Editor Program, 360U-SL-147

IBM System/360 Model 20, Tape Programming System
  Control and Service Programs   C24-9000-1
  Operating Procedures   C24-9009-0
  Performance Estimates   C24-9010-0

* *

TPS Report Program Generator, 360U-RG-148

IBM System/360 Model 20, Disk and Tape Programming Systems
  Report Program Generator   C24-9001-2
IBM System/360 Model 20, Tape Programming System
  Operating Procedures   C24-9009-0
  Performance Estimates   C24-9010-0

* *

TPS Assembler Program, 360U-AS-149

IBM System/360 Model 20, Disk and Tape Programming Systems
  Assembler Language   C24-9002-2
IBM System/360 Model 20, Tape Programming System
  Operating Procedures   C24-9009-0
  Performance Estimates   C24-9010-0

* *

TPS Input/Output and Basic Monitor Macro Definitions, 360U-IO-151

IBM System/360 Model 20, Tape Programming System,
  Input/Output Control System   C24-9003-1
  Control and Service Programs   C24-9000-1
  Operating Procedures   C24-9009-0
  Performance Estimates   C24-9010-0

* *

TPS Utilities
 Tape-to-Tape, 360U-UT-131
 Tape-to-Card, 360U-UT-132
 Card-to-Tape, 360U-UT-133
 Tape-to-Printer, 360U-UT-134
 Initialize Tape, 360U-UT-135

IBM System/360 Model 20, Tape Programming System
  Utility Programs   C26-3808-1
  Card-Resident Utility Programs, Opera-
  ting Procedures   C26-3809-0
  Operating Procedures   C24-9009-0
  Performance Estimates   C24-9010-0

TPS Sort/Merge Program, 360U-SM-150

IBM System/360 Model 20, Tape Programming System

Sort/Merge Program	C26-3804-1
Operating Procedures	C24-9009-0
Performance Estimates	C24-9010-0

* *

If any SRL item is common to more than one of the above programs, only one copy of that SRL will be sent as part of the package.

Orders for basic documentation only will not be accepted at PID for these programs. Form numbered manuals should be ordered through the IBM Distribution Center, Mechanicsburg.

Machine Readable Material: Depending upon the machine configuration, the user of a Model 20 Tape System will be able to use one of the following sets of programs:

(1) Users having a Model 20 Tape System with at least 4K core storage and two tape drives may select any of the programs below. This configuration allows the System to use the Basic Assembler (Tape), stand alone ... and the TPS Utility Programs, under the supervision of the control programs for a card-resident system.

IPL for Card-Resident System	360U-CL-136
Basic Monitor Prgm of Cd-Resident Sys.	360U-CL-137
Job Cont'l Prgm of Cd-Resident System	360U-CL-138
Card-to-Tape	360U-UT-133
Initialize Tape	360U-UT-135
Tape-to-Card	360U-UT-132
Tape-to-Printer	360U-UT-134
Tape-to-Tape	360U-UT-131
Basic Assembler (Tape)	360U-AS-130

For distribution purposes, all of these programs will be packaged on a 9-track DTR (800 or 1600 bpi) or 7-track DTR (800 bpi). The 7-track DTR requires the Data Conversion feature. Each DTR contains a retrieval program which punches the program material into cards.

(2) Users having a Model 20 Tape System with at least 8K core storage and two tape drives may select (in addition to the programs in paragraph 1) any of the programs below.

This configuration allows the user to build a system tape from card input. Changes to this system tape must be made by the creation of a new system tape from the updated card files of all programs included in the system tape.

The TPS Report Program Generator runs from the system tape only. The TPS Utility Programs run under supervision of the control programs for either the card or the tape-resident system. Since the TPS Tape-to-Tape Utility Program that runs under a system tape requires three tape drives, the user of a system with a two Tape Drive must use this program only under supervision of the control programs for a card-resident system.

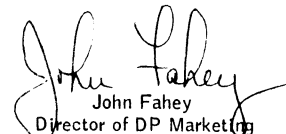|	
IPL for Tape-Resident System	360U-CL-139
Copy System Tape Program	360U-SL-143
Load System Tape Program	360U-SL-142
Basic Monitor Prgm of Tape-Resident Sys.	360U-CL-140
Job Cont'l Prgm of Tape-Resident Sys.	360U-CL-141
Directory Service Program	360U-SL-144
TPS Report Program Generator	360U-RG-148

For distribution purposes, all of these programs and those from paragraph 1 will be packaged on one 9-track (800 or 1600 bpi) DTR. The DTR contains a retrieval program which punches the program material into cards.

(3) Users having a Model 20 Tape System with at least 8K core storage and four or more tape drives may select (in addition to the programs in paragraphs 1 and 2) any of the programs below.

This configuration allows the user to update the system tape by the replacement of phases or macros from card or tape input. To allow modifications of individual phases or macros by replacement of cards, however, the program material must still be kept current as a card file.

The TPS Assembler Program and the TPS Input/Output and Basic Monitor Macro Definitions must be stored on the system tape. The TPS Sort/Merge Program will run under supervision of the control programs for either the card- or the tape-resident system.

TPS Assembler Program	360U-AS-149
Core-Image Maintenance Prgm	360U-SL-145
Linkage Editor Program	360U-SL-147
Macro Maintenance Program	360U-SL-146
TPS Sort/Merge Program	360U-SM-150
TPS Input/Output and Basic Monitor Macro Definitions	360U-IO-151

For distribution purposes, all of these programs and those from paragraphs 1 and 2 will be packaged on one 9-track (800 or 1600 bpi) DTR. The DTR contains a retrieval program which [1] Punches the program material into cards ... [2] Prepares an input tape for a system generation run.

Ordering Instructions

To order Model 20 Tape Support Programs use the Program Order Card (120-1102-1). Insert "360U" in the program number block on the front of the card. On the reverse side include the program number of each component for which the customer requires program documentation and maintenance. For those programs selected only from paragraph 1, indicate whether 7-track (800 bpi) or 9-track (800 or 1600 bpi) DTRs are required. If not specified, 9-track DTRs copied at 800 bpi will be supplied. DTRs are supplied by PID - no tape submittal is required.

Maintenance

IBM will update the programs specifically identified on the program order card (120-1102-1), by distribution of corrected phases or macros either in card or DTR form. When DTR is used, the modifications would be packaged according to the principle described for complete program distribution.

John Fahey
Director of DP Marketing

IBM OPERATING SYSTEM/360

The MVT Control Program (Multiprogramming with a Variable Number of Tasks (Option 4) and Priority Scheduling), with QTAM and BTAM will be available 2Q 67.

MVT offers for the first time in Operating System/360:

. Priority Scheduling of jobs submitted from single or multiple job streams.

. Concurrent scheduling and execution of up to 15 separately protected jobs.

. System controlled concurrent transcription of system input and output data.

. System Restart that assists operational recovery after system failure or normal power down.

. JOB STEP timing.

. The "ATTACH" facility for asynchronous sub-tasking within a Job Step.

Multiprogramming with a Variable Number of Tasks (MVT)

MVT Supervisor (Option 4)*

The following functions are added to those available with the Primary Supervisor of the OS/360 Primary Control Program (PCP):

. Concurrent control of a variable number of tasks.

. Dynamic attaching and synchronization of sub-tasks.

. Task dispatching on the basis of priorities which may be changed by the task itself during execution.

. Scatter loading of relocatable programs within an assigned main storage region.

. Asynchronous overlay supervision.

. Multiple transient areas that can increase the performance of the system when non-resident SVC routines are required.

. Shared Modules - a directory of modules currently residing in main storage together with information describing their use and attributes so that, if their attributes permit, the modules may be shared within a job step. Across Job Step sharing is controlled by a separate directory of modules selected by the user for inclusion in the resident portion of the control program.

. Job Step main storage protection.

. Provision for conditional requests for resources as well as control of data set sharing among jobs. (ENQ/DEQ).

. Telecommunications Access Methods (BTAM and QTAM).

. System Restart - When a new IPL is required because of system failure or continuation after normal power down, facilities are provided to recover jobs that were in the input queue that have not been initiated and output data sets that have not yet completed transcription by an Output Writer. For jobs that were in process, output for the steps in process as well as output for completed Job Steps is retained in the output queue for later transcription upon restart. Each job that was being processed by an Output Writer is re-enqueued at the beginning of the data set being processed. In addition, the name of each job that was being processed by each Reader/Interpreter and each job in process of execution are listed for the operator.

*Options are described in the SRL, Operating System/360 Storage Estimates, C28-6551.

Protection against loss of job steps that were in job step execution will be provided through the problem programmer's use of Job Step Checkpoint/Restart facilities, when such facilities are added to the system.

The following features are planned for subsequent announcements:

. Checkpoint/Restart.

. Rollout/Rollin - Allows one job to obtain additional main storage by displacing the contents of one or more regions occupied by lower priority jobs. The rolled out region(s) are returned to their original locations in main storage when the job step requiring the extra main storage releases them.

. Disk SYSIN allows disk to be used as a source for a Reader/Interpreter.

. Disk SYSOUT allows disk to be the output device for a SYSOUT Writer. (Disk is used as the input device for all SYSOUT writers).

MVT Priority Scheduler

The MVT Scheduler provides a work queue, and jobs in the work queue are initiated in priority sequence. The Priority Scheduler permits multiple job initiation, one or more readers and one or more writers. The following functions are included:

. Asynchronous reading and writing of job input/output data. Blocked input and output are permitted.

. Reading and interpreting control statements using features of the job control language.

. System log.

. Allocation of input/output devices.

. Job step timing.

. Alternate and composite console.

. Channel separation and affinity requests which allow for channel usage to be optimized by balancing the channel requirements of one data set with those of other data sets in the same job step.

Note:

1. Automatic Volume Recognition is not provided for MVT. In a priority scheduling system, the operator cannot predict the order in which jobs will be run and therefore does not know which job to set up next.

2. ALGOL, Assembler E and COBOL E will not be tested with MVT prior to its first release. There is no known upward incompatibility concerning these products. They will be supported at a later time after adequate testing has been accomplished.

3. The special single job initiator is not included in MVT, since single-job initiation is provided as a subset of the more flexible operator-controlled MVT initiators. As a result, projected mount and non-setup job execution, which were only planned for the

special single job initiator, are not a part of MVT support. Work is in process to improve the operational characteristics of the Operating System. An announcement of new facilities in the area of Operator/System interaction will be provided as soon as a firm implementation plan exists.

4. The STAE Macro, as defined in the Control Program Services SRL, C28-6541, is withdrawn for MVT. Similar function is provided by the ETXR parameter of the ATTACH Macro.

5. The use of remote terminals for input job streams or output from writers, as described on Sales Manual Pages P360.1 and Note 1 on P10 is withdrawn.

Control Programs	Avail Date
Multiprogramming with a variable number of tasks with Priority Scheduler (MVT)	2Q67
Checkpoint/Restart	****
Rollout/Rollin	****
Disk SYSIN/SYSOUT	****

Access Methods	
Telecommunications - Basic	2Q67
Telecommunications - Queued	2Q67

****Schedule to be announced.

MVT Preliminary Main Storage Requirements

A partial set of main storage requirements is provided for OS/360 MVT. Main storage requirements for two example configurations are explained for your guidance. Some component sizes used in the examples are also provided so that the examples may be modified to more closely fit the needs of individual users.

Complete storage estimates will be distributed in SRL form subsequently. Those storage estimates relating to MVT options contained in the SRL, Operating System/360 Storage Estimates, C28-6551 are obsolete and no longer valid.

Example 1

System/360 Models with 256K bytes of main storage.

I/O Devices assumed in the Nucleus estimate: eight 2400 Tape Units ... six 2311 Disk Storage Drives ... one 2540 Card Read Punch ... one 1403 Printer.

OS/360 MVT Components: (minimum requirements)

. Supervisor nucleus with two transient areas.
. System Queue Space for control block information.
. Master Scheduler.
. A Minimum Link Pack area that includes the BSAM-QSAM space requirement for the Reader/Interpreter and Output Writer.
. One Output Writer.
. Systems ENVIRONMENT Recorder (SER 0).

The total resident main storage requirement for the above components is approximately 90K bytes. In this example the Reader/Interpreter when operating requires additional space. See Reader/Interpreter description.

The Supervisor nucleus in both this example and the one which follows, contains, in addition to the Primary Control Program (PCP) facilities:*

Multiple WAIT	Option 1
Resident IDENTIFY	Option 3B
Interval Timing	Option 6B
Job Step Main Storage Protection	Option 9
Job Step Timing	Option 13
Validity Check	Option 15
Resident Attach	Option 16
Resident Extract	Option 17
Resident SPIE	Option 18
Capability for using BDAM	Option 20
Transient SVC Table	Option 22
PCI Fetch	Option 26

*Options are described in the SRL, Operating System/360 Storage Estimates, C28-6551.

Example 2

System/360 models with 512K or more bytes of main storage. (A typical system).

I/O Devices assumed in the Nucleus estimate: twelve 2400 Tape Drives ... eight 2311 Disk Storage Drives ... one 2301 Drum Storage ... one 2540 Card Read Punch ... three 1403 Printers.

OS/360 MVT Components:

. Supervisor nucleus with eight transient areas (Opt 5), Systems Environment Recorder (SER1), and resident BLDL.
. System Queue Space for control block information.
. Master Scheduler.
. A Link Pack area that includes space for the complete BSAM-QSAM routines.
. One Reader/Interpreter.
. Three Output Writers.

The total resident main storage requirement for the above components is approximately 198K bytes.

The Supervisor nucleus of Example 2 includes in addition to the above:

. Additional IOS for I/O devices.
. Six Additional Transient Areas - Option 5.
. SER1 - Option 23B.
. Resident BLDL Table - Option 24.
(2000 bytes were included for a portion of the Link Library Directory).

(Options 7, 8, 19, and 21 are not included in either example).

The Link Pack area may be expanded to contain additional user-selected resident re-enterable modules for sharing among regions.

Input Reader/Interpreters:

Reader/Interpreters may operate either partially resident or non-resident. Non-resident Reader/Interpreters (Example 1) require a 40K byte Region when running. This space is available for problem program usage when the reader is stopped.

Example 2 includes 40K bytes in the total resident main storage requirements, since it is assumed that this size system would have sufficient input data to require a Reader/Interpreter full time.

Part of the Reader/Interpreter may be made resident in the Link Pack area to reduce main storage requirements when more than one full time Reader/Interpreter is required. In this case the following main storage requirements apply:

Link Pack area requirement for reader	30K bytes
Approximate Region space for each Reader/Interpreter	12K bytes
(i.e. 2 Reader/Interpreters - 54K bytes; 3 Reader/Interpreters - 66K bytes, etc.)	

Output Writers:

Approximate Region space for each Output Writer (allowing up to 4K bytes to impact buffers)	14K bytes

Initiator/Terminator:

The Initiator/Terminator requires a Region size of 44 to 60K bytes, depending on input buffering selected for performance, to initiate job steps and the same space is required at termination time. This space is available to the job step after initiation.

John Fahey
Director of DP Marketing

[A] System/360 BPS FORTRAN IV (Tape)

Version 3 of BPS/360 FORTRAN (Tape) System, 360P-FO-031, is available from PID. It includes (1) corrections for APARs, (2) addition of I/O support, with full error recovery facilities, for the 2520 Card Read Punch, which may be used for Read only, Punch only or combined Read Punch operations, the 2520 Card Punch, and the 2501 Card Reader, (3) improved object time output conversion routines in order to increase object time printer speed,* and (4) addition of I/O support for 2400 Series Magnetic Tape Units, Models 4, 5, and 6. An addition has been made to the device assignment option of the SET control card: For Models 4, 5, and 6 with the Dual Density feature, b=adr(2400L) indicates 800 bpi, and b=adr(2400) indicates 1600 bpi. For Models 4, 5, and 6 without the Dual Density feature, b=adr(2400) must be specified.

*This increase in object time printer speed is in addition to the increase previously provided by Modification Level 2 of Version 2 (see P66-42).

BPS/360 FORTRAN (Tape) System comprises a compiler (including library subroutines), a loader, and an editor.

BPS FORTRAN Tape Compiler - The Compiler is an eight-phase program which translates programs written in the FORTRAN IV language into relocatable object programs. A source program listing along with error indicators and a storage map of the variables, external references, and constants are provided on request.

A compile-and-go feature is provided. The job to be performed may consist of source program(s), previously compiled object program(s), or a combination of the two. Also provided are control card capabilities which enable the user to change device assignments at edit, compiler, or object time.

Loader - The FORTRAN Loader is a two-phase relocating loader that can load separately compiled programs into storage and complete the linkages between them. This loader will also load input acceptable to the BPS/360 Basic Utilities Relocating Loader (360P-UT-020).

Editor - The FORTRAN Editor enables library subroutines to be deleted, added, or changed, as well as proprietary changes to the Compiler and Editor itself.

Minimum System Requirements: A System/360 with a Scientific Instruction Set and 16K or more bytes of main storage and the following minimum I/O units: one or any combination of the following devices that provides for card reading and punching -1442 Card Read Punch, 2501 Card Reader, 2520 Card Read Punch, 2520 Card Punch, 2540 Card Read Punch ... 1403 or 1443 Printer ... three 2400 Series Magnetic Tape Units, either 9-track or 7-track with the Data Conversion and 7-track Compatibility features ... an optional 2400 Series Magnetic Tape Unit for compile-and-go ... an optional 1052 Printer Keyboard.

Machine Configuration

	SYSIN	Punch	Print	Compiler Work Files	Go File	Object Program Workfiles
2501	X					X
2520	X	X				X
2540	X	X				X
1442	X	X				X
1403			X			X
1443			X			X
1052			X			X
2400	X	X	X	X	X	X

Reference Publications: System/360 Principles of Operation, A22-6821 ... FORTRAN General Information,

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CONTENTS

F28-8074 ... FORTRAN for System/360, R29-0081 through R29-0087 ... System/360 Basic FORTRAN IV Language, C28-6629.

Basic Program Material:

Documentation -- Program Material List ... Reblock Operating Instructions ... Attachment.

SRL Publications -- System/360 Basic Programming Support FORTRAN IV (Tape) Programmer's Guide, C28-6583-1 with TNLs N21-5027 and N21-5033 ... or C28-6583 with TNLs N28-2108, N28-2118, N21-5006, N21-5027, and N21-5033 ... System/360 Basic FORTRAN IV Language, C28-6629.

Orders for the basic documentation only will not be accepted at PID for this program. Form numbered manuals should be ordered through Mechanicsburg.

Machine Readable -- one 9-track or 7-track (Data Conversion feature required) system tape containing the compiler, loader, library, and editor.

When ordering, indicate if a 9- or 7-track tape is required. If not specified, a 9-track tape will be forwarded.

Note: Current users will not receive the new version automatically. Instead, they will receive a prepunched order card and a letter announcing the new version and instructing them to order it through the branch office.

[B] IBM System/360 Numerical Control Processors

The availability of the N/C 360 AD-APT and N/C 360 AUTOSPOT Processors, previously announced in P66-51 as available in March 1967, has been rescheduled and will now be available in July 1967.

The N/C 360 APT Processor will be available in March 1967 as scheduled. However, the APT Processor will not contain Cutter Path Generation, and no future development effort is planned for this feature.

Customers affected by these changes must be notified immediately.

For further information contact your Regional Industry Representative for Manufacturing.

[C] IBM 1130 Numerical Surface Techniques and
        Contour Map Plotting

This program, announced in P66-47 for February 1967
availability, will not be available on that schedule.
Its availability will be announced in a subsequent
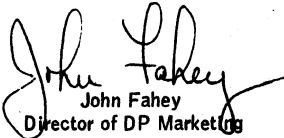letter to be released in February 1967.

Customers affected by this change must be notified
immediately.

For further information contact your Petroleum
Industry Representative.

[D] IBM System/360 Emulators

Correction to P66-115, Item [C].

Tape Overlap Emulator for Model 30 with 1401/1440/1460
Compatibility Feature program number should be 360C-
EU-097 instead of 360C-EU-074.

John Fahey
Director of DP Marketing

+---+
| Note to World Trade Readers |
| |
| This letter is a reprint of an IBM Programming Announcement and was mailed |
| concurrently to USA and WT offices. The following changes, when appropriate, |
| should be applied to the text for WT use. |
| [1] All programs announced as available have been shipped to the appropriate |
| WT Program Libraries. Programs and associated material may be ordered |
| as indicated on pages 13 through 17, Programming Section, WT DP Sales |
| Manual. |
| [2] Advance copies of the form numbered publications mentioned in the above |
| either have been shipped (with additional copies available from the IBM |
| Distribution Center, Mechanicsburg, Pennsylvania) or will be shipped when |
| available. In the case of the latter, availability will be announced in the |
| Weekly DP Marketing Publications Release Letter. |
| [3] When a new version of a program is announced current users must order it; |
| they will not receive it automatically nor will they necessarily receive a |
| prepunched request card in their Area. |
| [4] If DTR distribution is indicated in the above, program distribution media may |
| be different in your area based on local conditions. |
| [5] All references made to the Program Information Department [PID] should be |
| understood to mean the appropriate WT Program Library. |
| [6] Any reference made to DPD Departments as sources of information or for |
| manuals etc. should be understood to mean the comparable WT Department. |
| [7] Communications facilities or services may be required which are not offered |
| in all WT countries. In case of any doubt as to the availability of suitable |
| communications facilities, the country Teleprocessing Coordinator should |
| be consulted. |
| [8] All references made to Engineering Changes required for programs should |
| be verified with the local CE Branch Office. Although E/C requirements |
| are identical for WT and IBM, E/C availability dates and shipping |
| schedules may differ. |
+---+

[A] System/360 Basic Programming Support (BPS/360)

A letter announcing support for 2400 Series Magnetic Tape Units, Models 4, 5, and 6, as input and/or output devices is now being distributed to registered users of the following programs. There is no machine readable material associated with this announcement.

These programs include the support at the version and modification levels shown:

		Version and Modification Level
Basic Assembler	360P-AS-021	2 - 2
Absolute Loader	360P-UT-017	2 - 3
Dump Program	360P-UT-019	2 - 3
Relocating Loader	360P-UT-020	2 - 3

TNL N24-5183 to System/360 Basic Programming Support Basic Utilities, C28-6505-3, and System/360 Basic Programming Support Operating Guide for Basic Assembler and Utilities, C28-6557-3, are being sent to all registered users.

[B] System/360 Basic Programming Support (BPS/360)

The BPS/360 modification levels below are now being distributed to registered users:

		Version and Modification Level
Input/Output 1412/1419	360P-IO-058	3 - 1
Input/Output 1418/1428	360P-IO-059	2 - 1
Input/Output 1231 N1	360P-IO-060	2 - 1
Rpt Prgm Generator (Tape)	360P-RG-201	1 - 2
Copy Disk to Tape and Restore Tape to Disk	360P-UT-061	1 - 1
Copy Data Cell to Tape and Restore Tape to Data Cell	360P-UT-071	1 - 1

Each modification incorporates support for 2400 Series Magnetic Tape Units, Models 4, 5, and 6, with or without the Dual Density feature. All tape files presently recorded in 800 bpi can be run without alteration on drives having the Dual Density feature. For details refer to the current SRL publications.

SRL Publications -- The following SRLs have been distributed to current users.

360P-RG-201

TNL N24-5176 to System/360 Basic Programming Support Specifications - Report Program Generator, C24-3418-1.

360P-IO-058

TNLs N24-5079 and N24-5158 to System/360 Basic Programming Support Input/Output 1412/1419, C24-3398-2 ... TNL N24-5080 to System/360 Basic Programming Support Operating Guide Input/Output 1412/1419, C24-3419-1.

360P-UT-061 or 360P-UT-071

System/360 Basic Programming Support DASD Utility Programs - Specifications, C24-3363-4 ... System/360 Basic Programming Support DASD Utility Program, Operating Guide, C24-3392-5, and TNLs N21-5032, N21-5038.

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Published by DP Sales Publishing Services, WTHQ

[C] System/360 Basic Programming Support (BPS/360)

Version 3 of BPS/360 I/O Support Package, 360P-UT-018, is available. It provides the following support: [1] I/O Device Support for the 2501 Card Reader and 2520 Models B1 (Card Read Punch), B2, and B3 (Card Punches). This support enables the 2501 and/or the 2520 Model B1 to satisfy minimum system requirements for a card reader, and the 2520 (all models) to satisfy such requirements for a card punch. [2] I/O Support for 2400 Series Magnetic Tape, Models 4, 5, and 6, with or without the Dual Density feature.

All tape files presently recorded in 800 bpi can be run without alteration on drives having the Dual Density feature.

No other changes have been made, therefore, the program description and minimum system requirements as stated in P65-31 are still current.

Basic Program Material

Documentation -- Program Material List plus an Attachment #1 (Special Information).
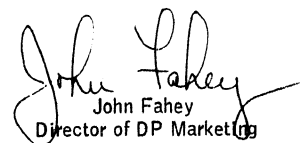
SRL Publications -- System/360 Basic Programming Support Basic Utilities, C28-6505-3, and TNLs N24-5135 and N24-5183 ... System/360 Basic Programming Support Operating Guide for Basic Assembler and Utilities, C28-6557-3.

If only the form numbered manuals are required, order them through the IBM Distribution Center, Mechanicsburg -- not from PID.

Machine Readable -- Sample Problem Symbolic Deck and Input/Output Support Package Symbolic Deck, may be obtained on one 9-track or 7-track DTR (Data Conversion feature required), or in card form. When ordering on DTR, indicate if 9-track or 7-track is required. If not specified, a 9-track DTR will be forwarded.

Current users will not receive the new version automatically. Instead, they will receive a prepunched order card and a letter announcing the new version and instructing them to order it through the branch office.

DTRs will be supplied by PID -- no tape submittal is required.

John Fahey
Director of DP Marketing

Operating System/360

OS/360 will provide the FORTRAN user with two additional compilers on January 18, 1967 ... [1] A FORTRAN IV G which will be usable with 128K or more of main storage, and ... [2] FORTRAN IV H which was previously available on a limited basis.

The G compiler offers users with 128K or more of main storage fast compile time with partially optimized execution time.

FORTRAN IV H compiler has the capability of producing highly efficient object code exceeding that obtained by the more traditional register and branching optimization techniques.

OS/360 FORTRAN IV G *

The OS/360 FORTRAN IV H compiler currently in the sales manual is at the G design level and will be called OS/360 FORTRAN IV G. Programming pages P9, P 360.4, and P 360.5 of the sales manual (December 1966 Revision) will be updated to reflect this change.

The minimum main storage requirement is approximately 80K bytes for 400 source statements.

FORTRAN IV G provides extensions to the language beyond USASI FORTRAN including --

Support of direct access storage (BSAM and BDAM).

Ability to replace the H FORMAT specification by enclosing apostrophes.

The T-specification, permitting printed output to begin at any print position.

IMPLICIT statement allowing extended implicit classification by first character of a name.

An extended type statement, including length specification.

G-conversion, extended to cover all numeric and logical data types.

Multiple entry points to sub-programs, and non-standard returns from subroutines.

Arrays of up to seven dimensions.

PAUSE statement extended to permit output of messages.

NAMELIST statement permitting input/output and conversion without an explicit I/O list and FORMAT statement.

Extended subscripts.

Hexadecimal constants and FORMAT code.

Debugging Features.

OS/360 FORTRAN IV H *

This compiler has been available as FORTRAN IV H (2.6), 360Y-FO-001, on a limited basis since June 1966. It will be available as a Type I release 1/18/67 under a new number. *

The H compiler offers the user the ability to improve object code efficiency by employing one of three options. OPT = 0 produces the fastest compile time with minimal optimization in object code. OPT = 1 increases compile time slightly, but optimizes branching and register usage in the object code produced. OPT = 2 further increases compile time, but produces a high efficiency object code. The H compiler requires approximately 200K bytes of main storage for 350-500 source statements.

FORTRAN IV H differs from FORTRAN IV G in that it does not handle direct access devices and it does not have the debug facility.

OS/360 FORTRAN IV Library, 360S-LM-501

The FORTRAN library contains relocatable subprograms which can be called by FORTRAN object programs. This library includes subprograms for logarithmic, exponential, trigonometric and other mathematical functions. This library serves FORTRAN IV E, G, and H.

The IBM FORTRAN IV language is compatible with and encompasses the United States of America Standards Institute (USASI), formerly the American Standards Association (ASA), FORTRAN including its mathematical subroutine provisions.

*Program number to be announced.

When initially available, both compilers will deviate from the USASI standard concerning the ordering of variables in COMMON blocks and EQUIVALENCE groups. A description of this restriction appears on the inside cover of the FORTRAN IV language SRL, C28-6515-4. In addition, a restriction exists in the use of FORTRAN IV H which requires dimension information to occur before certain uses of the EQUIVALENCE statement. These restrictions will be removed in subsequent releases of each compiler.

The FORTRAN IV language specifications processed by the G and H compilers are described in FORTRAN IV Language, C28-6515-4, and TNL N28-2147.

Changes in Availability Dates

The following OS/360 items have changes in the date of availability:

	Original Availability Date	New Availability Date
Data Set Control		
Optional Protection of Specified Data Set (Password)	12/30/66	3/15/67
Access Methods		
Sequential and Partitioned		
Track Overflow (Record Overflow feature)		
(BSAM, QSAM, BPAM)	12/30/66	3/15/67
Chained Scheduling		
(BSAM, QSAM, BPAM)	12/30/66	3/15/67
Exchange Buffering (QSAM)	12/30/66	3/15/67
Update Mode (BSAM, QSAM)	12/30/66	3/15/67
Direct		
Read Exclusive	12/30/66	3/15/67
Track Overflow (Record Overflow Feature)	12/30/66	3/15/67
Language Translators		
FORTRAN IV G	12/30/66	1/18/67
FORTRAN IV H		1/18/67
PL/I F Improved Version	7/31/67	1/18/67
COBOL E		
USE verb after standard I/O error	–	3/15/67
Service Programs		
Utilities		
Tape Volume Label Creation	12/30/66	3/15/67
ISAM Load/Unload Utility	12/30/66	3/15/67
Move/Copy – Record Overflow	12/30/66	3/15/67
Print/Punch Improvement	12/30/66	3/15/67
2400 – Dual Density Feature	12/30/66	3/15/67

Users of OS/360 should be informed of these new availability dates, and of the improvements to OS/360 released ahead of schedule in Releases 6, 7 and 8 (P66-93, P66-101 and P66-114).

John Fahey
Director of DP Marketing

[A] IBM DOS/360 Autotest

Autotest under DOS/360 had been scheduled for delivery 1/13/67. It has now been rescheduled to 2/17/67.

Customers affected by this change should be notified immediately.

[B] IBM System/360 FLOWCHART

This application program (360A-SE-22X) may now be ordered. Shipments will begin the week of January 9, 1967.

System/360 FLOWCHART is a program for generating printed program flowcharts from statements written in a specially designed input language. Only a general understanding of flowcharting is needed by the user of this program. It can be used readily by non-programmers as well as programmers. The input language is easy to learn, simple to use, and will describe flowcharts for any system.

Advantages: System/360 FLOWCHART will help you and your customers by:

. Providing an easy-to-use method of producing flowcharts.

. Reducing total program effort by minimizing the time required for producing and maintaining necessary program documentation.

. Facilitating program maintenance in a dynamic environment by providing a cross-reference listing which gives all references to a block shape.

. Providing wide flexibility for drawing flowcharts to specific user requirements.

. Providing flowchart uniformity.

Although the input language has been simplified considerably and is entirely different, the output format is similar to the 7070/74 Autochart program.

Description: The program uses data processing methods to facilitate the production of program flowcharts and certain other graphic information. The user prepares the original input in System/360 FLOWCHART language. This language is very simple and is machine independent. It can be used to prepare flowcharts for any system. The computer processes this input to produce a file of charts on the 1403 Printer.

If a flowchart is to be produced, it will: describe the type of blocks, symbolically direct non-sequential flow, and supply any other information desired, such as labels, exit conditions, text within blocks, etc. The language can also be used to describe lines other than flowlines and any other textual information.

The flowchart pages, each of which can have up to 50 blocks, are planned automatically by System/360 FLOWCHART. Flowlines are drawn where possible, and where they cannot be drawn, connectors are generated.

All block shapes used in System/360 FLOWCHART are combinations of printer characters to approximate conventional flowchart symbols. An option is provided so that either the Autochart Symbols or the Flowchart Symbols for Information Processing (X3.5-1966) as approved by the United States of America Standards Institute on June 8, 1966 may be specified.

There are six basic operator types for input; one is required for every statement. They are:

1. Headings, used to generate new headings and page numbers.

2. Block-shape operators to designate the type of block desired.

3. Branching or flowline control, to designate conditions and symbolic line destinations when the flow is non-sequential.

4. Spacing, used to skip blocks or columns or eject a page.

5. Comment and Draw operators to add comments and lines.

6. End of Job operator, which is required.

Use: System/360 FLOWCHART is a multi-phase program; the output of each phase becomes input to a later phase. The input can be cards or tape in card-image format. The final output will be printed charts or charts on tape. In addition to the machine-generated flowcharts, the output will include:

1. A diagnostic listing of the analyzed source decks.

2. A Label Table listing.

3. A Cross-Reference listing.

4. Various error reports

   a. Blank labels
   b. Undefined labels
   c. DRAW errors
   d. COMMENT errors

Features:

. Ease in preparation of input data which may be in free or fixed format

. Automatic page planning facilities

. Direction of branch flowlines by symbolic reference

. Striping any block to indicate subroutines

. Automatic footnoting of overflow block text

. Up to three lines (of 120 characters each) of header information

. Automatic or user designated pagination of printed charts

. Automatic dating of charts

. Sequenced label table listing

. Cross-reference listing

. Diagnostic listing of input with error flags

. High quality output with powerful line searching abilities

. On and off-page connectors generated automatically

. Automatic branch table generation

. Reduced key punching requirements

. Easy flowchart modification

. Autochart symbols or the Flowchart Symbols for Information Processing (X3.5-1966) as approved by the United States of America Standards Institute can be specified

. Unrestricted placement of lines or comments at any location

Programming Systems: The program will operate in conjunction with the IBM Disk Operating System/360 (DOS/360) and is used to produce flowcharts. The source language is DOS/360 Assembly language and uses the EBCDIC character set.

Minimum System Requirements: System/360 Model E30 (32K) with standard instruction set ... two 2311 Disk Storage Drives (one for systems residence and one for work file) ... one 2540 Card Read Punch ... one 1052 Printer-Keyboard ... one 1403 Printer with 132 Print positions using the PN or QN chain arrangement (PL/I).

[Note: If a PN or QN chain is not available, the following delimiter characters may either not print or else print as different characters: Percent (%), colon (:), semi-colon (;) and number sign (#).]

Optional Devices: One 2400 series tape drive for System/360 FLOWCHART language input; one 2400 series tape drive for output.

———————————————————————— Side 1 of 2

Basic Program Material:

Documentation -- Application Directory, Users Manual H20-0293, and Operator's Manual H20-0294.

If only the form numbered manuals (basic documentation) supporting this program are required, they should be ordered through the normal publication distribution channels and not from PID*.

Machine Readable -- Consisting of object modules, sample catalog control cards, job control cards, and sample problem cards may be obtained in card form or on one 9-track or 7-track (Data Conversion feature required) DTR.

If not specified, a 9-track DTR will be forwarded. The DTR will be supplied by PID; no tape submittal is required.

Optional Program Material:

Documentation -- Systems Manual Y20-0062

Machine Readable -- Source cards, assembly listings and flowcharts may be ordered on one 9- or 7-track (Data Conversion feature required) tape. One 800 bpi 2400' reel of tape must be submitted to PID for this material.

Reference Material: Application Description (H20-0199-1)*.

Please contact Systems Marketing Techniques Development, DPD HQ, for further information.

*Do not order from Mechanicsburg until availability is announced in a PRL.

|C| IBM System/360 Demand Deposit Accounting

1412 MICR Reader-Sorter

Programming Announcement Letter P66-103 released the DDA program 360A-FB-15X and stated that a problem existed in operating the programs with the IBM 1412 MICR Reader-Sorter. The correction to this problem will be available in March 1967.

Until this correction is made available, you are advised of the following requirement for program support of the 1412. The user must operate without programmed self-checking of account number. However, should self-checking be required by the user, the 1412 must be equipped with the self-check special feature #7061 for Modulus 10 technique or #7062 for Modulus 11 technique.

Disk Availability

The program, currently available on magnetic tape, is now also available on disk pack.

Submitted disks must be IBM 1316 Disk Packs, vented hub model. One disk pack per order is required.

All other information in P66-103 is still in effect.

John Fahey
Director of DP Marketing

[A]   IBM System/360 Mathematical Programming System

The Linear Programming capability of Mathematical Programming System/360 (360A-CO-14X) may now be ordered. Shipments will begin the week ending January 6, 1967. MPS combines the best features of current IBM linear programming systems plus significant new capabilities such as:

- A dynamic storage allocation algorithm to utilize the System/360 memory and input/output devices most efficiently during problem solution.

- An improved inversion technique which improves accuracy and reduces solution time.

- A maximum problem size of 4,095 rows.

Description: Linear Programming is a Mathematical Programming technique for determining the optimum solution to a system of linear inequalities. This solution may be an optimum allocation of resources (capital, raw materials, manpower, etc.) to specified activities (investments, products, jobs) to obtain a particular objective (minimum expense, maximum profit) when there are alternate uses for these resources. Linear programming plays an important role in such areas as materials allocation, ingredient blending, (feed, flour, gasoline, etc.), production scheduling, distribution, and shipping.

Use: This programming system operates under control of the IBM Operating System/360. It consists of a number of routines called procedures, stored on the Program Library Residence device of Operating System/360. Only those procedures currently being executed are brought into main storage. The particular procedures to be executed are under the supervision of a control program prepared by the user. This control program is composed of statements which specify to the system the desired procedures to be executed. The sequence of these statements defines a solution strategy for solving a particular linear programming problem.

Features:

- The system utilizes the Revised Simplex Method (product form of inverse) with bounded variables and range constraints.

- A highly efficient inversion technique using a triangularization method permits inversions to be made frequently, thus increasing the speed of succeeding iterations and maintaining a high degree of accuracy.

- A multiple pricing method, adjusted for problem size and amount of available storage, reduces the amount of file processing and increases solution speed.

- Dynamic storage allocation provides for maximum utilization of available System/360 components.

- Maximum problem size is 4,095 rows.

- Conditional control statements permit alternate solution strategies to be implemented depending upon the conditions which arise during solution.

- Interrupt facilities provide the means for pre-planning alternate strategies in the event of off-normal conditions.

- Simultaneous parametric programming on both the righthand side and objective function may be utilized.

- Parametric programming on matrix rows or columns.

- Modular design makes it easy to add, modify, replace or delete functions as new requirements develop.

- Provision for converting input data from the 7040/44, 1620 - 1311, and 1400 - 1311 Linear Programming Systems is provided.

Programming Systems: OS/360, Release 7. MPS/360 is written in the OS/360 Assembler language. It uses the BSAM and EXCP Data Access Methods of OS/360.

Machine Configuration: MPS/360 requires a S/360 with at least 65,536 bytes, the Standard and Decimal instruction sets, the Floating Point option, and, if the system output is a printer, it must have 132 print positions (a minimum of 44K bytes must be available for MPS/360

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——— Published by DP Sales Publishing Services, WTHQ ———

program and data storage). This version of MPS/360 supports the 2400 Series Magnetic Tape Units Models 1, 2, and 3 and the 2311 Disk Storage Drive.

The problem size (number of rows) which MPS/360 solves is directly dependent upon the size of memory available for data. The total amount of core storage used by MPS/360 is divided into two parts, program storage and data storage. The size of the MPS/360 program is approximately 29,800 bytes with a slight variation because of the number and type of I/O devices used to solve a given problem. The amount of storage available for data varies depending on the following factors:

- S/360 CPU size

- Size of resident OS/360

- In a multi-task operating system, the size of core currently being used by other tasks

- The user-specified amount of data core available to MPS/360 for the current run

The design of MPS/360 allows the user to solve problems much larger than the designed norm (to be defined later), but with a reduction of efficiency. This conscious design goal of the system allows the user to solve "in house" those few problems which exceed his normal requirements. However, it is recommended that the System/360 CPU size be selected using the designed norm problem size rather than the maximum problem size.

The number of data storage bytes available to MPS/360 may be obtained by subtracting from the S/360 CPU size:

a. Size of resident OS/360

b. Amount of core, if any, being currently used by other tasks

c. 29,800 (approximate program size of MPS/360)

Figure 1 represents the maximum and the designed norm problem size which may be solved with the indicated number of data bytes. The Application Description Manual (H20-0136-1) provides the equations necessary to evaluate the maximum problem for a given number of data bytes. MPS/360 requires a minimum number of utility files for the permanent and temporary storage of data. However, if available and specified by the user, the system will utilize a set of optional files to provide additional flexibility or more efficient problem solution. A file is a collection of related data stored and retrieved in a sequential fashion. A file may be stored on a part of a direct access device (2311) or a single reel of tape. Figure 2 contains the files required by MPS/360.

Note the system input, output, punch and system residence file have been excluded from this table. Figure 3 contains the optional files which if present will be utilized by MPS/360.

FIGURE 1

Bytes Rows	17,300	82,500	213,000	475,000	992,000
Maximum	305	2,120	4,095	4,095	4,095
Designed Norm	≤ 200	200-700	700 - 1600	1600 - 3500	$\leq 4,095$

"Designed Norm" is the problem size MPS/360 was designed to solve normally on the specified number of data bytes.

FIGURE 2

File Name	Description
SYSMLCP [1]	Contains the machine language control produced by the compiler.
MATRIX1 [3]	Contains, in internal form, the LP matrix
ETA1 [2]	Contains, in internal form, the product form of the inverse
SCRATCH1 [3]	Used for temporary data storage
SCRATCH2 [3]	Used for temporary data storage
PROBFILE [2]	Contains a machine independent representation of the LP model

FIGURE 3

File Name	Description
OLDPFILE [2]	Contains a machine independent representation of a problem which is to be REVISEd or COPYed.
MATRIX2-4 [3]	Up to four devices may be specified for the storage of the LP model (they should be on separate channels)
ETA 2-4 [3]	Up to four devices may be specified for the storage of the product form of the inverse (they should be on separate channels)
MPSCRAT [1]	Used by the post-optimal procedures when only 4 work regions (minimum) have been SETUP.
SYSABS	A high-speed printer which may be used to monitor the LP solution.

(1) - Must be a direct access device.
(2) - If 2400 series tape unit, it must be 9-track.
(3) - If 2400 series tape unit and 7-track, it must have Data Convert feature.

Basic Program Material:

Documentation -- Application Directory, Control Language Users Manual (H20-0290), Linear Programming Users Manual (H29-0291).

If only the form numbered manuals supporting this program are required, order them from the IBM Distribution Center in Mechanicsburg.

Machine Readable Material -- The relocatable load modules, message descriptions and sample problem deck may be obtained on one reel of 9-track tape or one reel of 7-track tape (Data Conversion feature required) or one IBM 1316 Disk Pack. Each of of these volumes will also contain the optional source card images.

Optional Program Material: Consists of one 9-track tape containing program flowcharts and one 9-track DTR (DTR will be supplied by PID; no tape submittal is required) containing a flowchart print program.

Note: Application Description Manual (H20-0136-1) and Systems Manual (Y20-0065)* may be obtained only from the IBM Distribution Center in Mechanicsburg.

Reference Material: "Introduction to Linear Programming" (E20-8171) ... Application Manuals -- "Aluminum Alloy Blending" (E20-0127), "Electric Arc Furnace Steelmaking" (E20-0147), "Feed Manufacturing" (E20-0148), "Ice Cream Blending" (E20-0156), "Blast Furnace Burdening" (E20-0160), "Cotton Blending" (E20-0164), and "Gasoline Blending" (E20-0168).

Note: The MARVEL Language Processor portion of MPS availability will be announced in a subsequent letter.

For further information please contact your Regional Manager of Scientific Marketing Manager.

[B] Remote Access Computing System (RAX) for System/360

Additional information on the Remote Access Computing System (RAX, previously referred to as RACS in P66-40) is now available. This announcement provides:

1. Details of announced and new RAX capabilities

2. Configuration specifications

3. The availability of the RAX System Description Manual

The RAX program will be available in June 1967.

P66-40 is now superseded by this announcement. Additionally, the maximum number of 1050 Data Communications Terminals that may be attached to the minimum system (64K) will be 10 instead of 14 previously announced. All customers affected by this change should be notified immediately.

Description: RAX is a time shared, remote computing system for System/360 Models 30, 40, and 50 with standard features. Compilation and time-sliced execution is provided for BPS FORTRAN IV and Basic Assembler Language jobs from remote terminals simultaneously with similar operations at the computer site.

Features: The following significant capabilities are available with RAX:

. A maximum of 63 terminals can be used with RAX. This allows any combination of up to 60 - 1050 Data Communications Terminals and up to 8 - 2260 Display Stations to make up the total of 63. A 256K byte memory (Processing Unit Model H) is required to support the maximum number of terminals.

. /SAVE and /PURGE terminal commands will reference programs by name and security lock code. This will allow for usage of library programs by reference to its name, with unauthorized deletion or modification prevented by the security code.

. A restart capability will provide for automatic resumption of a job after recovery from systems error. Indication of the last input line accepted and a repeat of some output lines will occur.

. The 2260 Display Stations will allow entry of up to 12 lines at one time into the system. Updating on the 2260 will feature an eight line per page display through the program with alterations allowed on the original 8 lines and additions made in lines 9-12.

. Three memory configurations on System/360 will be supported. They are the minimum 64K, the 128K, and the maximum sized 256K byte configurations.

. . Object program execution storage will be 28K bytes for the minimum memory system and 64K bytes for the 128K and 256K byte systems.

. By means of the /INCLUDE terminal command a user will be able to insert into his job stream at compile time a previously stored data or source program module.

. To highlight the man machine interactive nature of modern computing techniques used in RAX the system will now allow conversational interaction between the user and application program at execution time by addressing the terminal as an input/output unit.

. Program storage will be efficiently contained on up to 7 library disk files.

. Basic Assembler Language jobs can now be entered and executed from the terminals as well as from the card reader, however, all input/output must be done in FORTRAN. Execution of privileged user instructions will not be allowed by RAX.

. A /DISPLAY command will allow total or partial review of a user's input or library files.

Use: Sustained access to a System/360 from remote locations enables engineers, scientists, and other users to realize fast turnaround and reduced problem-solution time for their computational problems. FORTRAN programmers can compile, modify, and execute programs from their remote terminals, while non-computer oriented users are using programs previously saved in the RAX library. Familiarity with the RAX terminal command language and the operation of his terminal device enable the user to exploit the computational power of the System/360.

Customer Responsibilities: A customer using RAX must take the following steps prior to installation to insure that the use of the system will be satisfactory.

1. The customer must be responsible for ordering and installing satisfactorily all the communications equipment required.

2. Appropriate training must be given to users on the terminal command language, the programming languages, and terminal operations.

3. It is desirable that a systems programmer become familiar with the internal operations of the system. This knowledge will increase customer satisfaction in the environment of a complex time sharing and remote computing terminal system.

Sales Information: Most System/360 Model 30, 40, or 50 customers and prospects are potential prospects for RAX.

. RAX can constitute the entire justification for a system in engineering research firms, in universities, or in engineering departments of large firms.

. RAX provides justification for upgrading and adding equipment for customers who want to provide access to a computing service for their scientific and technical personnel.

RAX enables IBM customers to acquaint themselves with remote computing time-sharing systems. A small additional investment permits batch-oriented installations to evaluate the benefits of this emerging system concept for their own operations.

Programming System: RAX is written in BPS Basic Assembler Language.

Minimum Machine Requirements: System/360 Model 30F with one Selector Channel, Interval Timer, Storage Protection, Decimal Arithmetic, Floating Point Arithmetic features; 1052 Printer-Keyboard Model 8 as a system console, 2540 Card Read Punch, 1403 Printer Model 2, 3, 7, or N1, two 2311 Disk Storage Drives; for attaching 1050 Data Communication Terminals EITHER a 2702 Transmission Control with Terminal Control - Type I (#4615), Selective Speed (#9684), and appropriate line adapters OR a 2701 Data Adapter Unit with Terminal Adapter - Type I (#4645 or 4646) and appropriate line adapter for each line (up to 4). Up to 10 - 1050 Data Communication Terminals may be attached to the minimum configuration.

Systems Generation: Distribution of the RAX program will be on tape. RAX users must have access to a tape configuration on which to punch the object and source program decks.

1050 Terminal Configuration: The minimum IBM 1050 Data Communication Terminal consists of: one IBM 1051 Control Unit Model 2 with the First Printer Attachment feature (#4408), and one IBM 1052 Printer-Keyboard Model 2. The 1052 Printing Element used by RAX is Data I font (#9575 or #9576). The following table of special features for the various 1050 components indicates features that can be used with RAX (Code A); features that can be attached but are not utilized by the system (Code B); and features that must not be attached to a RAX terminal (Code C). Features required if the component is present are indicated by code AR.

1051 Control Unit (Model 1 or 2 only)

	Feature	Code
Card Punch Attach.	1635	B
1st Printer Attach.	4408	AR
1st Punch Attach.	4410	B
1st Reader Attach.	4411	A
2nd Printer Attach.	6381	B
2nd Punch Attach.	6383	B
2nd Reader Attach.	6384	B
Auto Fill Char. Gen.	1287	B
Auto Ribbon Shift & Line Feed Select	1295	B
Audible Alarm	1307	B
Automatic EOB	1313	B
CPU Attachment	3130	C
Forms Stand Stacker	4450	B
1447 Attachment	4461	C
Home Comp. Recgntn.	4605	B
Home Correction	4607	B
Home Loop Input Component Intlk.	4606	B
IBM Line Adapters	(4647, 4691, 4692, 4693, 4694, 4790)	A

	Feature	Code
I/O Comp Table	4632	B
Keyboard Request	4770	C
Line Correction	4795	B
Line Cor. Release	4796	B
Master Station	5050	B
Open Line Detection	5465	B
Reader Stop Prefix J	6060	B
Switch Unit	7660, 7661	C
Tel Line Attach	7835	C
Vertical Forms Control	8715	B

1052 Printer-Keyboard (Model 1 or 2 only)   A

	Feature	Code
Accelerated Carrier Return	1006	B
Auto EOB	1313	B
Forms Feed Control	4452	B
Home Loop Input Component Interlock	4606	B
Open Line Detection	5465	B

1053 Printer, Model 1   B

1054 Paper Tape Reader, Model 1   A

	Feature	Code
Edge-punch Read	3570	C
Reels, Center Roll Reel and Take-up	6120	B
Telegraph Speed	7910	C

1055 Paper Tape Punch, Model 1   B

1056 Card Reader, Model 1 (recommended)

	Feature	Code
Card Reader Program	1640	B
Extd. Character Reading	3861	AR
Feed, 51 Col Card	4004	C
Feed, Short Card Pack	4006	C
High Speed Skip	4595	B
Telegraph Speed	7910	C

1057 Card Punch, Model 1   B

1058 Printing Card Punch, Model 1   B

	Feature	Code
Extd Character Punch	3860	B
Operator Panel	5478	C

For systems larger than 64K, support is provided for IBM 1050 Data Communication Terminals and/or 2260 Display Stations. Additionally, work file capability and expanded program save features are available with the larger configurations. The IBM 2260 Display Station must have an Alphameric Keyboard feature and be connected to a directly attached 2848 Display Control Model 3 with the Non-Destructive Cursor feature. One 2848 Model 3 with up to eight 2260 Display Stations is supported.

The 128K byte core system (Processing unit model G) will support a maximum of 30 - 1050s and 2 - 2260s. A tradeoff on core storage will allow one 2260 to replace 3 - 1050s and vice versa. For purposes of calculating the mix of terminal lines entering the system, 600 bytes of memory are required for each 1050 terminal and 1800 bytes per 2260 terminal after the basic I/O routines are incorporated.

Maximum Support Configuration: System/360 Model 50H with 2 selector channels, Interval Timer, Storage Protection, Decimal Arithmetic, Floating Point Arithmetic, 1052 Printer-Keyboard Model 7, 2540 Card Read Punch, 1403 Printer Model 2, 3, 7 or N1, 8 - 2311 Disk Storage Drives, 2 - 2702 Transmission Controls, 60 - 1050 Data Communications Terminals, 1 - 2848 Model 3 Display Control with Non-Destructive Cursor feature and 8 - 2260 Display Stations with the Alphameric keyboard feature (with a maximum of 63 - 1050's and 2260's combined), 4 - 2400 tape drives.

Reference Material: RAX System Description Manual (H20-0266-0)... IBM System/360 Basic Programming Support FORTRAN IV, C28-6629, and BPS Basic Assembler Language, C28-6503, describe the languages implemented under RAX.

For further information contact your Regional Manager of Scientific Marketing.

John Fahey
Director of DP Marketing

[A] IBM 1130 Civil Engineering Coordinate Geometry (COGO)

1130 COGO (1130-EC-02X) may now be ordered. Shipment will begin the week ending January 13, 1967. The Local Origin option in 1130 COGO is temporarily restricted and should not be used. The availability date for use of this option will be announced January 1967. COGO is a simple, efficient tool designed especially to assist the civil engineer with a wide variety of geometric calculations. With COGO, the engineer can state his problems using familiar terminology common to the engineering field. No knowledge of traditional programming is necessary.

Description: The civil engineer requires a simple but efficient means to solve geometric problems now being done laboriously by hand. 1130 COGO provides the solution to his problem by allowing the engineer to enter the data for the job into the computer by typewriter or punched card in a language he is familiar with, and to have solutions automatically printed out for him. COGO is especially useful because it provides the facility for the engineer to try many different methods of solving a problem.

COGO can be used for many different types of jobs, e.g., control surveys, highway design, right of way surveys, bridge geometry, subdivision calculations, land surveying, construction layout.

COGO can, in fact, be used wherever geometric calculation is required.

Features: 1130 COGO is a new, powerful and versatile coordinate geometry program modeled after and encompassing the capabilities of 1620 COGO. Some 1620 customer written COGO programs now in use may require modifications to run on the 1130 system since some 1620 COGO commands have been deleted. The following new features have been added to 1130 COGO:

- . Commands to process spirals
- . Commands to process vertical geometry
- . Reference to distances, angles and azimuth by specifying point numbers
- . 999 points may be stored vs. 99 in 1620 COGO I-D

Sales Information: Prospects can get fast computer solutions to civil engineering geometry problems without computer training. Anyone with a civil engineering background can learn to use COGO in just a few hours. The engineer states his problem to the 1130 almost as if discussing it with another engineer. The 1130 puts computing power at his fingertips.

COGO opens up whole new selling opportunities. The Public Works Department in a city or county is a prospect, regardless of size. Civil engineering consulting firms, public utilities, steel fabricators, and state highway district offices are others.

Use: To use 1130 COGO, the engineer writes a description of the problem and the method to be used to solve it. No special forms are required. The problem may be stated on any piece of paper or a surveying field book. The data is punched into cards in free form for entry into the 1130, or entered directly from the console typewriter. The programming system provides the engineer with direct communication with the 1130 for the most complete use of his judgment, experience, and imagination in solving each problem.

Customer Responsibilities: All that is required is that the customer be familiar with the 1130 COGO language. The COGO program is ready to run as distributed. The customer need only load the cards onto a disk. COGO is written in FORTRAN and if the user wishes to add any of his own special subroutines he may do so with a minimum of effort.

Programming Systems: COGO is written in 1130 FORTRAN and runs under the 1130 Disk Monitor System.

Minimum System Requirements: A card-oriented 8K 1130 Model 2 (with disk). The addition of an 1132 Printer will increase the speed of the system but is not required.

Basic Program Material:

Documentation - User's Manual (H20-0301)*, Application Directory

Machine Readable - Object Card Decks and Sample Program Deck will be distributed in card form.

*If only the form numbered manuals supporting this program are required, order them from Mechanicsburg, not PID.

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Optional Program Material:

Machine Readable - Source Cards on Tape (9-track DTR). No tape submittal is required; DTRs will be supplied by PID.

Reference Material: System Manual (Y20-0064)* ... Application Description Manual (H20-0143-3).*

For further information contact your Regional Manager of Scientific Marketing.

*Do not order until availability is announced in a PRL.

[B] IBM 1130 Scientific Subroutine Package

The IBM Scientific Subroutine Package (1130-CM-02X) can now operate under both the IBM 1130 FORTRAN Compliers (1130-OS-001 and 1130-FO-001). PID is not sending a notice of this additional capability to registered program users.

This program was previously released in August 1966 for operation under the IBM 1130 Disk Monitor FORTRAN Compiler (1130-OS-001) only.

Note: A programmer's note will accompany the transmittal letter to future program recipients to advise them of a malfunction which occurs under certain circumstances when SSP/1130 is used with the Card FORTRAN Compiler, 1130-FO-001. The two SSP/1130 sample problems which encounter this error operate correctly with the 1130 Disk Monitor. Work is continuing to isolate and remove the difficulty.

This announcement supersedes P66-76, and changes to it are bracketed.

SSP/1130 contains all of the subroutines presently available in SSP/360 (360A-CM-03X). It replaces the 1130 MATHPAK and will perform all of the computational functions originally specified in 1130 MATHPAK Announcement (P65-5).

Description: 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 polynomial evaluation ... elliptic, exponential, sine, co-sine, Fresnel integrals ... finding real roots of a given function ... finding real and complex roots of real polynomial equations ... poly-nomial 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.

Use: As a library of subroutines, SSP/1130 allows the user to select those functions which he needs, while not being burdened with unneeded routines.

Programming Systems: The subroutines will compile and execute with the IBM 1130 Disk Monitor FORTRAN Compiler (1130-OS-001) and ⌈the IBM 1130 Card FORTRAN Compiler (1130-FO-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 I/O 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 using 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 de-ciding 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 pro-gram, 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.

Special Sales Information: The slide presentation (V20-0120) for SSP/360 (360A-CM-03X) may be useful in selected sales situations. It should be noted that although the calling sequences of the subroutines are identical to those in SSP/360, there have been some modifications to the subroutines and sample programs. The difference in integer word length of the IBM 1130 and System/360 FORTRANs affects SSP subroutines RANDU and GAUSS.

In SSP/360, 2^{29} random numbers are produced by RANDU before the cycle repeats. In SSP/1130, this figure is 2^{13}. Because GAUSS uses RANDU, GAUSS also has a shorter cycle length. The sample programs for SSP/1130 have different I/O and FORMAT statements. In addition, the maximum data capacity has been reduced to fit into the 1130's 8K words of core.

Basic Program Material:

Documentation -- Application Directory, Application Description (H20-0225), Programmer's Manual (H20-0252).

Machine Readable -- Source program cards and sample program cards.

Optional Program Material: Systems Manual containing flowcharts for all subroutines in the package.

Reference Material: IBM 1130 FORTRAN Language (C26-5933).

For further information contact your Regional Manager of Scientific Marketing.

John Fahey
Director of DP Marketing

[A] IBM System/360 Model 50 1410/7010 Emulator Prgm

Version 2 of the 1410/7010 Emulator Program, 360C-EU-726, for the System/360 Model 50 is now available. It obsoletes Version 1, and provides the following improvements:

Support of 2400-Series Models 4, 5, and 6, and 2415 Models 1-6

In addition to the previously supported tape units and controls, the Emulator Program now supports use of the 2401 and 2402 Magnetic Tape Units, Models 4, 5, and 6; 2403 Magnetic Tape Unit and Control, Models 4, 5, and 6; and 2415 Magnetic Tape Unit and Control, Models 1-6, for emulation of 729 tape drives.

Support of 2501 Card Reader and 2520 Card Read Punch

In addition to the previously supported card reading equipment, the Emulator now supports the 2501 Card Reader, Models B1 and B2, and the 2520 Card Read Punch, Model B1, for emulation of the 1442 Card Read Punch.

Disk Residence

Users now have the option of writing the Emulator Program, as a loadable file, on 2302 Disk Storage or on a 2311 Disk Storage Drive.

The 1410/7010 Emulator Program is a stand-alone program which, with the 1410/7010 Compatibility feature (#4478), executes 1410/7010 programs on a System/360 Model 50. The Emulator Program is an interpreter simulator that uses both standard System/360 instructions and special instructions provided by the Compatibility Feature. Combined, the Emulator Program and the Compatibility Feature are referred to as an Emulator. Currently operating non-time-dependent 1410/7010 programs can be executed by the Emulator without modification, although certain special and custom features are not emulated.

By eliminating the requirement to convert all 1410/7010 programs before installing System/360, the Emulator allows the user to apply most of his programming resources towards developing new applications and redesigning existing applications to take full advantage of System/360 facilities. Use of the Emulator also allows immediate production runs upon installation, allows time for user education in System/360 concepts, and eases the pressure of program testing.

The average internal speed of the Emulator (excluding I/O and Edit Instructions) is approximately 3 times that of the 1410. Throughput performance depends on the mixture of instructions and the comparative performance of I/O devices. With equivalent I/O devices, throughput for most jobs which are not I/O bound will be approximately that of the 7010 system or up to 2 times 1410 system throughput; I/O bound jobs will run at approximately the same speed as on the emulated system. Timing information which may be used to estimate throughput is presented in the SRL publication, System/360 Conversion Aids: The 1410/7010 Emulator Program for System/360 Model 50, C28-6568.

Note: The specified performance can be attained for disk systems only if EC413140 is installed on 2841 Storage Control Units. Throughput with lower level 2841's may be reduced by as much as two-thirds.

The basic 1410/7010 configuration being emulated may include ten disk modules on each of three channels, ten tape units on each of three channels, unit record equipment on channel 1, and the 1415 Console Printer. The Emulator appears to the 1410/7010 program as a 1410/7010 of any standard memory size with the following features: 1410/7010 Processing Overlap and Priority Processing ... 1410 Dual Synchronizer Adapter ... 7010 Second and Third Channels and Store and Restore Status Instructions.

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In addition to the 1410/7010 Compatibility Feature (#4478), the System/360 requirements are:

. Model 50F for up to 40,000 positions of 1410/7010 core storage, or

. Model 50G or larger for up to 100,000 positions of 1410/7010 core storage.

. One 1052 Printer-Keyboard, Model 7, and 1052 Adapter (#7920).

. One program-load device which may be any of the following:

    . 2540 Card Read Punch
    . 1442 N1 Card Read Punch
    . 2501 B1 or B2 Card Reader
    . 2520 B1 Card Read Punch
    . 2400-series Magnetic Tape Unit
    . 2302 Disk Storage
    . 2311 Disk Storage Drive

The program is available in card-image form on a 7- or 9-track Distribution Tape Reel. Loading of the Emulator Program, as distributed by PID, must be from card or tape. Subsequent loading can be from card, tape, or disk.

If the Emulator Program is to be loaded from a magnetic tape unit equipped with the 7-track Read-Write Head (#9557), the 7-track Compatibility Feature (#7125, #7126, #7127), and the Data Conversion feature (#3228 or #3236) must be installed on the associated Tape Control Unit. After the Emulator Program has been loaded, the load device, except for the 2311, is available as a 1410/7010 corresponding device. (See below).

Input/Output Unit Correspondence is as follows:

1410/7010 I/O Units	Equivalent System/360 Mdl 50 I/O Units
1402 Card Read Punch Model 2*	2540 Card Read Punch
1442 Card Reader, Mdl 3*	1442 Card Read Punch, Mdl N1 2501 Card Reader, Mdl B1 or B2 2520 Card Read Punch, Mdl B1
1403 Printer, Mdl 1, 2, or 3*	1403 Printer, Mdl 2 or N1 1404 Printer, Mdl 2
729 II, IV, V, and VI Magnetic Tape Units * (See side 2)	2401, 2402, 2403, or 2415 Magnetic Tape Units, Mdls 1,2 3, 4, 5, or 6, or 2404 Tape Units, Mdls 1, 2, or 3; 7- or 9-track
7330 Magnetic Tape Unit	Same as for the 729 Magnetic Tape Units
1415 Console Printer	1052 Printer-Keyboard, Mdl 7 with printing element #9572
1301 Disk Storage Model Correspondence as follows:	2302 Disk Storage
Two Model 1	One Model 3
One Model 2	One Model 3
Four Model 1	One Model 4
Two Model 2	One Model 4
Two Model 1 and one Model 2	One Model 4

———————————————————————————————Side 1 of 2

Emulated punched card data processing equipment must previously have been assigned to 1410/7010 Channel 1.

Input/Output Feature Correspondence is as follows:

1410/7010 Feature	Model 50 Feature
1402 51-column Interchangeable Read Feed, feature #1013, #4150	2540 51-column Interchangeable Read Feed, feature #4151

Reference Material: The following reference publications are available through the IBM Branch Office -- System/360 Conversion Aids: The 1410/7010 Emulator Program for System/360 Model 50 Program Logic Manual Program, 360C-EU-726 and TNL Y27-7125 ... System/360 System Summary, A22-6810 ... System/360 Principles of Operation, A22-6821 ... System/360 Basic Programming Support, Basic Utilities, C28-6505 ... System/360 Operating System: Utilities, C28-6586 ... 1410 Principles of Operation, A22-0526 ... 7010 Principles of Operation, A22-6726.

Engineering Change Levels: The following EC levels are required for proper functioning of the System/360 Mdl 50 1410/7010 Emulator Program -- EC 257246 on the 1410/7010 Compatibility Feature ... EC 730966 and 730969 on the 2803 Tape Control Unit Mdl 2 ... EC 730966 on the 2403 Tape Control Units Mdls 4, 5, and 6 ... and EC 730969 on the 2804 Tape Control Unit Mdl 2.

Note: Installations that require any of these Requests for Engineering Actions should notify Field Engineering Technical Operations, Poughkeepsie, New York.

Basic Program Material

Documentation -- Program Material List ... Sample Problem Operating Instructions.

SRL Publications -- System/360 Basic Programming Support, Operating Guide for Basic Assembler and Utilities, C28-6557-3 ... System/360 Model 50, Emulation of the 1410/7010 Data Processing System, C28-6568-1, and TNL N27-1245.

If only the form numbered manuals are required, order them through the IBM Distribution Center, Mechanicsburg -- not from PID.

Machine Readable -- Absolute Loader, Emulator Object Deck, Sample Problem and Disk Loader available on one 9-track or one 7-track DTR (Data Conversion feature required).

Current users will not receive the new version automatically. Instead, they will receive a prepunched program order card and a letter announcing the new version and instructing them to order it through the branch office.

DTRs are supplied by PID -- no tape submittal is required.

[B] System/360 Model 20 Basic Trace (12K)

System/360 Model 20 Basic Trace (12K) (Version 1, Modification Level 2), 360T-UT-107, is available. It is an addition to the Model 20 Basic Utility programs and deviates from the following programs,

360T-UT-103 Basic Trace (4K)
360T-UT-104 Basic Trace (8K)
360T-UT-105 Basic Trace (16K)

only with respect to the point of origin in core.

Basic Program Material

Documentation -- Program Material List.

SRL Publications -- System/360 Model 20, Basic Utility Programs, Functions and Operating Procedures, C26-3604-2, and a TNL N24-9012.

If only the form numbered manuals are required, order them through the IBM Distribution Center, Mechanicsburg -- not from PID.

Machine Readable -- Object Deck and Sample Deck available in card form.

[C] System/360 Model 20 Universal Character Set

System/360 Model 20 Universal Character Set - Utility Program, 360T-UT-108, is available. It provides for loading the 240-byte UCS buffer with any 8-bit codes that are to correspond to the 240 graphic positions on the printer chain/train.

Use: The user furnishes the utility program with specification cards, four of which contain the 240 characters to be loaded into the UCS buffer.

Features: The UCS Utility Program is a stand-alone program. It supports the folding and dualing capability. After the buffer has been loaded, a set of lines representing the chain/train image is printed. This allows visual verification that the chain or train graphics, and their positions, match the desired character codes.

Performance Data: To load and execute the program takes less than one minute.

Minimum System and EC Level Requirements: A Processing Unit 2020 Model B2 (EC Level at least 12100), with Universal Character Set ... Adapter ... A Card Reader (2501 Model A1 or A2, 2520 Model A1 or 2560 Model A1) ... A Printer 1403 Model 2 or N1 with Universal Character Set feature.

Reference Material: SRL Publications -- System/360 Model 20 Functional Characteristics, A26-5847-1 and TNLs N26-0145, N26-0149 ... 1403 Printer, A24-3073-3.

Basic Program Material

Documentation -- Program Material List.

SRL Publications -- System/360 Model 20 Universal Character Set Utility Program, C26-3812-1.

If only the form numbered manuals are required, order them through the IBM Distribution Center, Mechanicsburg -- not from PID.

Machine Readable -- Object Deck available in card form.

John Fahey
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